CERTIFICATION EXAMINATION IN NEUROLOGY WITH SPECIAL QUALIFICATION IN CHILD NEUROLOGY

The American Board of Psychiatry and Neurology, Inc. (ABPN) is a not-for-profit corporation dedicated to serving the public interest and the professions of psychiatry and neurology by promoting excellence in practice through certification and continuing certification processes.

The ABPN designs and develops the initial certification examination in neurology with special qualification in child neurology to assess the knowledge and reasoning skills needed to provide high quality patient care in the broad domain of the specialty. It utilizes two-dimensional content specifications. Within the two-dimensional format, one dimension is comprised of disorders and topics while the other is comprised of competencies and mechanisms that cut across the various disorders of the first dimension. By design, the two dimensions are interrelated and not independent of each other. All the questions on the examination will fall into one of the disorders/topics and will be aligned with a competency/mechanism. For example, an item on fragile X syndrome could focus on treatment or systems-based practice.

The initial certification examination in neurology with special qualification in child neurology is comprised of 60% child neurology questions and 40% adult neurology questions.

Candidates should use the detailed content outline as a guide to prepare for the initial certification examination. Scores for these examinations will be reported in a standardized format.

For more information, please contact us at questions@abpn.org or visit our website at www.abpn.org

CERTIFICATION EXAMINATION IN NEUROLOGY
WITH SPECIAL QUALIFICATION IN CHILD NEUROLOGY

Content Blueprint

Number of questions: 400		
Dimension 1 **Neurologic Disorders and Topics**		
01.	Headache and pain disorders	7-9%
02.	Epilepsy and episodic disorders	8-12%
03.	Sleep disorders	3-5%
04.	Genetic and developmental disorders	8-12%
05.	Vascular neurology	2-4%
06.	Neuromuscular diseases	8-12%
07.	Movement disorders	4-6%
08.	Demyelinating diseases	5-7%
09.	Neuroinfectious diseases	7-9%
10.	Brain and spinal trauma and spinal diseases	4-6%
11.	Neuro-ophthalmologic and neuro-otologic disorders	2-4%
12.	Metabolic diseases, nutritional deficiency states, and disorders due to toxins, drugs, and physical agents	5-7%
13.	Neuro-oncologic disorders	1-3%
14.	Behavioral neurology and neurocognitive disorders	7-9%
15.	Psychiatric disorders	4-6%
16.	Autonomic nervous system disorders	1-2%
17.	Questions not associated with a specific neurologic disorder	4-6%
18.	Neuroimmunologic and paraneoplastic CNS disorders	1-3%

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Number of questions: 400		
Dimension 2 **Physician Competencies and Mechanisms**		
A.	Neuroscience and mechanism of disease	22-28%
B.	Clinical aspects of neurologic disease	17-23%
C.	Diagnostic procedures	17-23%
D.	Treatment/Management	22-28%
E.	Interpersonal and communication skills	2-3%
F.	Professionalism	2-3%
G.	Practice-based learning and improvement	2-3%
H.	Systems-based practice	2-3%

Content Outline

Dimension 1 Neurologic Disorders and Topics
01. Headache and pain disorders
A. Headache
01. Primary headaches
a. Migraine
b. Tension-type headache
c. Cluster headache and other trigeminal autonomic cephalalgias
d. Paroxysmal hemicrania
xx. Other (exertional headache, etc.)
02. Secondary headaches
a. Headache due to head and neck trauma (posttraumatic headache)
b. Headache due to cranial or cervical vascular disorder (thunderclap headache, reversible cerebral vasoconstriction syndrome (RCVS), arterial dissection, cerebral hemorrhage, ischemia)
c. Headache due to nonvascular intracranial disorder (hydrocephalus, idiopathic intracranial hypertension, increased intracranial pressure and cerebral edema, low-CSF-pressure headaches, tumors)
d. Headache due to infection
e. Headache due to a substance or its withdrawal
f. Headache or facial pain due to disorder of cranium, neck, eyes, ears, nose, sinuses, and teeth
g. Headache due to psychiatric disorder
03. Cranial neuralgia, central and primary facial pain (trigeminal neuralgia, idiopathic facial pain, post-herpetic neuralgia)
B. Pain disorders
01. Central pain syndromes (thalamic, phantom, etc.)
02. Complex regional pain syndromes
02. Epilepsy and episodic disorders
A. Generalized seizures
01. Tonic-clonic (in any combination)
02. Absence
a. Typical
b. Atypical
c. Absence with special features
03. Myoclonic
04. Clonic
05. Tonic
06. Atonic

07. Epileptic spasms
08. Negative myoclonus
09. Myoclonic-atonic
B. Focal seizures
01. Preserved consciousness
02. Impaired consciousness
03. Focal to bilateral tonic-clonic
XX. Other
C. Electroclinical syndromes
01. Neonatal period
a. Self-limited familial neonatal seizures
b. Early infantile developmental and epileptic encephalopathy
i. Early myoclonic encephalopathy
ii. Ohtahara syndrome
c. Symptomatic neonatal seizures
xx. Other early infantile epileptic encephalopathy
02. Infancy
a. Infantile epileptic spasms syndrome
b. Myoclonic epilepsy in infancy
c. Self-limited nonfamilial infantile epilepsy
d. Self-limited familial infantile epilepsy
e. Severe myoclonic epilepsy of infancy (Dravet syndrome)
f. Myoclonic encephalopathy in nonprogressive disorders
g. Epilepsy of infancy with migrating focal seizures
h. Hemiconvulsion-hemiplegia-epilepsy syndrome
xx. Other developmental epileptic encephalopathies with onset in infancy
03. Childhood
a. Febrile seizures plus
b. Self-limited epilepsy with autonomic seizures (Panayiotopoulos syndrome)
c. Epilepsy with myoclonic-atonic seizures
d. Self-limited epilepsy with centrotemporal spikes
e. Sleep-related hypermotor (hyperkinetic) epilepsy
f. Childhood occipital visual epilepsy
g. Epilepsy with myoclonic absences
h. Lennox-Gastaut syndrome
i. Developmental and/or epileptic encephalopathy with spike-and-wave activation in sleep (Landau-Kleffner syndrome)
j. Childhood absence epilepsy
k. Acquired epileptic aphasia, including Landau-Kleffner syndrome

