

VANDERBILT  UNIVERSITY
MEDICAL CENTER

Center for Programs in Allied Health
Neurodiagnostic Technology Program



Program Handbook
2019-2020

Updated: April 29, 2019

INTRODUCTION TO PROGRAM HANDBOOK

The purpose of the Program Handbook is to serve as a reference and resource for the students in each of the programs in the VUMC Center for Programs in Allied Health (CPiAH). The Program Handbook is one of the important documents that provide operational guidance to students, to assist them in their successful progression through their programs. Other key documents with policy and procedure information important to students include:

- Catalog of the VUMC Center for Programs in Allied Health – Source of important policies and other information related to VUMC, the CPiAH and each program. The catalog is available on the VUMC CPiAH website.
- Program Handbook – Each CPiAH program provides students its own Program Handbook. The policies and procedures in the Program Handbook are aligned with VUMC, CPiAH and program policies that appear in the Catalog, as well as other locations. The purpose of the Program Handbook is to provide more specific details about each program, with a particular focus on operational information and procedures.
- VUMC CPiAH website and Program Website – The Center for Programs in Allied Health has its own website, and that website houses a website for each program within the CPiAH. Students will find important information regarding both the institution and the programs on these sites.

IMPORTANT NOTICE TO STUDENTS:

All students enrolled in VUMC Center for Programs in Allied Health (CPiAH) programs are bound by all VUMC, CPiAH and Program policies. By enrolling in a CPiAH program, every student acknowledges his or her responsibility to abide by and adhere to all institutional and programmatic policies and procedures. Students therefore have the responsibility of being familiar with the policies and procedures described in the Program Handbook, in the Catalog of the Center for Programs in Allied Health, and on the CPiAH and respective program's websites.

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IMPORTANT PROGRAM INFORMATION PROVIDED IN THE CPIAH CATALOG

The Catalog of the Center for Programs in Allied Health (CPiAH) contains important information about Vanderbilt University Medical Center, the Center for Programs in Allied Health and this program specifically.

Students are advised to refer to the CPiAH Catalog to obtain the following information about this program:

- Program Description
- Certification/Credentialing Information
- Mission, Credo and Goals
- Goals and Objectives
- Staff and Faculty
- Program Accreditation/Approvals
- Graduation Requirements
- Academic Calendar
- Admission Information
- Academic Program
- Course List & Descriptions
- Grading & Satisfactory Academic Progress Requirements
- Professional Code of Ethics
- Program-Specific Technology Requirements

ACADEMIC CALENDAR

First Day of School for Graduating Class of 2021.....	September 3, 2019
Fall Break.....	November 27 – December 3, 2019
Winter Break.....	December 23, 2019 - January 3, 2020
MLK Day.....	January 20, 2020
Graduation for Class of 2020.....	March TBD, 2020
Spring Break.....	April 9 – 13, 2020
Memorial Day.....	May 25, 2018
Independence Day.....	July 2 – 3, 2020
Labor Day.....	September 7, 2020
Thanksgiving Break	November 23 - 27, 2020
Winter Break.....	December 21, 2019 – January 1, 2021
MLK Day.....	January 18, 2021
Graduation for Class of 2021.....	March TBD, 2021

PROGRAM DESCRIPTION

Neurosciences and Neurology at VUMC

Vanderbilt Neurosciences offers a wide range of specialty programs to treat brain, spine or central nervous system disorders. Whether routine care or complex surgery, patients benefit from the expertise of many different specialists focused on providing the best care available. The Neurology team at Vanderbilt University Medical Center (VUMC) offers advanced care to treat brain and nervous system disorders. VUMC neurologists have the expertise to accurately evaluate, diagnose and treat a wide array of symptoms. They work with patients to develop a personalized care plan to meet unique patient needs.

The Neurodiagnostic Program at VUMC

The Neurodiagnostic (NDT) Program at VUMC was originally sponsored by Vanderbilt Neurosciences and graduated its first class in 2012. Following the division of VUMC and Vanderbilt University, the NDT Program remains within VUMC and has been subsumed by the Center for Programs in Allied Health.

Neurodiagnostic Program Objectives

The creators of the NDT Program recognized that a shortage of well-trained electroencephalography (EEG) technologists was a limiting factor in patient access to important tests, diagnosis, and treatment. This program was intended to produce formally educated and experienced EEG technologists who will improve patient care wherever they may be employed and perform EEGs.

