PART I EXAMINATION INFORMATION

The three-hour examination will be administered during an established two-week testing period at PSI Computer Testing, Inc. The examination consists of 120 objective, multiple-choice questions (1 correct answer and 3 distractors). Admission to the examination requires submission of the application and application fee. Once accepted, the examination fee is due to ABCN no later than the published application deadline.

PSI has many computer-based testing sites in the United States. Scheduling is done on a first-come, first-service basis. Please note that hours and days of availability vary at different centers. You will not be able to schedule your examination appointment until you have received an eligibility notice from the ABCN testing organization, Professional Testing Corporation (PTC).

If you do not receive an eligibility notice or other correspondence at least three weeks before the beginning of the two-week testing period, please check your spam folder before contacting PTC directly by telephone at 212-356-0660.

If you need to cancel your examination appointment or reschedule to a different date within the testing period you must contact PSI at 800-211-2754 no later than noon, Easter Standard Time of the second business day PRIOR to your scheduled appointment. There are no refunds for this examination. If you fail to arrive for your appointment or cancel without giving the required notice, you will forfeit your testing fee.

A candidate who fails the Part I examination may repeat the test within two years without filing a new application by advising the Executive Director and submitting a second examination fee. If the candidate does not pass the examination within five years, a new application, application fee, and examination fee must be filed with the Board. Eligibility requirements will be those in place at the time of the new application.

Part I Content Outline

I. Physiology and Instrumentation

A. Physiology
   1. Anatomy of neural generation
   2. Mechanisms of EEG and evoked potential generation
   3. Pathophysiology of abnormal waveforms
   4. Basic mechanisms of epileptogenesis

B. Instrumentation and Acquisition Procedures
   1. Basic electricity and electronics
   2. Amplifiers and their characteristics
   3. Calibration
   4. Filters
   5. Localization and polarity
   6. Artifacts
   7. Electrical safety
   8. Computers and principles of averaging
   9. Electrodes and their application
   10. Techniques of ECS determination
   11. Statistics
   12. Long term monitoring
   13. Instrumentation and safety in the operating room
   14. Principles of EEG digitalization
II. Clinical EEG  
20%  

A. Basic EEG Patterns from Prematurity to Senescence  
1. Maturational changes  
   a. Neonatal  
   b. Other age related changes  
2. Normal adult patterns-wake  
3. Normal variants  
4. Activation procedures  

B. Clinical Correlation  
1. Seizures  
2. Other paroxysmal and transient conditions  
3. Focal lesions  
4. Diffuse and multifocal encephalopathies  
5. Coma  
6. Brain death  
7. Drug and other treatment effects  
8. Patterns of uncertain significance  
9. Disorders affecting sleep patterns  
10. Periodic patterns  
11. Neonatal disorders  
12. Extended monitoring  

C. Sleep  
1. Physiology  
2. Instrumentation  
3. Clinical  

III. Clinical Evoked Potentials  
14%  

A. Visual  
1. Stimulus and recording techniques  
2. Physiological parameters  
3. Standard parameters of stimulation and recording  
4. Criteria of abnormality  
5. Clinical correlation  

B. Auditory  
1. Stimulus and recording techniques  
2. Physiological parameters  
3. Standard parameters of stimulation and recording  
4. Criteria of abnormality  
5. Clinical correlation  

C. Somatosensory  
1. Stimulus and recording  
2. Physiological parameters  
3. Standard parameters of stimulation and recording  
4. Criteria of abnormality  
5. Clinical correlation  

D. Event related  
1. Stimulus and recording techniques  
2. Physiological parameters
3. Standard parameters of stimulation and recording
4. Criteria of abnormality
5. Clinical correlation

IV. Sleep

A. Technical, polysomnography
   1. Selection of appropriate recorded variables
      a. Neonates and children
      b. Adults
   2. Recording parameters for different variables
   3. Recording respiration
   4. Artifacts

B. Physiology
   1. Sleep stage criteria
      a. Neonates and children
      b. Adults
   2. Patterns of drowsiness and sleep
      a. Neonates
      b. Children, adults, elderly
   3. Sleep indices criteria
   4. Normal sleep architecture
   5. Normal EEG patterns of drowsiness in children, adults and elderly
   6. Circadian rhythms and sleep
   7. Neural and neurochemical control of sleep patterns
   8. Effects of sleep deprivation, sleep needs

