AMERICAN BOARD OF CLINICAL NEUROPHYSIOLOGY, INC.

Candidate Handbook

2025

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INTRODUCTION

The American Board of Clinical Neurophysiology, Inc. (formerly The American Board of Qualification in Electroencephalography, Inc.) was founded in 1946 by Herbert Jasper, M.D. It is one of the oldest free-standing Boards for medical certification.

The American Board of Clinical Neurophysiology (ABCN) provides certification programs to recognize licensed physicians who demonstrate knowledge, skill, and proficiency in clinical neurophysiology (CNP) in order to facilitate the safe and proper evaluation, diagnosis, and treatment of patients by completing a fellowship in Clinical Neurophysiology or Epilepsy. Successful candidates may earn subspecialty designations in General Clinical Neurophysiology, Epilepsy Monitoring (EM), Neurophysiologic Intraoperative Monitoring (NIOM), Critical Care EEG, and Pediatric EEG.

The ABCN Clinical Neurophysiology examinations are recognized by the American Society of Clinical Neurophysiology (ACNS). The examinations are administered by the Professional Testing Corporation (PTC) on behalf of ABCN. PTC utilizes Prometric testing sites and ProProctor for delivery of the computer-based examinations. Questions concerning the ABCN examinations should be directed to the ABCN Executive Office: (217) 726-7980 or email: janice@abcn.org

TRAINING REQUIREMENTS

The ABCN is an American medical subspecialty board. Therefore, all candidates for Diplomate status must be physicians (M.D., DO, M.B.B.S, or equivalent) with a valid license to practice medicine and who have completed the following:

- Primary board certification in Neurology/Pediatric Neurology or a related board recognized by the American Board of Medical Specialties (ABMS) following residency training
- Fellowship training for a minimum of 12 months (full-time or fulltime-equivalent through extended part-time training) or will complete training within three months of examination, supervised by a board-certified physician with subspecialty training in Clinical Neurophysiology, Epilepsy, Neurocritical Care, or Neuromuscular
- Verification of certification in Clinical Neurophysiology or Epilepsy through the American Board of Psychiatry and Neurology (ABPN)
- Candidates without subspecialty certification in Clinical Neurophysiology of Epilepsy must take the ABCN General Clinical Neurophysiology examination and will then be eligible to earn multiple subspecialty certifications through ABCN.

Candidates are expected to have broad exposure to the scientific basis of CNP, as well as relevant aspects of technique and instrumentation. Experience interpreting EEGs in all age groups and for a wide range of clinical disorders is expected. Additional knowledge of sleep, NIOM, EM, and evoked potentials (EP) is required depending on the selected track.

- **The Critical Care EEG exam** requires one year of Neurophysiology/Epilepsy Fellowship training or six months of EEG training during NeuroCritical Care Fellowship and an additional six months of supervised EEG experience completed within 24 months.
- **The NIOM exam** requires a minimum of four months or 640 hours of IOM training, at least half of which have been completed during an accredited CNP Fellowship.
- **The Pediatric EEG** exam requires a minimum of eight weeks of Pediatric-focused EEG training.

Candidates who are successful on ABCN examinations will be awarded a ten-year Diplomate certification in Clinical Neurophysiology or Clinical Neurophysiology with special qualification in Epilepsy Monitoring, Neurophysiologic Intraoperative Monitoring, Critical Care EEG, or Pediatric EEG.

ABEM and ABPN Electrodiagnostic/Neuromuscular Exemption

As of 2019, applicants who have earned Electrodiagnostic/Neuromuscular Medicine certification through the American Board of Electrodiagnostic Medicine (ABEM) or the ABPN may submit documentation of this certification to be exempt from the ABCN General Clinical Neurophysiology Examination. Eligibility will be granted to take the NIOM exam. Upon successful completion, a ten-year certification in NIOM will be awarded. Certificants will not be boarded in Clinical Neurophysiology.

International Candidates

The ABCN also offers examination and certification for international candidates who are ineligible for primary (US) board certification. Primary training in Neurology, nine to twelve months of subspecialty training in CNP, and a current medical license are required. Upon completing the General Clinical Neurophysiology examination, successful candidates will be awarded a ten-year "International Diplomate" in Clinical Neurophysiology and may take additional ABCN subspecialty exams in Epilepsy Monitoring, Neurophysiologic Intraoperative Monitoring, Critical Care EEG, or Pediatric EEG.

LENGTH OF ELIGIBILITY

It is expected that an examination must be satisfactorily completed within three years after notification of approval of the application. Failure to do so requires that a new application and fee be re-submitted. A candidate who fails may retest. Candidates are strongly advised to seek further education before re-examination. There is no limit to the number of times a candidate may attempt the examination within the three-year period.