l. GLUT-1 syndrome
m. Photosensitive occipital lobe epilepsy
xx. Other developmental epileptic encephalopathies with onset in childhood
04. Adolescence through adult
a. Juvenile absence epilepsy
b. Juvenile myoclonic epilepsy
c. Epilepsy with generalized tonic-clonic seizures alone
d. Autosomal dominant epilepsy with auditory features
xx. Other familial temporal lobe epilepsies
05. Other benign
06. Other idiopathic
07. Other generalized/multifocal
D. Less specific age relationship
01. Familial focal epilepsy with variable foci
02. Reflex epilepsies
03. Progressive myoclonus epilepsies
04. Mesial temporal lobe epilepsy with hippocampal sclerosis
05. Rasmussen syndrome
06. Focal emotional (gelastic) seizures with hypothalamic hamartoma
E. Epilepsies attributed to and organized by structural-metabolic causes
01. Structural (including tumors, vascular malformations)
02. Infection
03. Trauma
04. Perinatal insults
05. Malformations of cortical development (including neurocutaneous syndromes)
06. Mitochondrial and metabolic disorders
07. Stroke
08. Genetic epilepsies
F. Unknown whether focal or generalized
G. Conditions with epileptic seizures traditionally not diagnosed as a form of epilepsy
01. Benign neonatal seizures
02. Febrile seizures
03. Provoked seizures
04. Eclampsia
05. Single unprovoked seizures
H. Nonepileptic paroxysmal disorders
01. Syncope and anoxic seizures
02. Functional seizures and other behavioral, psychological, and psychiatric disorders
03. Sleep-related conditions

04. Paroxysmal movement disorders
05. Migraine-associated disorders
06. Miscellaneous events
XX. Other
I. Status epilepticus
01. Convulsive
02. Nonconvulsive
03. Focal motor
04. Tonic status
05. Febrile
06. Refractory and super-refractory
XX. Unknown
03. Sleep disorders
A. Insomnia
01. Psychological insomnia
02. Inadequate sleep hygiene
B. Sleep-disordered breathing
01. Obstructive sleep apnea
02. Central apnea syndromes
03. Sleep-related hypoventilation disorders
C. Central disorders of hypersomnolence
01. Narcolepsy (with and without cataplexy)
02. Kleine-Levin syndrome
03. Hypersomnia due to a medical condition
04. Insufficient sleep syndrome
D. Circadian rhythm sleep-wake disorders
01. Delayed sleep-wake phase disorder
02. Advanced sleep-wake phase disorder
03. Irregular sleep-wake rhythm disorder
04. Non-24-hour sleep-wake phase disorder
E. Parasomnias
01. Non-REM-related parasomnias
a. Arousal disorders
i. Sleepwalking
ii. Sleep terrors
iii. Confusional arousals
b. Sleep-related eating disorder
02. REM-related parasomnias
a. REM sleep behavior disorder

b. Recurrent isolated sleep paralysis
c. Nightmare disorder
03. Other
a. Exploding head syndrome
b. Sleep-related hallucinations
c. Sleep enuresis
d. Parasomnia due to a general medical disorder
e. Medication/substance-related parasomnia
f. Unspecified parasomnia
F. Sleep-related movement disorders
01. Periodic limb movements of sleep
02. Sleep-related limb cramps
03. Sleep-related bruxism
04. Benign myoclonus of infancy
G. Sleep disorders in other conditions
01. Sleep disturbances in movement conditions
a. Parkinson disease
b. Multisystem atrophy
c. Dementia with Lewy bodies
d. Spinocerebellar degeneration
e. Huntington disease
02. Neuromuscular disorders (amyotrophic lateral sclerosis, myasthenia gravis, muscular dystrophy, and others)
03. Alzheimer disease
04. Effects of sleep disorders on cardiovascular/cerebrovascular risk factors
a. Hypertension
b. Atrial fibrillation
c. Congestive heart failure
d. Myocardial infarction
e. Stroke
04. Genetic and developmental disorders
A. Heritable disorders of metabolism
01. Disorders of amino acid metabolism and transport
a. Phenylketonuria
b. Nonketotic hyperglycinemia (glycine encephalopathy)
c. Maple syrup urine disease
d. Homocystinuria
e. Tyrosinemia
f. Hartnup disease

xx. Other
02. Disorders of organic acid metabolism
a. Methylmalonic acidemia
b. Propionic acidemia
c. Glutaric acidemia
xx. Other
03. Disorders of urea metabolism
a. Ornithine transcarbamylase deficiency
b. N-acetylglutamate synthase deficiency
c. Carbamoyl phosphate synthetase 1 deficiency
d. Citrullinemia
e. Argininosuccinic aciduria
f. Argininemia
g. Hyperornithinemia-hyperammonemia-homocitrullinuria (HHH) syndrome
xx. Other
04. Disorders of monosaccharide metabolism and transport
a. Galactosemia
b. Glucose transporter deficiency
c. Other
05. Mitochondrial disorders
a. Myoclonic epilepsy with ragged red fibers (MERRF)
b. Mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS)
c. Kearns-Sayre syndrome
d. Mitochondrial neurogastrointestinal encephalomyopathy (MNGIE)
e. Leigh syndrome
f. Leber hereditary optic neuropathy
g. Progressive external ophthalmoplegia
xx. Other
06. Peroxisomal disorders
a. Zellweger syndrome
b. Adrenoleukodystrophy and adrenomyeloneuropathy
c. Other
07. Disorders of purine metabolism
a. Lesch-Nyhan syndrome
b. Other
08. Lysosomal disorders
a. Glycogen storage diseases
i. Pompe disease (Type II; acid maltase deficiency)

ii. Other
b. Mucopolysaccharidoses
i. Hunter syndrome
ii. Hurler syndrome
iii. Sanfilippo syndrome
iv. Morquio syndrome
v. Maroteaux-Lamy syndrome
xx. Other
c. Sphingolipidoses and gangliosidoses
i. GM1 gangliosidosis
ii. Tay-Sachs disease (early onset GM2 gangliosidosis)
iii. Sandhoff disease (late onset GM2 gangliosidosis)
iv. Fabry disease
v. Niemann Pick disease
vi. Gaucher disease
vii. Krabbe disease
viii. Metachromatic leukodystrophy
xx. Other
09. Other genetic disorders
a. Pelizaeus-Merzbacher disease
b. Alexander disease
c. Canavan disease
d. Porphyria
e. Disorders of iron metabolism (e.g., PKAN)
f. Disorders of copper metabolism (e.g., Wilson disease)
g. Disorders of neurotransmitter metabolism (e.g., SSADH)
h. Neuronal ceroid lipofuscinosis
i. Disorders of cholesterol metabolism
xx. Other
XX. Other
B. Chromosomal disorders
01. Autosomal abnormalities
a. Down syndrome (trisomy 21)
b. Trisomy 13
c. Cri du chat syndrome
d. Uniparental disomy syndromes
i. Angelman syndrome
ii. Prader-Willi syndrome
iii. Other