NEURODIAGNOSTIC TECHNOLOGY PROGRAM GRADUATE COMPETENCIES

The graduate competencies for performing an electroencephalogram (EEG) and additional neurodiagnostic procedures, including introductory level Evoked Potential Studies (EP), Polysomnography Studies (PSG), Nerve Conduction Studies (NCS), Intraoperative Neurophysiological Monitoring (IONM), and Long Term Monitoring in Epilepsy (LTME) are recommended as standards for the education of post-secondary students in neurodiagnostic technology (NDT) programs. These standards are presented as Appendix A to this handbook. Employers can expect the graduates of CAAHEP- accredited NDT programs to be competent in these areas.

STUDENT CONDUCT / ACADEMIC INTEGRITY

All students are bound by several standards of conduct, as outlined in the CPiAH Catalog, including:

- VUMC Code of Conduct
- VUMC Center for Programs in Allied Health Honor Code
- ASET Statement of Professional Ethics

Adherence to these Codes and the ASET Statement of Professional Ethics is always required of students.

REQUIRED TEXTBOOKS

Title	Author	ISBN/Publisher	Year	Retail Price
Anatomy and Physiology Text	Open Stax College	Creative Commons Attribution	2013	Free Downloadable and included in tuition
Medical Terminology: The Language of Health Care, 2 nd Ed	M.C. Willis	13:978-1451176766 10:1451176767 Lippincott, Williams and Wilkins	2006	\$55.00
Practical Approach to Electroencephalography	M.H. Libenson	13:978-0750674782 10:0750674784 Elsevier, Inc.	2010	\$89.00

DRESS CODE

Students are required to dress in an appropriate professional manner, in keeping with VUMC institutional dress code (Appendix D of the CPiAH Catalog). In addition, NDT Program students are required to adhere to the following attire guidelines:

- The designated brand of scrubs is Wonderwink. The designated color of scrubs is Pewter.
- Jackets, hoodies, sweat shirts and other similar articles are not permitted to be worn over the scrubs while in the classroom, at lecture, or in the clinic.
- The only exception are scrub jackets available from Wonderwink in the designated color Pewter.
- In the event jackets from the scrub line are not available, a student may ask for approval from the Program Director to wear a different style.
- During orientation week, students are instructed on the proper way to wear the uniform.

COMMUNICATION POLICY

Students are encouraged to consult with the Program Director regarding any questions or concerns. Individual advising times are scheduled regularly, but a student should not wait until their scheduled time if in need of assistance.

OUTSIDE EMPLOYMENT

Students may be employed while enrolled in the NDT program, but employment hours must be scheduled outside of NDT program hours. Students are strongly discouraged from working in positions related to the NDT field until they have graduated from the program. Under no circumstance will work performed in a position outside of the program be counted as clinical time.

INCLEMENT WEATHER POLICY

The Program Director may cancel classes on days when the weather is severe and dangerous for travel. Students will be notified by email if this service is available. If students do not receive notification from the program director of classes being cancelled, they should use their own judgment about the safety of travel during inclement weather. If classes have not been officially canceled by the Program Director or

the Director of the Center for Programs in Allied Health, any time missed during inclement weather will be treated as an absence.

Clinical rotations are not cancelled in the event of inclement weather. If a student judges conditions to be unsafe for travel and does not attend clinical rotations, the student will be responsible for making up the missed clinical time.

ATTENDANCE

Students are required to be present during all scheduled classroom hours, mandatory lectures, and assigned clinical rotations.

- Program hours are Monday through Friday for 7 hours each day. For the didactic portion of the program, location and start time is dependent on classroom availability and will vary. During clinical rotations, hours may vary depending on the schedule of the clinics and clinical preceptors.
- Mandatory lectures are scheduled throughout the program. These include (but are not limited to) neuroanatomy lectures, EEG review sessions with physicians, Fellows' Neurophysiology Conferences, and Adult Epilepsy Surgical Conferences.

Roll is taken by program faculty (or designee) for each day of class, laboratory, and mandatory lecture. During clinical rotations, student attendance and timeliness is monitored by clinical preceptors.

Attendance Violation Policy

Students are considered absent when they are not in their assigned location at the scheduled date and time, regardless of the reason. Students are considered late when the student arrives after program faculty (or designee) has taken roll.

- Students are permitted 20 attendance violations during this 18-month program.
- One violation occurs for each day of absence, regardless of whether it is scheduled or unscheduled.
- One violation occurs for each late arrival, regardless of whether it is scheduled or unscheduled.
- If the student exceeds the 20 permitted attendance violations, they will be dismissed from the program.