APPLICATION PROCEDURE

Step 1 – Complete the ABCN Application

- Go to http://www.abcn.org/forms-fees to complete the Online Application Form.
- Upload your medical license.
- Submit the Verification of Training Form from your program. Please note there are forms specific to NIOM training and Pediatric EEG training.
- Pay the one-time application fee of $250.
- Select the exam(s) you will be taking.
- Pay the examination fee(s).

Please note: You must complete the examination application in full, entering your first and last name exactly as they appear on your current government-issued photo ID, such as a driver's license or passport.

Candidates who have trained in more than one location must have verification of their attendance from each Program Director to certify that the applicant has satisfactorily completed the program and can independently interpret the appropriate CNP area of interest. Endorsement requests should be obtained near the end of training.

A candidate may apply for the examination within the last three months of a Fellowship. Certification will be awarded upon successful completion of the examination(s) and notification from the Fellowship Director that the candidate has completed the Fellowship.

The applicant is responsible for obtaining the necessary supporting documentation from the Fellowship Director using the provided form(s). Program Directors should send completed forms to the ABCN Executive Office (or janice@abcn.org).

If applying under one of the exemptions on page 4, submit documentation satisfying the exemption to the ABCN Executive Office (janice@abcn.org). You may opt to take multiple exams during the same testing period.

The Executive Director of the ABCN will notify the candidate of application eligibility.

Step 2 – Complete the PTC Application Forms

- Go to https://secure.ptcny.com/apply to complete the online PTC application.
- **Retain the link to the form and your login information**.
- **Please note:** For new applications, you will be asked to create a PIN number. This PIN will be used when returning to your existing application.

Step 3 – Receive Scheduling Authorization and Schedule Testing Appointment

- Approved candidates will receive an email with their Scheduling Authorization before the start of the testing period. Scheduling Authorization emails come from notices@ptcny.com. Do not lose this email.
- The Scheduling Authorization includes essential information including:
    - Your PTC Candidate ID number
    - Instructions on how to make your Exam appointment with Prometric.

EXAMINATION ADMINISTRATION AND SCHEDULING

The ABCN Subspecialty examinations are administered daily during an established six-week testing period, Monday through Saturday, excluding holidays, at computer-based testing facilities managed by Prometric. Candidates may apply to take more than one examination during the testing period. Each exam session is two hours in length.

If you do not receive a Scheduling Authorization at least three weeks before the beginning of the testing period, contact the Professional Testing Corporation at (212) 356-0660 or online at www.ptcny.com/contact.

Scheduling Examination Appointments

Follow the steps on your Scheduling Authorization to schedule your examination appointment with Prometric. Appointment times are first-come, first-served, so schedule your appointment as soon as you receive your Scheduling Authorization. Candidates who wait until the last minute risk missing a preferred date, time, and/or testing center. Candidates who fail to schedule an appointment will forfeit their fees.

After you make your test appointment, Prometric will send you a confirmation email with the exam date, time, and location. Check this confirmation carefully and contact Prometric at (800) 741-0934 if there is a mistake with your appointment.

Note: Candidates may also schedule, reschedule within the same testing window, or cancel an appointment online at http://www.prometric.com/ABCN.

Scheduling a Remotely Proctored Examination Appointment

If you prefer to test via live remote proctoring in your home or another quiet, distraction-free location, you must provide:

- a computer
- a camera
- a microphone
- a stable internet connection

Please see the Live Remote Proctoring FAQs for more info: https://ptcny.com/remote-proctor-faqs/

The candidate's responsible for ensuring their equipment and workspace meet all the requirements for Live Remote Proctoring.

If a candidate makes an appointment for remote proctoring and is unable to test due to not meeting the technical requirements or physical requirements of the workspace, the candidate will forfeit their examination fees and will need to follow the transfer policies in place for their exam.

Test Center or Live Remote Proctoring: What's the Difference?