e. Williams syndrome
f. 22q11.2 deletion syndrome (DiGeorge syndrome)
xx. Other
02. X-chromosomal disorders
a. Fragile X syndrome
b. Turner syndrome
c. Other
03. Other
C. Sporadic, gene-related disorders
01. Rett syndrome
02. Other
D. Developmental disorders of skull and brain structure
01. Anencephaly
02. Encephalocele
03. Cerebellar and brainstem malformations
a. Chiari malformations
b. Cerebellar hypoplasia
c. Joubert syndrome
d. Dandy Walker and related variants
xx. Other
04. Cerebral malformations
a. Holoprosencephaly
b. Septo-optic dysplasia
c. Schizencephaly
d. Migrational abnormalities (including lissencephaly)
e. Agenesis of the corpus callosum
f. Hemimegalencephaly
xx. Other
05. Abnormalities of brain and/or head size
a. Microencephaly and microcephaly
b. Macroencephaly and macrocephaly (including related systemic overgrowth syndromes)
c. Other
06. Abnormalities of brain CSF spaces
a. Hydrocephalus
b. Cystic malformations (including arachnoid, colloid, pineal, dermoid, epidermoid)
c. Other
07. Spinal cord malformations (dysraphism)
a. Syringomyelia

b. Diastematomyelia
c. Tethered cord
xx. Other
E. Neurocutaneous syndromes
01. Neurofibromatosis 1 and 2
02. Tuberous sclerosis
03. Sturge-Weber syndrome
04. Ataxia-telangiectasia
05. Von Hippel-Lindau disease
06. Incontinentia pigmenti
XX. Other
F. Cerebral palsy
01. Spastic cerebral palsy
02. Dyskinetic/dystonic cerebral palsy
03. Ataxic cerebral palsy
XX. Other
G. Teratogens
H. Multiple congenital anomalies
XX. Other
05. Vascular neurology
A. Ischemic stroke (cerebral infarction and transient ischemic attack)
01. Atherosclerosis
a. Large-artery
b. Small-artery
02. Cardioembolic
03. Arterial dissection
04. Other vasculopathies, including vasculitis
a. Noninflammatory
b. Infectious
c. Inflammatory
05. Spinal cord infarction/ischemia
XX. Other
B. Intracerebral hemorrhage
01. Chronic hypertension
02. Vascular malformations
03. Bleeding diatheses and antithrombotic agents
04. Cerebral amyloid angiopathy
05. Hemorrhagic tumors
06. Pituitary apoplexy

07. Locations of intracerebral hemorrhage
XX. Other
C. Subarachnoid hemorrhage
01. Aneurysm
02. Vascular malformations
03. Complications (including vasospasm)
04. Trauma
D. Cerebral venous thrombosis
01. Pregnancy and puerperium
02. Hypercoagulability (thrombophilia)
03. Cavernous sinus thrombosis
XX. Other
E. Reversible cerebrovascular constriction syndrome (RCVS) and posterior reversible encephalopathy syndrome (PRES)
F. Sickle cell disease
G. Unruptured brain aneurysm or unruptured vascular malformation
H. CADASIL
I. Primary intraventricular hemorrhage
J. Carotid cavernous or dural fistulas
K. Cardiovascular diseases
L. Stroke genetics
M. Prothrombotic (hypercoagulable) causes of stroke
N. Hypoxic-ischemic encephalopathy
XX. Other
06. Neuromuscular diseases
A. Motor neuron disorders
01. Sporadic
a. Amyotrophic lateral sclerosis
i. Progressive muscular atrophy
ii. Primary lateral sclerosis
iii. Progressive bulbar palsy
02. Genetic
a. Familial amyotrophic lateral sclerosis
b. Spinal muscular atrophy
c. Spinobulbar muscular atrophy (Kennedy disease)
d. Tay-Sachs disease
e. Distal hereditary motor neuropathy
03. Focal, including monomelic amyotrophy (Hirayama disease)
04. Paraneoplastic

05. Toxic
a. Lathyrism
06. Infectious
a. Polio
b. Rabies
c. West Nile virus
d. Tetanus
e. Enterovirus D68 (EV-D68)
B. Spinal root disorders
01. Cervical
02. Thoracic
03. Lumbosacral
04. Polyradiculopathy
05. Myeloneuropathy
C. Plexopathies
01. Brachial
a. Traumatic (neonatal, penetrating injury)
b. Radiation-induced
c. Neuralgic amyotrophy (brachial neuritis)
d. Hereditary neuralgic amyotrophy
e. Neoplastic
f. Neurogenic thoracic outlet syndrome
xx. Other
02. Lumbosacral
a. Traumatic (hematoma, ischemic)
b. Radiation-induced
c. Diabetic radiculoplexus neuropathy
d. Neoplastic
xx. Other
D. Peripheral nerve disorders
01. Mononeuropathies
02. Mononeuropathy multiplex
03. Polyneuropathy
a. Hereditary
i. Demyelinating
(a) CMT1a
(b) CMTX
(c) Hereditary neuropathy with tendencies to pressure palsy (HNPP)