C. Clinical aspects
   1. Effect on epileptiform activity and seizures
      a. Neonates and children
      b. Adults
   2. Common parasomnias
   3. Effects of drugs on sleep architecture
   4. Criteria of abnormal sleep architecture
   5. Disorders of excessive somnolence
      a. Polysomnographic testing in diagnosis
      b. Multiple sleep latency testing in diagnosis
   6. Disorders of initiation and maintenance of sleep
   7. Abnormalities of sleep in CNS disease
   8. Indications for sleep monitoring

V. Intraoperative Monitoring

A. SEP monitoring for spinal cord, brainstem and cerebral surgery
B. BAEP monitoring techniques for eighth nerve and brainstem surgery
C. EEG monitoring for cerebral surgery
D. Motor evoked potential monitoring for spinal cord surgery
E. Cranial nerve monitoring
F. Criteria for decision making
G. Influence of anesthetic agents

VI. Epilepsy
A. Applications and limitations of ambulatory EEG monitoring
B. Applications and limitations of video/EEG monitoring
C. Recognition of ictal patterns
D. Correlation of EEG patterns with clinical syndromes
E. Intracranial recording

PART II EXAMINATION INFORMATION

The Part II three-hour examination will be administered during an established two-week testing period at PSI Computer Testing, Inc.

The examination consists of approximately 100 objective, multiple-choice questions (1 correct response and 3 distractors). Candidates will have three hours to complete the track selected. Acceptance to the examination requires submission of a Part II application, scanner form and exam fee per track.

The candidate must select at least one of the four tracks for the completion of Part II. These tracks include Epilepsy Monitoring, Neurophysiologic Intraoperative Monitoring, General Clinical Neurophysiology and Critical Care EEG Monitoring.

PART II CONTENT OUTLINES

Epilepsy Monitoring Track
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
   D. Primary generalized
      a. Convulsive
      b. 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
    D. Generalized nonconvulsive seizure
    C. Syndromes
       1. Hypsarrhythmia – electrodecremental seizures
       2. Lennox Gastaut syndrome
       3. Electrical SE during slow sleep
       4. Landau-Kleffner syndrome
       5. Recognition of non-ictal events & patterns
          a. Artifacts
b. Nonepileptic paroxysmal patterns

6. Technical aspects
   a. Appropriate recording montages
   b. Activation techniques
   c. 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
   D. 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

Neurophysiologic Intraoperative Monitoring Track
Content Outline

The NIOM Track will contain more complex multiple-choice questions focused on all aspects of Neurophysiologic Monitoring. Candidates will have three hours to complete 120 items.

I. Basic NIOM techniques 25%
   A. SEP
   B. MEP
   C. BAEP
   D. EEG
   E. ECoG
   F. EMG/NCS
   G. VEP
   H. Others

II. Anatomy and physiology 15%
   A. Cerebral cortex
   B. Subcortical structures
   C. Brainstem and cerebellum
   D. Ascending and descending pathways
   E. Cranial nerves
   F. Spinal cord
   G. Peripheral nerves, neuromuscular junction, muscles
   H. Vascular anatomy
   I. Head and neck
   J. Spine and other bones
   K. Cellular physiology
   L. Others

III. Surgical procedures and NIOM (to include surgical technique and NIOM questions) 25%
    A. Vertebral column surgery
    B. Spinal cord surgery
    C. Lumbosacral surgery
    D. Tethered cord surgery
    E. Peripheral nerve surgery
    F. CPA surgery
    G. Vascular surgery
    H. Cardiac and aortic surgery
    I. Epilepsy surgery
    J. Brain tumor surgery
    K. Posterior fossa decompression surgery
    L. Selective dorsal rhizotomy
M. Pain surgery
N. Movement disorders surgery
O. Cranial nerve surgery
P. Pelvic floor surgery
Q. Hip surgery
R. ENT surgery
S. Other surgery

IV. Anesthetic considerations 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 5%
A. Sterilization techniques
B. OR equipment
C. Anesthesia equipment
D. Aseptic techniques/sterile field
E. Imaging
F. Communication