	Test Center Exam	Live Remote Proctored Exam
Additional cost	No	No
Breaks allowed	Unscheduled breaks are permitted; however the exam timer will continue counting down.	No breaks are permitted. Candidates must NOT leave camera view until the exam has ended.
Equipment needed	None – Computer provided at test center	The candidate provides their own laptop or desktop computer to take the exam. The computer must have: Webcam Microphone Secure, reliable internet For complete requirements: www.prometric.com/proproctorcandidate
Testing space needed	None – Testing space provided by the test center	Candidates must test alone at a desk or table in a room with a door and no distractions or interruptions. Other people or pets are not permitted in your testing area.
Check-in procedure	Candidates must show their current Government-issued photo ID; walk through a metal detector or be wanded by staff; and roll up sleeves and turn out pockets for a visual inspection.	Prior to check-in, the candidate's equipment needs to pass a compatibility check. During check-in, candidates must show their current Government-issued photo ID; perform a 360° scan of the room using their camera; and roll up sleeves and turn out pockets for a visual inspection.
Monitoring	Proctors monitor candidates through video and physical walkthroughs in the testing room.	Remote proctors monitor candidates through video and audio, as well as ProProctor security software.

This information is provided as a courtesy summary and may not represent full requirements or specifications for in-person testing or live remote proctored testing. For Live Remote Proctored FAQs, visit https://ptcny.com/remote-proctor-faqs/

IMPORTANT! You must present your current driver's license, passport, or U.S. Military ID at the testing center or to your Remote Proctor at the time of your examination appointment or you will be refused admission. The first and last name on the ID must exactly match the first and last name on the Scheduling Authorization.

Rescheduling Examination Appointments within a Testing Period

Candidates are able to reschedule their examination appointments within the same testing period as long as the request is submitted within the timeframe described below. Reschedule within the permitted time frame by calling or going to the Prometric website: www.prometric.com/ABCN.

Time Frame	Reschedule Permitted?	Stipulations
Requests submitted 30 days or more before the original appointment	Yes	None
Requests submitted 29 to 5 days before the original appointment.	Yes	Candidate must pay a rescheduling fee.
Requests submitted less than 5 days before the original appointment	**No**	Candidates who do not arrive to test for their appointment will be considered a no-show and all their examinations fees will be forfeited. Candidates will need to reapply and pay fees for a future testing period.

Failing to Report for an Examination

If you fail to report for an examination, you will forfeit all fees paid to take the examination. A new examination fee is required to reapply for the examination.

TESTING ACCOMMODATIONS

The ABCN and PTC support the intent of and comply with the Americans with Disabilities Act (ADA) and will take steps reasonably necessary to make certification accessible to persons with disabilities covered under the ADA. According to the ADA, an individual with a disability is a person who has a physical or mental impairment that substantially limits a major life activity (such as seeing, hearing, learning, reading, concentrating, or walking) or a major bodily function (such as neurological, endocrine, or digestive system).

The information you provide and any documentation regarding your disability and test accommodations is confidential and is not included in scoring or reporting.

All approved testing accommodations must maintain the psychometric nature and security of the examination. Accommodations that fundamentally alter the nature or security of the exam will not be granted.

To request test accommodations, follow these 3 steps:

1. Download the Request for Test Accommodations Form on the ABCN website or from www.ptcny.com.
2. Complete the Test Accommodations Form with your healthcare professional.
3. Submit the completed and signed Request for Test Accommodations Form with the online exam application and submit **at least 8 weeks prior** to the start of your chosen testing period.

NOTES:

- Only those requests made and received on the official Request for Test Accommodations Form will be reviewed.
- All requests must be made at the time of application. Accommodations cannot be added to an existing exam appointment.
- If you miss the 8-week deadline, you may not be able to test during your chosen testing period and you will be subject to rescheduling or transfer fees.
- Do not go to www.prometric.com or contact Prometric to request test accommodations as they are not authorized to approve accommodations. All requests for test accommodations must be submitted using the PTC Request Form.
- If you need to use your cell phone or another electronic device to monitor a medical condition, such as diabetes, please be sure to include this on Part 1 of the Request for Test Accommodations Form so that Prometric can be notified in advance.
- Only pre-approved test accommodations will be permitted on the day of the examination. Test center personnel are not authorized to make any changes to the test accommodations on the day of the testing session and any such change may result in your examination appointment being canceled.

PREPARING FOR THE EXAMINATION

- Check your driver's license, passport, non-driver state issued ID or U.S. Military ID.
    - Is it expired?
    - Does the first and last name on your ID match the first and last name on your Scheduling Authorization email?
    - Proctors at Prometric testing centers will refuse admission to candidates with expired ID, IDs with names that do not match their records, and temporary paper IDs. Candidates will be marked as no-shows and will forfeit their exam fees.

- Check your PTC Scheduling Authorization email and Prometric Appointment Confirmation email to make sure everything is accurate (i.e., your first and last name, exam name, appointment date, time and location).
- Make yourself familiar with the location of your test center and parking options and check the weather and traffic conditions before you leave for the test center. Allow plenty of time as late arrival may prevent you from testing.
- In the event of inclement weather, check the Prometric website for site closures: https://www.prometric.com/closures
- Prometric's website provides information on what you can expect on your test day, including a walkthrough of check in and security procedures: https://www.prometric.com/test-center-security.
- Review "What to Expect at the Test Center" and "Rules for the Examination" below before your appointment.