Scheduled Absence: Students are required to notify the Program Director (or designee) by email no later than 5PM CST if they are going to be absent the following day.

Unscheduled Absence: Failure to notify the Program Director (or designee) in advance of an absence will result in the student incurring an unscheduled absence.

Excessive Unscheduled Absences:

- Students who incur three consecutive days of unscheduled absences will be dismissed from the program.
- Students who incur two or more unscheduled absences (consecutive or not) within a 30-day period will be subject to disciplinary action, up to and including probation or dismissal from the program.

Scheduled Late Arrival: Students are required to notify the Program Director (or designee) by email no later than 5PM CST if they are going to arrive late for any class, lab, lecture, or clinic on the following day.

Unscheduled Late Arrival: Failure to notify the Program Director (or designee) in advance of late arrival will result in the student incurring an unscheduled late arrival.

Excessive Unscheduled Late Arrivals:

- Students who incur three or more unscheduled late arrivals in a 30-day period will be subject to disciplinary action, up to and including probation or dismissal from the program.

Attendance and Tuition Assistance

Attendance policies related to a student's financial aid are independent of the above policies.

STUDENT PERFORMANCE POLICY

NDT Program academic standards:

- 1) The student maintains an average grade of 70% or greater in each didactic course.
- 2) The student achieves a grade of 70% or greater on each exam.
- 3) The student achieves “S” (satisfactory) on each laboratory assessment.
- 4) The student’s behavior (e.g. attendance and appearance) is consistent with program, hospital, and professional standards.

NDT Program clinical standards:

- 1) The student must achieve “S” (satisfactory) on each clinical evaluation.
- 2) The student’s behavior (e.g. following hospital protocols and staff instructions) is consistent with program, hospital, and professional standards.

Monthly Performance Reviews

Each student will meet with the Program Director monthly for performance review. There are two possible outcomes of this performance review:

- 1) The student meets the program standards described above and is in good standing.
Or
- 2) Student performance does not conform to the program standards and the student is no longer in good standing. The student will receive a verbal warning (which is accompanied by email confirmation of the warning). Following the verbal warning, the student is expected to bring their performance to conformity with the performance standard that was identified as inadequate.

Following Verbal Warning

Four weeks after the verbal warning is delivered, the student and Program Director will meet for performance review. There are two possible outcomes of this performance review:

- 1) The student is in conformity with the program standard previously identified as inadequate and the student’s status will be returned to good standing.
Or
- 2) The student is not in conformity with the program standard previously identified as inadequate. The student will receive a written warning, an improvement plan will be assigned, and the student will be placed on probation. The written warning and improvement plan will be signed by the student. During this probation period, there will be weekly mandatory advisement sessions with the Program Director to ensure the improvement plan is being followed. During probation, it is possible that the student will not be able to proceed according to the normal program timeline.

Following written warning and probation

The probation period will end after eight weeks. At the end of probation, the student’s performance will be reviewed. There are three possible outcomes of this performance review.

- 1) The student is in conformity with the program standard that was previously identified as inadequate and the student will return to good standing.
Or

- 2) The student is not in conformity with the program standard previously identified as inadequate, however the student's conduct and progress are considered satisfactory by the Program Director *and* it is possible that the student could graduate on time. The student will receive a final written warning with a second improvement plan and the student's status will become advanced-probation. The final written warning and second improvement plan will be signed by the student. During advanced-probation, weekly mandatory advisement sessions will be held with the Program Director. It is possible the student will not be able to proceed according the normal program timeline.

Or

- 3) The student is not in conformity with the program standard previously identified as inadequate. Also, the student's conduct or progress is considered unsatisfactory by the Program Director *and/or* it is not possible that the student could graduate on time. The student will be dismissed from the program.

Following final written warning and advanced-probation

If a student is placed on advanced-probation the period will last eight weeks, after which a performance review for the student will be held. There are two possible outcomes of this performance review:

- 1) The student is in conformity with the program standard that was previously identified as inadequate and the student will return to good standing.

Or

- 2) The student's performance is not in conformity with the program standard previously identified as inadequate and they will be dismissed from the program.

Additional Circumstances

Modification of the student performance policy:

The student performance policy was crafted with the intent of identifying and providing additional support to students who need assistance in meeting program standards and successfully graduating from the program. This policy is a tool for promoting student success and is not a disciplinary mechanism for addressing major violations of school, hospital, or professional conduct.

Student conduct that interferes with the education of other students, is disruptive to the hospital workplace, endangers a patient, or is otherwise regarded as serious misconduct by the Program Director may result in other forms of discipline, up to and including dismissal.