(d) Refsum disease
(e) Metachromatic leukodystrophy
ii. Axon loss
(a) CMT2
(b) Adrenoleukodystrophy
iii. TTR amyloid polyneuropathy
iv. Porphyric neuropathy
b. Acquired
i. Immune mediated
(a) Guillain-Barré syndrome
(i) Acute inflammatory demyelinating polyradiculoneuropathy (AIDP)
(ii) Miller Fisher variant (GQ1b antibody)
(iii) Acute motor axonal neuropathy
(iv) Acute motor and sensory axonal neuropathy
(v) Pharyngeal-cervical-brachial
(b) Chronic inflammatory demyelinating polyradiculoneuropathy (CIDP)
(c) Multifocal mononeuropathy with conduction block
(d) Distal acquired demyelinating symmetric neuropathy (DADS)
(e) Multifocal acquired demyelinating sensory and motor polyneuropathy (MADSAM)
(f) Paraneoplastic
(g) Amyloidosis
(h) Sarcoidosis
(i) Paraproteinemic
ii. Metabolic
(a) Diabetic
(b) Nutritional
(i) Vitamin B6 deficiency
(ii) Vitamin B12 deficiency
(iii) Copper deficiency
(iv) Alcohol
(v) Hypervitaminosis B6
(xx) Other
(c) Critical illness
iii. Toxic
(a) Arsenic, lead, thallium
(b) n-Hexane

(c) Organophosphates
(d) Drug-induced
(xx) Other
iv. Infectious
(a) Diphtheria
(b) HIV
(c) Leprosy
(d) Lyme disease
(e) Syphilis
(xx) Other
c. Dorsal root ganglion disorders
i. Nutritional/toxic, including hypervitaminosis B6
ii. Autoimmune/inflammatory
(a) Hu antibody syndrome
(b) Connective tissue disease (Sjögren syndrome)
iii. Friedreich ataxia
iv. Idiopathic
d. Small fiber neuropathy
E. Neuromuscular junction transmission disorders
01. Myasthenia gravis
02. Lambert-Eaton myasthenic syndrome
03. Botulism
04. Congenital/hereditary myasthenia
05. Medication-induced
XX. Other
F. Muscle disorders
01. Hereditary
a. Muscular dystrophies
i. Duchenne/Becker
ii. Facioscapulohumeral
iii. Limb-girdle
(a) Type 1
(b) Type 2
iv. Myotonic
(a) Myotonic dystrophy 1 (including distal presentation)
(b) Myotonic dystrophy 2
v. Oculopharyngeal
vi. Myofibrillar (including distal presentation)
vii. Congenital muscular dystrophy

b. Congenital myopathies
i. Central core
ii. Nemaline
iii. Centronuclear/myotubular (including distal presentation)
xx. Other
c. Metabolic myopathies
i. Mitochondrial
(a) Myoclonic epilepsy with ragged red fibers (MERRF)
(b) Mitochondrial myopathy, lactic acid, and stroke (MELAS)
(c) Kearns-Sayre syndrome
(xx) Other
ii. Glycogenoses
(a) Pompe disease/Acid maltase deficiency
(b) Myophosphorylase deficiency (McArdle disease)
(c) Other
iii. Lipidoses
(a) Carnitine deficiency
(b) Carnitine palmitoyltransferase 2 deficiency (CPT2)
(c) Other
d. Periodic paralyses/channelopathies
i. Hypokalemic
ii. Hyperkalemic
iii. Andersen-Tawil syndrome
iv. Nondystrophic myotonias
02. Acquired
a. Inflammatory myopathies
i. Polymyositis
ii. Dermatomyositis
iii. Inclusion body myositis
(a) Sporadic (including distal presentation)
(b) Hereditary (including distal presentation)
iv. Sarcoidosis
v. HIV
b. Critical illness myopathy
c. Toxic/drug-induced myopathy
i. HMG-CoA reductase
ii. Alcohol
iii. Chloroquine/hydroxychloroquine
iv. Corticosteroids

v. Colchicine
vi. Antiretroviral medications
d. Metabolic/endocrine
i. Hypothyroid
ii. Hyperthyroid
iii. Hypokalemic
iv. Cushing disease
e. Necrotizing autoimmune myopathy
i. Anti-HMG-CoA reductase myopathy
ii. Anti-signal recognition particle (anti-SRP)
03. Rhabdomyolysis
04. Abnormalities of muscle tone
a. Hypotonia
b. Spasticity
c. Rigidity
G. Hyper-excitability disorders
01. Stiff-person syndrome
02. Potassium channelopathies (including Isaacs syndrome)
H. Autonomic dysfunction in neuromuscular diseases
01. Autoimmune autonomic neuropathy and ganglionopathy (including Sjögren syndrome)
02. Guillain-Barré syndrome (autonomic manifestations)
03. Paraneoplastic autonomic neuropathies
04. Fabry disease
05. Autonomic neuropathies due to infectious disease
a. American trypanosomiasis Chagas disease
b. Leprosy
c. Diphtheria
d. HIV
06. Diabetes (autonomic manifestations)
07. Amyloidosis
08. Tonic pupil (Adie syndrome)
09. Small fiber polyneuropathy (autonomic manifestations)
10. Toxic neuropathies
a. Vacor
b. Hexane
c. Ciguatoxin
d. Vincristine
e. Cisplatin, paclitaxel

f. Heavy metals (e.g., arsenic, mercury, thallium)
g. Postural orthostatic tachycardia syndrome (POTS)
xx. Other
XX. Other
07. Movement disorders
A. Parkinson disease and parkinsonism
01. Neurodegenerative
a. Idiopathic Parkinson disease
i. Dementia with Lewy bodies
b. Multiple system atrophy
c. Progressive supranuclear palsy
d. Corticobasal degeneration
02. Posttraumatic parkinsonism
03. Vascular parkinsonism
04. Drug-induced parkinsonism
05. Hydrocephalus and normal-pressure hydrocephalus
06. Juvenile parkinsonism
B. Tremor
01. Essential tremor
02. Physiological tremor
03. Drug-induced tremor
C. Chorea
01. Huntington disease
02. Sydenham chorea
03. Drug-induced chorea
04. Chorea gravidarum
05. Neuroacanthocytosis
D. Ballism and athetosis
E. Dystonia
01. Focal dystonia
a. Genetic
b. Nongenetic
02. Generalized dystonia
a. Genetic
b. Nongenetic
03. Dopa-responsive dystonia
XX. Other
F. Hepatolenticular degeneration (Wilson disease)
G. Neuroleptic-induced syndromes, acute and chronic