Testing via Live Remote Proctoring

- Be sure to check your system compatibility BEFORE you schedule and again before your appointment.
- The check-in process is about 30 minutes long and is not factored into your appointment. Be sure to log into ProProctor to start your exam at least 30 minutes before your appointment.
- Candidates are not permitted to take a break during the examination and must always stay within camera view.
- **No scratch paper is allowed.** Keep your workspace clear of extra items and electronic devices except for your government-issued photo ID.
- Read the Live Remote Proctoring FAQs here: https://ptcny.com/remote-proctor-faqs/

What to Expect at the Testing Center

- Candidate Check-In
    - Candidates will be asked to:
        - present their ID.
        - empty and turn out their pockets.
        - walk through a metal detector or get "wanded".
    - Eyeglasses, jewelry, and other accessories will be inspected.
        - Jewelry other than wedding and engagement rings is prohibited.
        - Leave these at home or place them in your locker.
    - Religious headwear may be worn into the testing room; however, it is subject to inspection by test center staff.
    - Prometric provides lockers to store purses, backpacks, mobile phones, jackets, food, drinks and medical supplies.
    - Water in a clear plastic containers (no labels) may be brought into the testing room.
- During the Exam

- No breaks are scheduled during the exam.
- Candidates are only permitted to leave the testing room to use the restroom or access food, drink, or medicine from their assigned locker. The exam timer will NOT be paused.
- Smoking is prohibited at the testing center.
- All examinations are monitored and may be recorded in both audio and video format.

- Keep in mind:
  - Other exams will be administered at the same time as your examination.
  - You may hear ambient noises such as typing, coughing, or people entering and exiting the testing room that cannot be avoided.
  - Prometric is unable to provide a completely noise-free environment.
  - Headphones may be requested to minimize the impact of ambient noise.
  - Proctors will periodically walk through the testing room as part of their monitoring process.
  - See Prometric's website for more information about what to expect on testing day.

RULES FOR THE EXAMINATION

Read the information below carefully. You are responsible for adhering to the examination rules while at the testing center.

- **DO NOT BRING**: The testing center strictly prohibits these items. Leave these items in your car or your assigned locker.
  - Cell phones and all other electronic devices
  - Watches
  - Jackets/coats/bulky clothing such as sweatshirts
  - Hats (except hats worn for religious reasons)
  - Jewelry, including watches and wearable technology.

⇨ You may NOT access the following at any time during your exam or breaks: papers, books, any reference materials, or electronic devices, including your cell phone. Candidates may access the following items from their locker: snacks, drinks, medicine, or other personal healthcare items.

⇨ No questions concerning the content of the examination may be asked during the examination session. Please read the directions provided on the screen carefully at the beginning of the examination session.

⇨ You are prohibited from leaving the testing room while your examination is in session, except for going to the restroom. Candidates who do go to their lockers or the restroom will need to repeat the security screening before being permitted to reenter the testing room. **Candidates who leave the center will have their examinations terminated.**

⇨ See Prometric's statement on Test Center Security for more information.

Contact PTC at (212) 356-0660 or www.ptcny.com/contact with any questions about the Examination Rules.

Irregular or improper behavior that is observed, made apparent by statistical analysis, or uncovered by other means before, during or after the examination will be considered a violation of these rules and may constitute grounds for invalidation of a candidate's examination. ABCN will initiate an investigation and request suitable analyses and appropriate documentation.

EXAMINATION RESULTS

At the end of the examination, candidates will receive an email with a link to their preliminary test results. Approximately four weeks following the close of the testing period, official test results will be sent to ABCN. Score reports will be sent directly to the candidate. ABCN will not release exam results to a third party.

To request a Handscore Report of the examination, visit www.ptcny.com to complete the request form. There is a fee for this service.

Complaints must be written to the Executive Office no later than 14 calendar days after the examination. Examination materials shall not be available for candidates to review.

Certificates are sent to successful candidates within eight weeks of receipt of official results. The names of new Diplomates and Certificants are announced on the ABCN website, shared with the American Clinical Neurophysiology Society, and may be published in the Journal of Clinical Neurophysiology. Contact information will not be provided. New certificants are added to the ABCN online verification database at www.abcn.org. An opt-out preference is available to prevent disclosure by notifying the ABCN Executive Office (janice@abcn.org).