VI. Equipment/Networking issues 10%
A. Electrodes
B. NIOM machines (incl. amplifiers, filters, averaging, electrical issues, etc)
C. Networking, remote access
D. Other/Ancillary equipment

VII. Ethical and medicolegal issues 5%
A. ACNS guidelines
B. AANEM guidelines
C. AAN guidelines
D. Medicare rules for interpretation
E. Real time review issues
F. Other

General Clinical Neurophysiology Track Content Outline

The General CNP track will include short segments of neurophysiologic studies (EEG, evoked potentials, etc.), with one or more multiple-choice questions for each sample. Additional multiple choice questions will cover technical aspects of recording and clinical correlation.

I. Electroencephalography 50%
A. Physiology of normal and abnormal waveforms
B. Instrumentation and acquisition procedures (include quantitative EEG)
C. Normal patterns of various ages in wake, drowsy, and sleep states
D. Neonatal normal and abnormal patterns
E. Activating procedures (hyperventilation, photic stimulation)
F. Drug effects
G. Focal abnormalities
H. Diffuse abnormalities
I. Coma and brain death
J. Epileptiform abnormalities
K. Benign EEG variants and patterns of unknown significance
L. Artifacts

II. Epilepsy Monitoring 25%
   A. Correlate interictal EEG with seizure type / epilepsy syndrome
   B. Localization and propagation of epileptogenic foci (children, adults)
   C. Correlation of behavioral and electrographic changes
   D. Identify and localize neonatal seizures
   E. Nonepileptic events (physiologic and psychogenic)
   F. Plan and interpret intracranial monitoring
   G. Evaluate patients for epilepsy surgery

III. Evoked Potentials 5%
   A. Visual evoked potentials (pattern reversal)
   B. Brain stem auditory evoked potentials
   C. Short latency somatosensory evoked potentials
      a. Stimulus and recording techniques
      b. Criteria for identification of major waveform components
      c. Criteria for normal and abnormal evoked potentials for adults and children
      d. Presumed generator sources of major waveform components
      e. Clinical significance of various evoked potential abnormalities
      f. Technical and non-pathologic factors that influence evoked potentials and affect interpretation

IV. Sleep 10%
   A. Recognition of sleep stages
   B. Identification of examples showing the effects of age, physiological and environmental variables, and disease on sleep architecture
   C. Interpretation of multiple sleep latency studies
   D. Identification of polysomnographic findings in sleep-related disorders
   E. Montages, special instrumentomgraphic and other technological aspects of sleep studies

V. Intraoperative Monitoring 10%
   A. SEP monitoring for spinal cord, brainstem and cerebral surgery
   B. BAEP monitoring techniques for eighth nerve and brainstem surgery
   C. EEG monitoring for cerebral surgery
   D. Motor evoked potential monitoring for spinal cord surgery
   E. Cranial nerve monitoring
   F. Criteria for decision making
Critical Care EEG Monitoring Track
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
American Board of Clinical Neurophysiology
Recertification Content Outline

I. EEG
   45%
   A. Epileptiform
   B. Normal awake
   C. Normal sleep
   D. Artifacts
   E. Focal (non epileptiform) abnormalities
   F. Encephalopathy or coma
   G. Pediatric and neonate

II. LTM
   15%
   A. Semiology
      1. Epileptic
      2. Non-epileptic
   B. Ictal EEG
      1. Epileptic
      2. Non-epileptic
   C. Intracranial EEG
   D. Presurgical Correlation
   E. Neonatal seizures

III. Evoked Potentials
   15%
   A. VEP
      1. Normal
      2. Abnormal
   B. SSEP
      1. Normal
      2. Abnormal
   C. BAEP
      1. Normal
      2. Abnormal

IV. Sleep
   15%
   A. PSG
      1. Normal / Staging
      2. Apneas
         a. central
         b. obstructive
         c. mixed
      3. PLM
      4. Other
   B. MSLT
V. Intraoperative Monitoring  
A. Spine  
B. Carotid  
C. Intracranial vascular  
D. Functional surgery, mapping  
E. CP angle cases  
F. IOM Anesthesia  
G. Billing/ethics/involvement