The Program Director reserves the right to immediately implement other forms of discipline, up to and including dismissal based on the nature of student misconduct.

Multiple Probations:

It is possible that a student will be placed on probation for failing to meet more than one program standard. For example, probation related to academic performance and, later, probation related to clinical performance. These will be treated as two separate probations, and they will require implementation of two separate improvement plans. The probation periods may begin and end on different dates and may have different outcomes regarding the student's standing in the program.

Appeals procedure

- 1) A student who believes that an implemented disciplinary action or change in standing is unjust must submit a written statement of appeal to the Director for the Center for Programs in Allied Health within 5 days of the implementation of the disciplinary action or change in student standing.
- 2) The Director for the Center for Programs in Allied Health will investigate the grievance and render their written decision within 10 days of receiving the student appeal.

AGREEMENT CONCERNING PROFESSIONAL SOCIETY & NATIONAL CERTIFICATION

American Society of Neurodiagnostic Technologists

I understand that ASET represents an important component of my education and that as a student in the VUMC Neurodiagnostic Technology Program I will be expected to maintain a student membership status. Student membership is \$50 per year and I will be required to join and pay my dues by November 30, 2017 for the year 2018. Dues for 2019 will be due in November 2018. These dues are considered to be part of the lab fees discussed during the initial interview.

Printed Name

Signature

American Board of Registration of EEG and EP Technologists

I understand that the goal of the VUMC NDT Program is to educate students who will be eligible upon graduation for the ABRET EEG registry exam. Graduates of the VUMC NDT program are eligible for the exam under Pathway I immediately following graduation. The cost of the exam is currently 700\$. Paying for and applying to take the exam are my responsibility.

Printed Name

Signature

VANDERBILT UNIVERSITY MEDICAL CENTER

PHYSICAL REQUIREMENTS & ENVIRONMENTAL CONDITIONS

Physical Requirements Group: Physical Requirements Group 57

Physical Requirements Website: <https://hr.mc.vanderbilt.edu/careers/requirements/Group57.pdf>

Strengths Needed: This job is considered in the "Light Work" category requiring exertion up to 20 lbs. of force occasionally and uses negligible amounts of force to move objects.

Category	Physical Requirement	Frequency	Description
Movement	Sitting:	Frequent	Remaining in seated position.
Movement	Standing:	Frequent	Remaining on one's feet without moving.
Movement	Walking:	Occasional	Moving about on foot.
Movement	Lifting under 35 lbs:	Frequent	Raising and lowering objects under 35 lbs from one level to another.
Movement	Lifting over 35 lbs:	Occasional	Raising and lowering objects from one level to another, includes upward pulling over 35 lbs, with help of coworkers or assistive device.
Movement	Carrying under 35 lbs:	Frequent	Transporting an object holding in hands, arms or shoulder.
Movement	Carrying over 35 lbs:	Not Applicable	Transporting an object holding in hands, arms or shoulders, with help of coworkers or assistive device.
Movement	Push/Pull:	Occasional	Exerting force to move objects away from or toward.
Movement	Bending/Stooping:	Occasional	Trunk bending downward and forward by bending spine at waist requiring full use of lower extremities and back muscles.
Movement	Balancing:	Occasional	Maintaining body equilibrium to prevent falling when walking, standing, crouching or maneuvering self, patient and equipment simultaneously while working in large and small spaces.
Movement	Climbing:	Occasional	Ascending or descending stairs/ramps using feet and legs and/or hands and arms.
Movement	Crawling	Not Applicable	Moving about on hands and knees or hands and feet.
Movement	Kneeling:	Occasional	Bending legs at knees to come to rest on knee or knees.
Movement	Crouching/Squatting:	Occasional	Bending body downward and forward by bending legs and spine.
Movement	Reaching above shoulders:	Occasional	Extending arms in any direction above shoulders.
Movement	Reaching below shoulders:	Frequent	Extending arms in any direction below shoulders.
Movement	Handling:	Frequent	Seizing, holding, grasping, turning or otherwise working with hand or hands.
Movement	Fingering:	Frequent	Picking, pinching, gripping, working primarily with fingers requiring fine manipulation.
Movement	Bimanual Dexterity:	Frequent	Requiring the use of both hands.
Sensory	Communication:	Continuous	Expressing or exchanging written/verbal/electronic information.
Sensory	Auditory:	Continuous	Perceiving the variances of sounds, tones and pitches and able to focus on single source of auditory information.
Sensory	Vision:	Continuous	Clarity of near vision at 20 inches or less and far vision at 20 feet or more with depth perception, peripheral vision, color vision.
Sensory	Smell:	Continuous	Ability to detect and identify odors.
Sensory	Feeling:	Not Applicable	Ability to perceive size, shape, temperature, texture by touch with fingertips.
Sensory	Taste:	Not Applicable	Ability to detect quality, texture, consistency and taste of prepared foods/quality control.
Sensory	Noise:	Not Applicable	May include exposure to occupational noise levels which equal or exceed an 8-hr time-weighted average of 85 decibels, requiring enrollment in VUMC's Hearing Conservation Program which includes training, use of hearing protection, and periodic audiometry.
Environmental	Chemicals and Gases:	Occasional	Medications, cleaning chemicals, oxygen, other medical gases