CERTIFICATION AND RECERTIFICATION

Candidates will be certified by the ABCN when they have passed the assigned examination(s). Those successfully completing the exam(s) will be awarded the following designation(s):

- Diplomate of the ABCN in Clinical Neurophysiology
- Diplomate of the ABCN in Clinical Neurophysiology with special qualification in Epilepsy Monitoring
- Diplomate of the ABCN in Clinical Neurophysiology with special qualification in Intraoperative Monitoring.
- Diplomate of the ABCN in Clinical Neurophysiology with special qualification in Critical Care EEG.
- Diplomate of the ABCN in Clinical Neurophysiology with special qualification in Pediatric EEG.

ABCN certificates are time-limited. Diplomates are subject to recertification every ten years. Recertification requires the submission of 45 hours of Category I CME in Clinical Neurophysiology, Epilepsy, Pediatric EEG, NIOM, or Critical Care EEG every five years, culminating in 90 hours by year 10. Recertification may be completed online. Current fees will apply. See the Recertification page on the ABCN website. Discounts are available for Diplomates renewing more than one certification.

Any certificate issued by the Board shall be subject to revocation any time the Board determines in its sole discretion that the diplomate to whom the certificate was issued either was not properly qualified to receive it or has since become disqualified because the medical license of the diplomate is withdrawn or suspended

for cause. Individuals whose certificate has been revoked by the Board will be entitled to appeal the Board's action by submitting new evidence to the Board. Any such appeal process must be initiated in writing. If this is done, the Board will consider the new evidence and then take final action. Once this procedure is completed, the Board's decision will be final and uncontestable. Upon reinstatement of the license, certification will be reinstated upon petition by the physician.

The Diplomate is responsible for informing the Executive Office of changes in name, contact information, and licensure status as soon as they occur.

VERIFICATION OF CREDENTIALS

ABCN Diplomates database is maintained in the ABCN Executive Office. An online database of diplomates is maintained on the ABCN website for verification purposes. Requests to verify credentials in writing should be directed to the Executive Office.

THE BOARD OF DIRECTORS

The Board consists of appointed or elected physicians with particular expertise in clinical neurophysiology.

American Board of Clinical Neurophysiology

Examination in General Clinical Neurophysiology

I. Basic physiology and instrumentation (20%)

A. Physiology
   1. Anatomy of neural generators
   2. Mechanisms of EEG and evoked potential generation
   3. Pathophysiology of abnormal waveforms

B. Instrumentation and Recording
   1. Basic electricity and electronics
   2. Amplifiers
   3. Filters
   4. Principles of EEG digitalization

C. Electrical safety

D. Electrodes and montages

E. Determination of brain death and ECI

II. Routine EEG (30%)

A. Normal EEG
   1. Maturational changes and normal findings across the age spectrum: Neonatal, pediatric, adult, elderly
   2. Normal waking and sleep patterns
   3. Normal variants
   4. Activation procedures

B. Abnormal EEG
   1. Neonatal and childhood encephalopathies
   2. Interictal epileptiform abnormalities
   3. Focal background abnormalities
   4. EEG correlates of encephalopathy

C. Drug and treatment effects

D. Artifacts

III. Epilepsy monitoring (20%)

A. Seizure localization

B. Correlation of interictal EEG findings with seizure type / epilepsy syndrome

C. Correlation of behavioral and EEG changes

D. Non-epileptic events (functional and physiological)

E. Planning and interpretation of intracranial monitoring

IV. Critical Care EEG Monitoring (10%)

A. Periodic and Rhythmic Patterns/ Standardized terminology

B. Quantitative EEG

C. ICU specific artifacts

V. EP and IOM (15%)

A. Clinical evoked potentials – visual, brainstem auditory and somatosensory
    1. Stimulation and recording techniques2. Presumed generators of major waveforms
    2. Criteria for abnormality
    3. Clinical correlation of normal/abnormal findings
B. Intraoperative monitoring
    1. Impact of anesthetics, environmental and systemic factors on monitoring
    2. SEP/MEP/EMG monitoring for spinal cord surgery
    3. BAEP monitoring for brainstem surgery

VI. Sleep (5%)

A. Recognition of sleep stages and arousals
B. PSG findings in common sleep disorders
C. Interpretation of MSLT

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Epilepsy Monitoring Exam Content Outline

The Epilepsy Monitoring Track will contain more case-based items and will incorporate video segments.