01. Acute dystonic reaction
02. Tardive syndromes
H. Tic disorders
01. Tourette syndrome
02. Other
I. Myoclonus
01. Essential myoclonus
02. Post-hypoxic myoclonus
J. Other paroxysmal disorders
01. Hemifacial spasm
02. Dyskinesias
03. Restless legs syndrome
04. Automatisms
05. Stereotypies
K. Ataxia
01. Spinocerebellar ataxias
02. Friedreich ataxia
03. Vitamin
04. Paroxysmal ataxia
L. Functional movement disorders
01. Tremor
02. Dystonia
03. Gait disturbance and ataxia
M. Critical care
01. Acute parkinsonism
02. Neuroleptic malignant syndrome
03. Serotonin syndrome
04. Dystonic storm
05. Ballism
06. Tic status
08. Demyelinating diseases
A. Multiple sclerosis and variants
B. Neuromyelitis optica
C. Acute disseminated encephalomyelitis and variants
D. Transverse myelitis
XX. Other
09. Neuroinfectious diseases
A. Bacterial infections
01. Meningitis

a. Neonatal
i. E. coli
ii. Streptococcus
iii. Listeria
xx. Other
b. Childhood
i. Hemophilus influenza
ii. Streptococcus pneumonia
iii. Other
c. Adolescent
i. Neisseria meningitis
ii. Other
d. Adult
i. Streptococcus pneumonia
ii. Listeria
iii. Other
02. Brain and spine abscesses (Epidural and subdural abscesses including disc space infection, osteomyelitis, and empyema)
03. Congenital
B. Fungal infections
01. Meningitis
a. Cryptococcus
b. Histoplasmosis
c. Coccidiomycosis
xx. Other
02. Cerebritis
a. Aspergillosis
b. Phycomycosis
c. Other
03. Congenital
C. Mycobacteria, including tuberculosis
D. Viral infections
01. Meningitis
02. Encephalitis and myelitis
a. West Nile virus
b. Herpesvirus
i. Simplex
ii. Varicella zoster
iii. HHV-6

iv. Cytomegalovirus
xx. Other
c. Arbovirus
d. Rabies
e. HIV
f. Progressive multifocal leukoencephalopathy
g. Polio
i. Acute flaccid paralysis/Polio-like syndrome
h. Measles
xx. Other
03. Congenital
E. Protozoan infections
01. Toxoplasmosis
02. Naegleria
03. Trypanosomiasis
XX. Other
F. Parasitic infections
01. Cysticercosis
02. Malaria
03. Congenital
XX. Other
G. Prion infections [e.g., subacute spongiform encephalopathy (Creutzfeldt-Jakob disease), others]
H. Noninfectious causes of meningitis
I. Systemic infections with neurologic effects
01. Lyme disease
02. Syphilis
03. Diphtheria
04. Tetanus
05. Intestinal lipodystrophy (Whipple disease
06. Leprosy
XX. Other
10. Brain and spinal trauma and spinal cord disorders
A. Brain trauma
01. Cerebral concussion, including chronic traumatic encephalopathy
02. Diffuse axonal injury
03. Cerebral contusion
04. Traumatic hemorrhage
a. Epidural hematoma

b. Subdural hematoma
c. Traumatic subarachnoid hemorrhage
05. Increased intracranial pressure and herniation syndromes
B. Spinal trauma
01. Spinal cord contusion and transection
02. Spinal epidural hematoma
C. Nontraumatic spinal cord disorders
01. Spinal cord/myelopathy (e.g., compression, other)
02. Spinal cord herniation
03. Associated autonomic disorders
04. Cauda equina (e.g., compression, other)
05. Spinal cord infarction
06. Vascular myelopathies
07. Spinal cord vascular malformations
XX. Other (e.g., hereditary spastic paraparesis)
D. Abusive head trauma
E. Myeloneuropathy
11. Neuro-ophthalmologic and neuro-otologic disorders
A. Neuro-ophthalmology
01. Disorders of the optic nerve
a. Vascular (e.g., anterior ischemic optic neuropathy)
b. Inflammatory (e.g., optic neuritis)
c. Toxic and nutritional optic nerve disease
d. Inherited (e.g., Leber optic atrophy)
e. Papilledema and pseudopapilledema
f. Optic nerve tumor
02. Disorders of the retina
a. Retinal artery occlusion, including Susac syndrome
b. Retinal venous occlusion
c. Retinal degenerations
d. Phakomatoses
03. Other lesions of optic pathways
a. Optic chiasm
b. Optic tracts
c. Optic radiations
d. Visual cortex, including visual agnosias and cortical blindness
04. Disorders of the pupil
a. Horner syndrome
b. Argyll-Robertson pupil

c. Tonic pupil (Adie syndrome)
05. Disorders of ocular motility
a. Disorders of supranuclear control of eye movements
i. Horizontal gaze paresis, including internuclear ophthalmoplegia and one-and-a-half syndrome
ii. Upgaze paresis (e.g., Parinaud syndrome
iii. Downgaze paresis
b. Disorders of cranial nerves 3,4, 6, and their nuclei
c. Nystagmus
d. Cavernous sinus disorders
e. Extraocular disorders
f. Electroclinical syndromes
g. Cerebral/cortical visual impairment
h. Strabismus
i. Congenital cataracts
j. Congenital glaucoma
xx. Other
06. Intraocular manifestations of stroke
B. Neuro-otology
01. Vestibular disease
a. Benign paroxysmal positional vertigo
b. Idiopathic endolymphatic hydrops (Ménière disease)
c. Acute labyrinthitis
d. Toxic vestibulopathy
e. Cerebellopontine angle tumors
f. Central vertigo, including disembarkment syndrome
g. Benign paroxysmal vertigo of childhood
h. Acute vestibular syndrome
02. Hearing loss, including inherited and acquired
a. Sensorineural
b. Conductive
c. Central auditory processing disorder
03. Carotid body tumors (chemodectomas/paragangliomas)
XX. Other, including pulsatile tinnitus
12. Metabolic diseases, nutritional deficiency states, and disorders due to toxins, drugs, and physical agents
A. Metabolic diseases
01. Hypoxic-ischemic encephalopathy
02. Disorders of glucose metabolism, including hypoglycemia, diabetic ketoacidosis, and nonketotic hyperglycemia