Conditions			used in work area.
Environmental Conditions	Pathogens:	Occasional	Risk of exposure to bloodborne pathogens and other contagious illnesses.
Environmental Conditions	Radiation:	Not Applicable	May be exposed to occupational radiation, requiring enrollment in VUMC's Radiation Safety Program which includes training, use of personal protective equipment with lead shielding, and personal dose monitoring.
Environmental Conditions	Climate:	Not Applicable	Ability to withstand exposure to atmospheric extremes including heat, cold, humidity, and barometric pressure changes.
Environmental Conditions	Vibration:	Not Applicable	Subject to oscillating movement.

Vanderbilt University Medical Center is an Equal Opportunity Employer and adheres to the parameters of Section 504 of the Rehabilitation Act of 1973. In compliance with the Americans with Disabilities Act as amended, we will provide reasonable accommodations to qualified individuals with disabilities and encourage both prospective and current employees to discuss potential reasonable accommodations with us.

SUPPLEMENTAL TRAINING MATERIALS – HEAD LICE (PEDICULOSIS)

What are head lice?

- Lice are tiny insects that live on the scalp and crawl through the hair.
- Lice need human blood to live, and die within 24 hours if they cannot feed.
- Lice lay eggs (nits) that cling to the hair close to the scalp. Nits are oval shaped and most often can be seen in the hair behind the ears or near the neck.
- Lice hatch from nits after about 6 days, and can lay more eggs after 10 days.
- Head lice are not a sign of uncleanliness, and they don't spread disease.

What are the symptoms?

Scalp itching is the most common symptom.

How are head lice spread?

- Head lice are usually spread by head-to-head contact.
- Less often, lice can be spread by sharing clothing, combs, brushes, bedding, or sharing storage compartments (like lockers) with someone who has lice.

How are head lice treated?

- The American Academy of Pediatrics says the treatment of choice is permethrin 1% creme rinse (such as Nix®). It is available without a prescription. Follow the instructions on the package carefully.
- Permethrin creme rinse kills live lice, but not all of their eggs. You may need to apply it again after 7-10 days to treat the lice that hatch from the surviving eggs. Some experts recommend doing this even if you don't see live lice.
- Many alternative "chemical free" treatments are available, but there is not much scientific information on how well they work. Some might interfere with permethrin treatment.
- No treatment works 100% of the time. If you have questions or if treatment doesn't work, contact your health care provider.

What else do I need to do?

- Combing out nits after treatment with permethrin or other lice-killing medications is not necessary to prevent spreading lice.
- Some people do so that others won't mistake them for having live lice.
- Check everyone in your household for head lice. Treat those who share a bed with the person with infestation, and those with live lice or nits close to the scalp.
- Clean hair items and bedding used by infested persons. Washing, soaking, or drying items at temperatures greater than 130° F will kill stray lice or nits.
- **Don't spend a lot of time housecleaning, as lice are spread by head-to-head contact. Focus on items, clothing, furniture, or carpeting that have been in contact with the head of the person with infestation in the 24 to 48 hours before treatment.** Use a vacuum for carpeting, car seats, and other fabrics or fabric covered items. Don't use chemicals or insect sprays.
- Human head lice don't feed on pets, so pets do not need to be treated.

What about school?

- No child should be excluded from school or allowed to miss school because of head lice.
- Children with nits only should be allowed to return to school.