I. Correlation of interictal EEG with seizure type - 10%

A. Partial onset
B. Secondarily generalized
C. Primary generalized
    1. Convulsive
    2. Nonconvulsive

II. Identification of various patterns of ictal onset, propagation, and resolution along with their localizing significance in scalp recordings - 25%

A. Focal onset seizure
B. Generalized convulsive seizure
C. Generalized nonconvulsive seizure
D. Syndromes
    1. Hypsarrhythmia – electrodecremental seizures
    2. Lennox Gastaut syndrome
    3. Electrical SE during slow sleep
    4. Landau-Kleffner syndrome
E. Recognition of non-ictal events & patterns
    1. Artifacts
    2. Nonepileptic paroxysmal patterns
F. Technical aspects
    1. Appropriate recording montages
    2. Activation techniques
    3. Other approaches that may assist in event interpretation

III. Recognition of clinical manifestations of various seizure types, and their appropriate classification - 20%

A. Simple partial
B. Complex partial
    1. Automatisms
    2. Lateralizing signs
    3. Localizing signs
C. Secondarily generalized
    1. Lateralizing signs
    2. Localizing signs

D. Primary generalized
    1. Convulsive
    2. Absence
E. Myoclonic
F. Atonic

IV. Identification and localization of neonatal seizures - 6%

A. Interictal EEG patterns
B. Ictal EEG patterns
    1. Focal
    2. Multifocal
C. Clinical manifestations

V. Recognition of behavioral features suggestive of non-epileptic events - 15%

A. Psychogenic
B. Arrhythmia
C. Parasomnia
D. Other

VI. Planning and Interpretation of Intracranial Monitoring - 12%

A. Indications for intracranial monitoring
B. Choice of intracranial electrodes
    1. Subdural strips
    2. Grids
    3. Depth electrodes
C. Interictal epileptiform activity
D. Ictal activity
    1. Identification of seizure onset
    2. Localization

VII. Evaluation of patients for epilepsy surgery - 12%

A. EEG findings leading to
    1. Temporal lobectomy
    2. Corpus callosotomy
    3. Multiple subpial transection
B. EEG and the intracarotid amobarbital test (Wada)
C. Intraoperative electrocorticography
    1. Uses
    2. Limitations

American Board of Clinical Neurophysiology
Neurophysiologic Intraoperative Monitoring Exam Content Outline

The NIOM Track will contain more complex multiple-choice questions focused on all aspects of Neurophysiologic Monitoring. Candidates will have two hours to complete 100 items.

I. Basic NIOM techniques (Methodology and Principle/Neurophysiologic Anatomic Correlation) – 20%

- A. SEP
- B. MEP
- C. BAEP
- D. EEG
- E. ECoG
- F. EMG/NCS
- G. VEP
- H. Others

II. Planning an NIOM procedure – 5%

- A. Customized multimodal technique for monitoring and mapping
  1. Extracting the necessary information from patient history and exam
  2. Choosing the appropriate techniques
  3. Foreseeing challenging recordings (poor baselines, changes with position)
- B. Discussing the plan with surgical/anesthesia teams

III. Live NIOM monitoring and mapping – 40%

- A. Critical steps of different surgical procedures
- B. Interpretation of monitoring results: expected patterns of neurophysiologic changes and mechanisms of injury
- C. Management of the neurophysiologic changes
- D. Interpretation of mapping results
- E. Communication in the operating room and documentation

IV. Anesthetic effects on neurophysiologic recordings – 15%

- A. SEP
- B. MEP
- C. BAEP
- D. EEG
- E. ECoG
- F. EMG/NCS
- G. VEP
- H. Anesthesia not modality-related
- I. Others

V. Operating room procedures (Equipment/networking issues and technical troubleshooting) – 15%

A. NIOM equipment, hardware, and software (e.g., amplifiers, filters, averaging, electrical issues)
B. Other NIOM equipment (e.g., electrodes, stimulators, cables, connectors)
C. Networking/Remote access
D. Anesthesia and OR equipment, sterilization, safety in the operating room.