03. Hepatic encephalopathy
04. Uremic encephalopathy, including dialysis dementia and dialysis dysequilibrium syndrome
05. Disorders of sodium, potassium, and water metabolism, including hyponatremia, hypernatremia, hypokalemia, and hyperkalemia
06. Disorders of calcium and magnesium metabolism, including hypocalcemia, hypercalcemia, hypomagnesemia, and hypermagnesemia
07. Endocrine diseases, including those of thyroid, parathyroid, adrenal, and pituitary glands (including pituitary apoplexy)
08. Drug overdose
09. Hyperbilirubinemia
B. Nutritional deficiency states
01. B vitamins
a. Thiamine (including Wernicke encephalopathy)
b. Niacin
c. Pyridoxine
d. Cobalamin
e. Folic acid
f. Biotin
02. Vitamin E
03. Vitamins A and D
04. Copper
05. Protein calorie malnutrition
06. Strachan syndrome and related disorders
07. Complications of bariatric surgery
XX. Other
C. Toxins, drugs, and physical agents
01. Exposure to chemicals
a. Acrylamide
b. Carbon disulfide
c. Ethylene oxide
d. Hexacarbon solvents
e. Organophosphates
f. Toluene
g. Carbon monoxide
xx. Other
02. Exposure to metals
a. Aluminum
b. Arsenic
c. Lead

d. Manganese
e. Mercury
f. Thallium
g. Tin
xx. Other
03. Effects of drug abuse
a. Opioids
b. Cocaine
c. Amphetamines
d. Sedative-hypnotics
e. Inhalants
f. Hallucinogens
xx. Other
04. Effects of alcohol
a. Acute alcoholic intoxication
b. Alcohol withdrawal syndromes
c. Effects related to nutritional deficiency
d. Effects of unknown etiology (e.g., Marchiafava-Bignami disease)
e. Effects of alcohols other than ethanol (e.g., methyl alcohol and ethylene glycol)
f. Fetal exposure to alcohol
05. Effects of ionizing radiation
a. Encephalopathy
b. Myelopathy
c. Plexopathy
06. Hypothermia and hyperthermia
07. Electric current and lightning
08. Animal and insect neurotoxins
a. Snakes
b. Spiders
c. Scorpions
d. Ticks
09. Marine neurotoxins
a. Ciguatera fish
b. Puffer fish
10. Plant neurotoxins
a. Mushrooms
b. Other
D. Iatrogenic/therapeutic drugs

13. Neuro-oncologic disorders
A. Neoplasms
01. Primary
a. Primitive neuroectodermal tumors
i. Medulloblastoma
ii. Retinoblastoma
b. Gliomas
i. Astrocytoma
(a) Low-grade
(i) Pilocytic astrocytoma
(ii) Astrocytoma
(b) High-grade
(i) Anaplastic astrocytoma
(ii) Glioblastoma
ii. Oligodendroglioma
(a) Oligodendroglioma
(b) Anaplastic oligodendroglioma
iii. Ependymoma
(a) Ependymoma
(b) Anaplastic ependymoma
(c) Myxopapillary ependymoma
c. Neuronal tumors
i. Central neurocytoma
ii. Dysembryoplastic neuroectodermal tumor
iii. Gangliocytoma
iv. Ganglioglioma
d. Meningioma
e. Nerve sheath tumors
i. Schwannoma
ii. Neurofibroma
f. Primary CNS lymphoma
g. Craniopharyngioma
h. Pituitary adenoma
i. Pineal tumors
j. Choroid plexus tumors
k. Hypothalamic tumors
xx. Other
02. Secondary
a. Metastatic intraparenchymal

b. Meningeal carcinomatosis
c. Metastases to spine and skull
B. Hereditary tumor syndromes
01. Neurofibromatosis
02. Von Hippel-Lindau disease
03. Tuberous sclerosis
04. Cowden syndrome
05. Multiple endocrine neoplasms
C. Nonmetastatic neurologic complications of systemic cancer
01. Vascular disease
D. Neurologic complications of cancer treatment
01. Radiation therapy
a. Radiation necrosis
b. Secondary neoplasms
02. Chemotherapy
14. Behavioral neurology and neurocognitive disorders
A. Delirium, dementia, and other cognitive disorders
01. Delirium
a. Delirium due to a medical condition
b. Substance intoxication delirium
c. Substance withdrawal delirium
d. Delirium due to multiple etiologies
xx. Other
02. Dementia
a. Mild cognitive impairment
b. Alzheimer disease
c. Vascular dementia
d. HIV
e. Traumatic brain injury
f. Frontotemporal disorders
g. Dementia due to a medical condition
h. Substance/medication-induced dementia
i. Multiple etiologies, including metabolic, endocrine, toxic, and neoplastic/paraneoplastic
j. Primary progressive aphasia
k. Dementia with Lewy bodies
l. Cerebral small vessel disease
xx. Other
03. Amnestic disorders (including transient global amnesia)

XX. Other
B. Neurodevelopmental disorders
01. Learning disorders
02. Communication disorders
03. Autism spectrum disorder
04. Attention-deficit and disruptive behavior disorders
05. Cognitive impairment
a. Global developmental delay
b. Intellectual developmental disorder (intellectual disability)
XX. Other
C. Higher cortical function and clinical syndromes
01. Frontal lobe syndromes
02. Aphasia
03. Apraxia
04. Neglect
05. Agnosia
06. Disconnection syndromes
XX. Other
D. Alteration of mental status/encephalopathy/coma/brain death
E. Pseudobulbar affect/pseudobulbar palsy
XX. Other
15. Psychiatric disorders
A. Schizophrenia and other psychotic disorders
01. Schizophrenia
02. Brief psychotic disorder
03. Psychotic disorder due to another medical condition
04. Substance/medication-induced psychotic disorder
05. Catatonia
XX. Other
B. Depressive disorders
01. Major depressive disorder
02. Persistent depressive disorder (dysthymia)
03. Depressive disorder due to another medical condition
XX. Other
C. Bipolar and related disorders
01. Bipolar I disorder
02. Bipolar II disorder
D. Anxiety disorders
01. Social anxiety