Additional information

- Ask your child care program or school if you have questions about their head lice policy.
- Visit the Centers for Disease Control and Prevention website: www.cdc.gov/parasites/lice/head

HEAD LICE INFORMATION FROM THE ASET CURRICULUM

<http://www.hsph.harvard.edu/headlice.html>

The link above contains information on the recognition of head lice and treatment options. Unfortunately since END technologists routinely handle the patient's hair and our electrodes rest on the patient's scalp, we will occasionally discover the presence of head lice on our patients. It is very important to remember that lice are insects and anyone, even those with the very best of personal hygiene can pick up head lice. It is most common in school age children and in recent years lice have become immune to the treatments that have been used for years.

A well-equipped END lab will be prepared for such an incident. If the patient is an inpatient, the nursing staff should be alerted. Special care should be taken to carefully clean all electrodes and surfaces of the equipment so as not to spread the insects to the next patient. If the patient is an outpatient you may want to establish a policy to cancel the appointment and reschedule after the lice have been eliminated. An information sheet on the treatment of lice is very helpful and should be provided to the patient at this time along with recommendations for eliminating the lice from not only the patient's hair, but bedding, clothing and carpeting within the home. The information sheet should encourage the patient or parents of the patient to not only treat the patient's hair, but to spray bedding and then wash clothing, bedding and pillows in hot water. Combs and brushes should be washed in hot water. A child's car seat cover, towels, and stuffed animals should be washed. The best way to eliminate lice from a home is to assume that the entire family should be treated and that the house should be treated as well. Also, prepare the patient or parents for the likelihood that there will be another outbreak in a week or so requiring an additional treatment.

Telling a patient or parent of a patient about the presence of head lice is a delicate matter. First of all, do not over react. It is only a bug. It is easy to pick up head lice and parent's should be reassured that there is no shame in it. If this is the first time you have seen it as an END technologist, rest assured that it will not be the last time you will see it. It is not a sign of lack of personal hygiene. As a matter of fact, lice prefer clean hair. It merely is an insect which is easily transferred from one person to another.

Some of the ways that lice can be transmitted are through the sharing of combs and brushes, sharing ball caps on the playground, and little girls playing dress up or beauty shop. It only takes brushing up against someone who is infested and it is very easily passed to an unsuspecting person. While it is not a shameful condition, though it is often perceived as such, it is something that should be treated as soon as possible to prevent spreading. After treatment, nits should be removed with a nit comb under a strong light. This process may take a long time but is the best way to prepare the child for re-entry to school and is the only way to make sure that the lice have been eliminated. Many parents will deal with this at some point during child raising and your attitude and reassurance will make it less traumatic for the child and parent or patient.

There are several treatment options which are detailed in the following website. The treatments may kill all the lice and some of the eggs but a repeat treatment in 10 days is usually needed. It is usually the policy that children should have no nits before they can return to school. Your lab should have a policy on head lice. Some patients may need to have their EEG completed and the lab closed down briefly for spraying after the test is complete. A surgical gown, gloves and surgical bonnet worn by the technologist, may help prevent spread of the lice to the staff. When rescheduling a patient with active head lice, explain that you also have a responsibility to the other patients who have testing scheduled in the lab today and you must go through a cleaning process before you can allow another patient into the lab. If care is not taken, the EEG lab can become a source of infestation for other patients. Most patients will understand this and happily reschedule.

This site has fun activities for kids and educational material about head lice.

<http://www.headlice.org/kids/animations/picknits.htm>

Things to remember:

- Be factual and polite.
- Be supportive and understanding
- Provide helpful information for the elimination of the lice from the patient, home and surroundings.
- Add illustrations and be creative.

Regulations that protect us:

The Environmental Protection Agency and Occupational Safety and Health Administration set standards for safe environment for employees. It is good to know the areas covered by these regulation that protect us in the workplace.

<http://www.epa.gov/> <http://www.osha.gov/>

**APPENDIX A: NEURODIAGNOSTIC
TECHNOLOGY PROGRAM
GRADUATE COMPETENCIES**

NEURODIAGNOSTIC TECHNOLOGY PROGRAM GRADUATE COMPETENCIES

The following graduate competencies for performing an electroencephalogram (EEG) and additional neurodiagnostic procedures, including introductory level Evoked Potential Studies (EP), Polysomnography Studies (PSG), Nerve Conduction Studies (NCS), Intraoperative Neurophysiological Monitoring (IONM), and Long Term Monitoring (LTM) are recommended as standards for the education of post-secondary students in neurodiagnostic technology (NDT) programs. Employers can expect the graduates of CAAHEP-accredited NDT programs to be competent in the areas defined below.