VI. Ethical and medicolegal issues – 5%

A. ACNS guidelines
B. AANEM guidelines
C. AAN guidelines
D. Billing rules/CPT coding
E. Standard of care and other medicolegal issues
F. Other

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Critical Care EEG Monitoring Exam Content Outline

I. Terminology – 15%

- A. Standardized critical care EEG nomenclature
- B. Periodic discharges and modifiers
- C. Rhythmic delta activity and modifiers
- D. Clinical correlation

II. Technical aspects of recording – 5%

- A. Electrodes
- B. Montages
- C. Troubleshooting

III. Background patterns – 15%

- A. EEG correlates of different types of encephalopathy
- B. EEG continuity and reactivity
- C. Medication effects

IV. Artifacts – 10%

- A. Physiological
- B. Non-physiological

V. Quantitative EEG – 25%

- A. Basic principles of qEEG and trending
- B. Clinical application
    1. Identification of seizures
    2. Identification of ischemia
    3. Recognition of artifacts

VI. Indications for long term ICU EEG monitoring – 5%

- A. Seizures
- B. Cerebrovascular disease
- C. Coma and altered consciousness

VII. Seizures and status epilepticus – 15%

- A. Non-convulsive seizures
- B. Status epilepticus
- C. Ictal-interictal continuum

VIII. Hypoxic-ischemic brain injury – 10%

- A. Dynamic EEG changes
- B. Prognosis

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Pediatric EEG Exam Content Outline

I. Pediatric Electroencephalography (Infant to adolescent) – 35%

- A. Age-related normal patterns
  1. Wakefulness
  2. Drowsiness
  3. Sleep
- B. Benign variants and variants of unknown clinical significance
- C. Non-epileptiform abnormalities
- D. Epileptiform abnormalities
  1. Interictal
  2. Ictal
- E. Medication effects
- F. Activation procedures
  1. Hyperventilation
  2. Photic stimulation
- G. Artifacts

II. Pediatric Prolonged Monitoring – 35%

- A. Clinical correlation of EEG with behavior/seizure type/epilepsy- related syndrome
- B. Seizure semiology
- C. Localization and propagation of seizures
- D. EEG in relation to non-epileptic events
- E. Periodic, coma and seizure patterns
- F. Status epilepticus

III. Neonatal EEG – 30%

- A. Basic EEG characteristics of premature and term neonates
- B. Age-related EEG waveforms
- C. Ontogeny of sleep/wake cycling
- D. Non-epileptiform abnormalities
- E. Epileptiform abnormalities
- F. Clinical correlation of EEG with medical condition/epilepsy-related syndrome

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REFERENCES

The latest editions of the following references may be of some help in preparing for the ABCN examination. This list does not attempt to include all acceptable references, nor is it suggested that the exam is necessarily based on these references.

Abou-Khalil B., Misulis K.E., Atlas of EEG and Seizure Semiology. 2nd Ed. Oxford, 2013

American Clinical Neurophysiology Society Guidelines www.acns.org.

Aminoff M.J. (Ed.) Electrodiagnosis in Clinical Neurology, 6th Edition. Churchill Livingstone, 2012.

Blume WT., Halloway GH, Kaibara M., Young GB., Blume's Atlas of Pediatric and Adult Electroencephalography. Wolters Kluwer 2010.

Brenner RP and Scheuer M. EEG on DVD – Adult: An Interactive Reading Session. Demos Medical, 2013.

Chiappa K., Evoked Potentials in Clinical Medicine, 3rd Ed. Raven Press, 1997.

Chokroverty S. (Ed) Sleep Disorders Medicine: Basic Science, Technical Considerations and Clinical Aspects, 4th Ed. Springer, 2017.

Doose H. EEG in Childhood Epilepsy: Initial Presentation and Long-Term Follow-up. John Libbey: Paris, 2003.

Ebersole JS, Husain AM, Nordli DR. Current Practice of Clinical Electroencephalography, 4th Edition. Wolters Kluwer, 2014.

Fisch BJ, Epilepsy and Intensive Care Monitoring. Demos Medical, 2010.

Fisch B., Fisch & Spehlmann's EEG Primer: Basic Principles of Digital and Analog EEG, 3rd Revised and Enlarged Edition. Elsevier. 1999.

Galloway G. Clinical Neurophysiology in Pediatrics: A Practical Approach to Neurodiagnostic Testing and Management. Springer Publishing, 2015.

Geyer J.D., Carney PR, Payne T. Atlas of Polysomnography, 2nd Ed. Lippincott, Williams & Wilkins. 2010.

Goldensohn ES, Legatt AD, Koszer S., Wolf SM. Goldensohn's EEG Interpretation: Problems of Overreading and Underreading, 2nd Revised Ed. Futura. 1999.

Hirsch L.J. and Brenner R.P., Atlas of EEG in Critical Care, 2nd Edition. Wiley Blackwell, 2010.

Husain A.M., Illustrated Manual of Clinical Evoked Potentials. Demos, 2017.

Husain A.M. (Ed) A Practical Approach to Neurophysiologic Intraoperative Monitoring. 2nd Edition. Demos, 2015.

Husain A.M., Practical Epilepsy. Demos Medical, 2015.