02. Panic disorder
03. Generalized anxiety disorder
04. Anxiety disorder due to another medical condition
05. Substance/medication-induced anxiety disorder
XX. Other
E. Obsessive-compulsive and related disorders
F. Somatic symptom and related disorders
01. Functional neurological disorder
02. Pain disorder
03. Somatic symptom disorder
04. Illness anxiety disorder
05. Factitious disorders
XX. Other
G. Trauma- and stressor-related disorders
01. Posttraumatic stress disorder
02. Acute stress disorder
03. Adjustment disorder
XX. Other
H. Sexual disorders
01. Sexual pain disorders
02. Sexual dysfunction due to a general medical condition
03. Other
I. Feeding and eating disorders
01. Anorexia nervosa
02. Bulimia nervosa
J. Elimination disorders
K. Personality disorders
L. Neurobehavioral disorders
01. Impulse-control and conduct disorders
M. Dissociative disorders (including fugue)
XX. Other psychiatric disorders
16. Autonomic nervous system disorders
A. Disorders of orthostatic tolerance
01. Orthostatic hypotension
02. Postural orthostatic tachycardia syndrome (POTS)
03. Neurally mediated syncope
a. Central causes (emotional)
b. Reflex causes
i. Carotid sinus stimulation

ii. Micturition, defecation, coughing
iii. Hemodynamic stress
B. Autonomic dysfunction in CNS disorders
01. Lewy body disorders
02. Multiple system atrophy
03. Tauopathies
04. Pure autonomic failure
05. Multiple sclerosis
06. Stroke
C. Disorders of sweating and thermoregulation
01. Hypothermia
02. Hyperthermia
03. Regional hyperhidrosis
04. Hypohidrosis (central and peripheral causes)
D. Autonomic disorders of the urogenital system
01. Multiple sclerosis
02. Multiple system atrophy
E. Autonomic disorders of the gastrointestinal tract
01. Achalasia
02. Gastroparesis
03. Cyclic vomiting syndrome
04. Intestinal pseudo-obstruction
05. Hirschsprung disease
F. Visceral sensory disorders
01. Disorders of parasympathetic visceral sensation
a. Disorders of taste
b. Associated with glossopharyngeal neuralgia
02. Disorders of sympathetic visceral sensation (sympathetic storm in spinal cord transection, including autonomic dysreflexia)
03. Disorders of central visceral sensation (insular cortex stroke)
17. Questions not associated with a specific neurologic disorder
A. Normal anatomy, process, neurophysiology
B. Pharmacology
C. Medical-legal, public policy/regulatory factors, professional practice
D. Development through the life cycle: developmental processes, tasks, crises, transitions
01. Infancy
02. Childhood (school entry, peer relations, individuation)
03. Adulthood (employment, parenting, acquisition/loss of specific capacities)
04. Late life (cognition, physical endurance, loss of specific capacities)

E. Procedures/procedural safety
F. Normal test results, findings, variants, artifacts, and methods
18. Neuroimmunologic and paraneoplastic CNS disorders
A. CNS vasculitis and microangiopathies
01. Primary angiitis of the CNS
02. Secondary CNS vasculitis
a. Systemic vasculitides (giant cell arteritis, polyarteritis nodosa, microscopic polyangiitis, Behçet disease)
b. Systemic autoimmune disease (systemic lupus erythematosus, rheumatoid arthritis, Sjögren syndrome, sarcoidosis)
c. Infectious vasculitis (varicella zoster)
d. Substance-induced vasculitis (amphetamines, cocaine)
03. Microangiopathies (e.g., Susac syndrome, Sneddon syndrome)
B. Neuroimmunologic/paraneoplastic CNS syndromes
01. Cerebellar syndromes
02. Encephalitis/encephalomyelitis (anti-NMDA, anti-IL2, limbic, other)
03. Opsoclonus-myoclonus
04. Epilepsy
XX. Other

Dimension 2 Physician Competencies and Mechanisms
A. Neuroscience and mechanism of disease
01. Neuroanatomy
a. Cerebral cortex
b. Connecting systems
c. Basal ganglia/thalamus
d. Brainstem
e. Cerebellum
f. Cranial nerves
g. Spinal cord
h. Spinal roots/peripheral nerves
i. Ventricular system, CSF
j. Vascular
k. Neuromuscular junction/muscle
l. Autonomic nervous system
m. Embryology and neural development
n. Pain pathways
o. Radiologic anatomy, cerebral blood vessels (angiography or MRA)
p. CSF anatomy, physiology, normal and abnormal patterns (cellular, chemical, enzymatic, serologic)
q. Meninges
r. Plexus
xx. Other
02. Neuropathology
a. Basic patterns of reaction
b. Cerebrovascular disease
c. Trauma (cranial and spinal)
d. Metabolic/toxic/nutritional diseases
e. Infections
f. Demyelinating diseases/leukodystrophies
g. Neoplasms
h. Congenital/developmental anomalies
i. Degenerative/heredodegenerative disorders
j. Myopathies
k. Peripheral nerve
l. Neuromuscular junction disorders
m. Radiologic pathology pertinent to assigned pathology sections
n. Medium and large-vessel vasculitis
xx. Other
03. Neurochemistry
a. Carbohydrate metabolism

b.	Lipid metabolism
c.	Protein metabolism
d.	Neurotransmitters
e.	Axonal transport
f.	Energy metabolism
g.	Blood-brain barrier
h.	Biochemistry of membranes/receptors/ion channels
i.	Neuronal excitation
j.	Vitamins (general aspects)
k.	Inborn errors of metabolism
l.	Electrolytes and minerals
m.	Neurotoxins
n.	Free radical scavengers
o.	Excitotoxicity
p.	Normal CSF constituents and volume
xx.	Other
04.	Neurophysiology
a.	Membrane physiology
b.	Synaptic transmission
c.	Sensory receptors and perception
d.	Special senses
e.	Reflexes
f.	Segmental and suprasegmental control of movement
g.	Cerebellar function
h.	Reticular system: mechanisms of sleep and arousal, consciousness, circadian rhythms
i.	Rhinencephalon, limbic system, visceral brain
j.	Learning and memory
k.	Cortical organization and function
l.	Cerebral blood flow
m.	Autonomic function
n.	Blood-brain barrier
o.	Neurophysiology of the visual system
p.	Neurophysiology of hearing and vestibular function
q.	Physiology of pain
r.	Physiology of peripheral nerve and muscle
s.	Coagulation cascade
t.	Metabolic and cellular consequences of ischemia
u.	Inflammation and stroke
xx.	Other
05.	Neuroimmunology/neuroinfectious disease
a.	Pathogenesis of multiple sclerosis

b. Pathogenesis of diseases (including prion diseases)
c. Immunotherapy in multiple sclerosis, myasthenia gravis, and other neurologic disorders
d. Antibody mediated disorders
xx. Other
06. Neurogenetics/molecular neurology, and neuroepidemiology
a. Mendelian-inherited diseases
b. Other modes of inheritance
c. Mitochondrial disorders
d. Nucleotide repeat disorders
e. Channelopathies
f. Genetics of epilepsy
g. Risk factors in neurologic disease
h. Demographics of neurologic disease
07. Neuroendocrinology
a. Thyroid gland
b. Cushing syndrome
c. Corticosteroids
d. Growth hormones
e. Hypothalamic function
f. Adrenal gland
g. Pituitary gland
h. Prolactin
i. Androgen
j. Estrogen
k. Progesterone
08. Pathophysiology
a. Epilepsy
b. Vascular
c. Brain edema and increased ICP
d. Neuromuscular
xx. Other
B. Clinical aspects of neurologic disease
01. Epidemiology
02. Risk factors
a. Risk factors for stroke
b. Risk factors for epilepsy
03. Signs and symptoms
04. Comorbidities
05. Course of illness
06. Prognosis
07. Localization