I. ELECTROENCEPHALOGRAPH (EEG)

- A. The graduate provides a safe recording environment by:
 - 1. verifying identity of patient
 - 2. cleaning electrodes after each procedure
 - 3. following universal precautions for infection control
 - 4. attending to patient needs appropriately
 - 5. recognizing/responding to life-threatening situations
 - 6. being certified to perform CPR
 - 7. following laboratory protocols for sedation
 - 8. complying with lab protocols for emergency and disaster situations
 - 9. complying with hazardous material handling procedures
 - 10. maintaining instrument/equipment in good working order
 - 11. taking appropriate precautions to ensure electrical safety.

- B. The graduate establishes rapport with the patient and patient's family by:
 - 1. using personal communication skills to achieve patient relaxation/cooperation
 - 2. explaining all test procedures including activation procedures
 - 3. explaining the electrode application method (paste, collodion, etc.)
 - 4. interacting on a level appropriate to patient's age and mental capacity
 - 5. maintaining respect and patient confidentiality.

- C. The graduate evaluates the patient to:
 - 1. determine the patient's mental age, mental state, and comprehension level
 - 2. note the patient's overall physical condition
 - 3. decide appropriate method of electrode application
 - 4. ascertain the patient's capacity to cooperate with activation procedures
 - 5. determine if hyperventilation is contraindicated
 - 6. accommodate for disabilities or special needs
 - 7. determine the need for additional physiological monitors
 - 8. document unusual or inappropriate behavior suggestive of seizure or another event
 - 9. determine the possible need for restraints or emergency intervention.

- D. The graduate prepares a basic data sheet ("tech sheet") that includes:
 - 1. patient information (name, age, ID number, doctor, etc.)
 - 2. recording time, date, and graduate's name or initials
 - 3. noting pertinent patient history and familial medical history
 - 4. listing current medications/sedation and time of last dosage
 - 5. noting time of last meal
 - 6. noting time, date, aura, and circumstances of last seizure or symptoms
 - 7. specifying the patient's mental, behavioral, and consciousness states
 - 8. diagramming skull defects or anomalies (if any)
 - 9. diagramming any modifications in electrode placement.

- E. The graduate's electrode application follows a method that includes:
 - 1. measuring and marking the head following the 10/20 measurement system
 - 2. adjusting electrode placement for anatomical defects or anomalies
 - 3. prepping patient's scalp prior to electrode application

4. applying electrodes with paste or with collodion and electrolyte
5. verifying electrode impedances are balanced and below 5,000 ohms.

F. The graduate has basic knowledge of analog EEG technology.

G. The graduate documents the working condition of a digital EEG instrument by:

1. calibrating system amplifiers
2. verifying standard filter settings
3. verifying sensitivity settings
4. inputting a biological (bio-cal) signal to all channels
5. correcting or reporting deviations as appropriate.

H. The graduate obtains a standard EEG that includes:

1. at least 20 minutes of technically acceptable recording (120 pages)
2. eye opening and closing to check effects of stimuli on EEG
3. hyperventilation for a minimum of 3 minutes
4. photic stimulation at frequencies appropriate for history & reactivity
5. mental stimulation/assessment procedures
6. periodic checks of electrode impedance
7. natural drowsiness and sleep, if possible
8. notations of montage, filters, paper speed, & sensitivity setting changes; and
9. notes on observed behavior, clinical seizure manifestations, etc.

I. The graduate customizes the recording procedure by:

1. evaluating reason for referral, history, and observed waveforms
2. utilizing techniques to bring out or enhance clinical symptoms
3. selecting montages appropriate for abnormalities seen and/or expected
4. selecting appropriate instrument settings
5. encouraging drowsiness and sleep
6. applying additional electrodes to localize abnormal activity
7. monitoring respiration if appropriate
8. monitoring ECG rhythms for abnormality.

J. The graduate understands and follows technical criteria for:

1. recording electrocerebral inactivity (brain death)
2. recording neonatal EEG
3. recording pediatric EEG
4. recording in intensive care or cardiac care units.

K. The graduate differentiates artifacts from cerebral waveforms by:

1. recognizing possible artifactual waveforms
2. documenting (on the recording) patient movements
3. applying/recording leads for eye potentials or other physiological potentials (i.e. respiration, EMG)
4. applying/recording leads for ECG
5. replacing electrodes exhibiting questionable activity or contact
6. troubleshooting for possible electrical interference.

L. When the EEG recording is finished the graduate:

1. removes electrode paste/glue from the patient's scalp and hair
2. describes clinically significant behavior
3. documents sedation used, dosage, and effects (if applicable)
4. reviews EEG for appropriate documentation of amplifier settings & montage changes.