Kaplan P.W. and Drislane F.W., Nonconvulsive Status Epilepticus. Demos, 2009.

Kartush J.M. and Bouchard K. R., Neuromonitoring in Otology and Head and Neck Surgery. Raven Press, 1993.

Krauss G.L., Fisher. R.S., Kaplan P.W. The Johns Hopkins Atlas of Digital EEG: An Interactive Guide, 2nd Edition. Johns Hopkins Press, 2013.

Kryger M.H., Roth T., Dement W. Principles and Practice of Sleep Medicine, 6th Ed. W. B. Elsevier Health Sciences, 2016.

LaRoche S.M. and Haider H.A. Handbook of ICU EEG Monitoring, 2nd Ed. Demos Medical, 2018.

Lee-Chiong T., Mattice, Brooks R. Fundamentals of Sleep Technology. 3rd Ed. Wolters Kluwer, 2019.

Lee K. The Neuro ICU Book, 2nd Ed. McGraw Hill Medical, 2017.

Leis A.A. Atlas of NCS Electromyography. Oxford University Press, 2013.

LeRoux P.D., Levine J.M., Kofke A.W., Monitoring in Neurocritical Care: Expert Consult. Saunders, 2013.

Misulis K.E. and Head T.C., Essentials of Clinical Neurophysiology, 3rd Ed. Butterworth Heinemann, 2003.

Misulis K.E., Atlas of EEG, Seizure Semiology, and Management, 2nd Edition. Oxford University Press, 2013.

Misulis K.E. Spehlmann's Evoked Potential Primer, 3rd Ed. Humana Press, 2011.

Mizrahi E.M., Hrachovy R.A. Kellaway, P., Atlas of Neonatal Electroencephalography, 4th Edition. Springer Publishing, 2015.

Møller A.R., Intraoperative Neurophysiologic Monitoring, 3rd Ed. Springer Publishing. 2011.

Nuwer M.R. (Ed.) Intraoperative Monitoring of Neural Function: Handbook of Clinical Neurophysiology (Volume 8). Elsevier, 2008.

Pellock J.M., Nordli D.R., Sankar R., Wheless J.W. Pellock's Pediatric Epilepsy: Diagnosis and Therapy, 4th Ed. Demos Medical 2016.

Pressman M.R. Primer of Polysomnogram Interpretation. Butterworth-Heinemann. 2002.

Rosenow F., Lüders O.H. (Eds.) Presurgical Assessment of the Epilepsies with Clinical Neurophysiology and Functional Imaging Handbook of Clinical Neurophysiology, Volume 3, Elsevier, 2004.

Russell G.B., Rodichok L.D. (Eds.) Primer of Intraoperative Neurophysiologic Monitoring. Butterworth-Heinemann, 2005.

Sansevere A.J. Atlas of Pediatric and Neonatal ICU EEG, Demos, 2020.

Schomer D.L., Lopes da Silva F.H. Niedermeyer's Electroencephalography: Basic Principles, Clinical Applications and Related Fields, 7th Ed. Oxford University Press. 2017.

Simon M.V., Intraoperative Neurophysiology, 2nd Ed. Demos Medical, 2018.

Stern J.M., Sirven J.I. Atlas of Video-EEG Monitoring, McGraw Hill, 2011.

St. Louis E.K., Frey L.C., Britton J.W., Pestana-Knight E.M., Lievens W.E., Korb P., Hopp J.L, Koubeissi M.Z. Electroencephalography (EEG): an introductory text and atlas of normal and abnormal findings in adults, children, and infants. West Hartford (CT: American Epilepsy Society; 2016 (e-book)

Stern J.M., Atlas of EEG Patterns, 2nd Ed. Lippincott, Williams & Wilkins, 2013.

Tatum W.O. Atlas of Artifacts in Clinical Neurophysiology. Demos Medical, 2019.

Tatum W.O. Handbook of EEG Interpretation. Demos, 2014.

Wyllie E., Gidal B.E., Goodkin H.P., Jehi L, Loddenkemper T. The Treatment of Epilepsy: Principles and Practice, 7th Ed. Lippincott, Williams & Wilkins, 2020.

Yamada T. and Meng E. Practical Guide for Clinical Neurophysiologic Testing: EEG, 2nd Ed. Wolters Kluwer, 2017.

Yamada T. and Meng E., Practical Guide for Clinical Neurophysiologic Testing: EP, LTM/ccEEG, IOM, PSG and NCS/EMG, 2nd Ed. Wolters Kluwer, 2011.

Zouridakis G. and Panpanicolaou A. A Concise Guide to Intraoperative Monitoring. Lewis, 2000