08. Pregnancy/peripartum
09. Complications of illness
10. Quality of life
C. Diagnostic procedures
01. Neuroimaging
a. Structural imaging (computed tomography, magnetic resonance imaging, and others)
b. Vascular imaging (conventional angiography, computed tomographic angiography, magnetic resonance angiography, ultrasound)
c. Functional neuroimaging, including fMRI, SPECT, PET, others
02. EEG (routine EEG, LTME, subdural and cortical EEGs)
03. Magnetoencephalography
04. Evoked potentials, including intraoperative monitoring
05. Sleep studies
06. EMG/NCS, including single fiber EMG (SFEMG)
07. Autonomic function testing
08. CSF examination/lumbar puncture
09. Laboratory studies
10. Neuropsychological and cognitive testing
11. Cardiac testing
12. Skin/nerve/muscle biopsy
13. Genetic testing
14. Neurophysiologic properties and instrumentation
15. Testing of special senses (e.g., hearing, vision)
16. Clinical/disease severity/rating scales
17. Pulmonary function test
18. Systemic imaging (e.g., CT, MRI, PET)
19. Metabolic testing
20. Special examination maneuvers
XX. Other
D. Treatment/Management
01. General principles of neuropharmacology
a. Neuropharmacokinetics/neuropharmacodynamics
b. Drug toxicity/adverse effects/idiosyncratic reactions/medication withdrawal/contraindications
c. Drug interactions
d. Pregnancy
i. Teratogenicity/neurodevelopmental effects in offspring
ii. Drug level fluctuations
iii. Breastfeeding
e. Age, gender, and ethnicity issues
f. Pharmacogenomics

g. Mechanisms of action
h. Drug management decisions (initiation, continuation, discontinuation)
02. Pharmacotherapy
a. Drugs for migraine and other headache syndromes
b. Analgesics (nonnarcotic, narcotic, etc.)
c. Antiseizure medications
d. Drugs for sleep disorders
e. Drugs for cerebrovascular disease, including antiplatelet agents, anticoagulants, and thrombolytics
f. Drugs for neuromuscular disorders
g. Drugs for movement disorders
h. Drugs for multiple sclerosis (disease-modifying therapy and symptomatic treatment)
i. Drugs for psychiatric disorders (sedative-hypnotics, antianxiety agents, antidepressants, antipsychotics)
j. Vitamins/minerals/nutrients
k. Immunomodulatory agents, including oral medications, prednisone, IV Ig, and plasma exchange
l. Antimicrobial agents
m. Drugs used for increased intracranial pressure and for brain/spinal cord edema
n. Drugs for autonomic dysfunctions
o. Drugs for dementia/cognition/alertness
p. Spasticity treatments
q. Antineoplastic agents
r. Monotherapy vs polytherapy
s. Hormonal therapies
xx. Other
i. Sedation
ii. Stimulants
iii. Antidotes
03. Endovascular treatment
04. Neuromodulation
a. Vagus nerve stimulation (VNS)
b. Deep brain stimulation (DBS)
c. Transcutaneous electrical nerve stimulation (TENS)
d. Spinal cord stimulation (SCS)
e. Transcranial magnetic stimulation (TMS)
f. Electroconvulsive therapy (ECT)
g. Responsive neurostimulation (RNS)
xx. Other
05. Critical care
06. Surgical treatment/interventions/procedures

07.	Radiation therapy
08.	Rehabilitation
a.	Exercise
b.	Assistive devices
c.	Assistive technologies
d.	Braces
e.	Physical therapy and occupational therapy
f.	Pulmonary
g.	Speech/swallowing
h.	Nutrition management
i.	Principles of neurorehabilitation (e.g. regeneration and plasticity)
j.	Functional assessment
k.	Education
l.	Cognitive therapy
m.	Early intervention
09.	Psychotherapy, biofeedback, behavioral therapy, etc.
10.	Reassurance, observation, lifestyle modification, serial monitoring, etc.
11.	Specific dietary treatment
12.	Genetic counseling
13.	Complications of management
14.	Gene therapy/enzyme replacement therapy/stem cell replacement
15.	Nonsurgical/nonpharmacological
XX.	Other
E.	**Interpersonal and communications skills**
01.	Communication with patients
a.	Communication of progress
02.	Communication with patients' families
03.	Communication with other professionals
04.	Communication with the healthcare team
05.	Communication with the public
06.	Management of conflict
07.	Common errors in communication
08.	Patient and family education
F.	**Professionalism**
01.	Professional behavior
02.	Adherence to ethical principles (e.g., informed consent, research issues, clinical care, admission of errors)
03.	Participation in the professional community
04.	Sensitivity to diverse patient populations
05.	End-of-life issues and brain death
06.	Fatigue management/burnout
G.	**Practice-based learning and improvement**

01. Development and execution of lifelong learning
a. Self-assessment and self-improvement
b. Use of evidence-based guidelines
c. Critical review of scientific literature
02. Formal practice-based quality improvement
H. Systems-based practice
01. Patient safety and the healthcare team
a. Medical errors and their prevention
b. Communication in patient safety
c. Regulatory and educational activities related to patient safety
02. Resource management
a. Parity
b. Access to care
c. Negotiation with payers
03. Community-based care
a. Community-based programs
b. Prevention
c. Recovery and rehabilitation
d. Knowledge of the legal aspects of neurological practice
04. Referral for appropriate consultation/decision-making
05. Working with local and national disease-based and advocacy groups