M. The graduate understands (has a working knowledge of):

1. functional neuroanatomy and neurophysiology

2. medication effects on the EEG background and waveforms
3. medical terminology and accepted abbreviations
4. signs, symptoms, and EEG correlates for adult neurological disorders
5. signs, symptoms, and EEG correlates for pediatric neurological disorders
6. seizure manifestations, classifications, and EEG correlates
7. psychiatric and psychological disorders
8. other knowledge as detailed in the ABRET Electroencephalographic Technology Practice Analysis.

N. The graduate maintains and improves knowledge and skills by:

1. reviewing EEG tracings with EEGer on a regular basis
2. reading journal articles
3. studying text books related to the field
4. attending continuing education courses in neurodiagnostics.

O. The EEG graduate applies the principles of electronics and mathematics to recording by:

1. knowing how differential amplifiers work
2. computing voltage and frequency of waveforms
3. calculating the duration of waveforms
4. understanding the polarity of the waveforms
5. understanding impedance
6. understanding analog to digital conversion.

P. The graduate knows how waveform displays are affected by:

1. 60 Hertz filter
2. filter settings
3. sensitivity settings
4. paper speed
5. referential and bipolar montages
6. digital filters
7. electrode types and electrode material composition
8. malfunctioning equipment.

Q. The graduate recognizes

1. normal and normal variant awake and asleep patterns for each age range
2. abnormal awake and asleep patterns for each age range
3. EEG patterns for levels of consciousness
4. clinical seizure patterns.

The following competencies are only for an introductory level of competence and are not intended to encompass all of the knowledge and skills needed to perform advanced EEG, Evoked Potentials, Polysomnography, Nerve Conduction Studies, Intraoperative Neurophysiological Monitoring, or Long Term Monitoring. Graduates are encouraged to pursue the additional study that is required for competent performance on an advanced level.

II. INTRODUCTORY EVOKED POTENTIAL STUDIES (EP)

A. The graduate must:

1. have knowledge of the common indications for auditory, visual, and somatosensory evoked potentials
2. understand the anatomy, physiology, and pathology of selected sensory organs, nerves, and nerve pathways
3. understand the generators of evoked potentials
4. understand the principles of stimulation and accurate placement of recording electrodes
5. understand the principles of measuring waveforms and distances used in evoked potential studies

6. be familiar with the criteria for significant changes occurring during evoked potential recordings
7. have knowledge of the clinical correlations of evoked potential abnormalities
8. understand the concepts of near-field and far-field potentials
9. have knowledge of artifacts encountered during evoked potential studies and basic techniques for troubleshooting
10. be familiar with the concept of amplitude and latency measurements.

III. INTRODUCTORY POLYSOMNOGRAPHY STUDIES (PSG)

- A. The graduate must be capable of:
 1. recognizing sleep stages
 2. understanding the montages used in polysomnography
 3. initiating a technically adequate PSG by: a) preparing the patient; b) calibrating the patient and instrumentation; and c) obtaining a ten minute baseline recording.
 4. a basic understanding of common sleep disorders and treatment options
 5. performing the multiple sleep latency test (MSLT) and the maintenance of wakefulness test (MWT).

IV. INTRODUCTORY NERVE CONDUCTION STUDIES (NCS)

- A. The graduate must:
 1. understand the anatomy and physiology of selected muscles and nerves
 2. have knowledge of neuromuscular disorders
 3. understand the principles of stimulation and accurate placement of recording electrodes
 4. understand the principles of measuring waveforms and distances used in routine nerve conduction studies.

V. INTRODUCTORY INTRAOPERATIVE NEUROPHYSIOLOGICAL MONITORING (IONM)

- A. The graduate must:
 1. have knowledge of the common indications for intraoperative neurophysiological EEG, evoked potential and neuromuscular monitoring
 2. be aware of the criteria for significant changes during intraoperative monitoring
 3. have a general understanding of the effects of common anesthetic agents
 4. have a general understanding of the effects of physiological variables on monitoring results.

VI. INTRODUCTORY LONG TERM MONITORING (LTM)

- A. The graduate must:
 1. understand the indications for long-term monitoring for epilepsy and basic LTM procedures including: a) ambulatory EEG; b) monitoring with surface leads and intracerebral leads using video/EEG; and c) continuous EEG - intensive care monitoring.
 2. have knowledge of the instrumentation for long-term monitoring
 3. have knowledge of treatment options for epilepsy
 4. recognize common seizure patterns.