American Board of Psychiatry and Neurology, Inc.

A Member Board of the American Board of Medical Specialties (ABMS)

CONTINUING CERTIFICATION/MOC COMBINED EXAMINATION IN NEUROLOGY

The American Board of Psychiatry and Neurology, Inc. (ABPN) has issued new, two-dimensional content specifications for the psychiatry, neurology and child neurology continuing certification/MOC examinations. Questions for the psychiatry, neurology and child neurology continuing certification combined examinations will conform to these new 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 of 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 substance use could focus on treatment, or it could focus on systems-based practice.

The psychiatry, neurology and child neurology continuing certification combined content specifications can be accessed from the Combined MOC Exams section of our website.

Candidates should use the new detailed content specifications as a guide to prepare for a continuing certification examination. Scores for these examinations will be reported in a standardized format rather than the previous percent correct format.

The American Board of Psychiatry and Neurology, Inc. 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.

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

CONTINUING CERTIFICATION/MOC COMBINED EXAMINATION IN NEUROLOGY
Content Blueprint

Number of questions: 100		
Dimension 1		
Neurologic Disorders and Topics		
01.	Headache and pain disorders	8-12%
02.	Epilepsy and episodic disorders	8-12%
03.	Sleep disorders	3-5%
04.	Genetic and developmental disorders	6-8%
05.	Vascular neurology	8-12%
06.	Neuromuscular diseases	8-12%
07.	Movement disorders	8-12%
08.	Neuroimmunologic and paraneoplastic disorders of the CNS	8-12%
09.	Neuroinfectious diseases	2-4%
10.	Brain and spinal trauma	2-4%
11.	Neuro-ophthalmologic and neuro-otologic disorders	2-4%
12.	Metabolic diseases, nutritional deficiency states, and disorders due to toxins, drugs, and physical agents	3-5%
13.	Neuro-oncologic disorders	3-5%
14.	Behavioral neurology and neurocognitive disorders	7-9%
15.	Psychiatric disorders	1-2%
16.	Autonomic nervous system disorders	1-3%
17.	Normal structure, process, and development through the life cycle	1-2%

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Number of questions: 100		
Dimension 2		
Physician Competencies and Mechanisms		
A.	Neuroscience and mechanism of disease	4-6%
B.	Clinical aspects of neurologic disease	22-28%
C.	Diagnostic procedures	27-33%
D.	Treatment	27-33%
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%

CONTINUING CERTIFICATION/MOC COMBINED EXAMINATION
IN NEUROLOGY
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. Other primary headaches (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, giant cell arteritis, arterial dissection, cerebral hemorrhage, ischemia)
c. Headache due to nonvascular intracranial disorder (hydrocephalus, idiopathic intracranial hypertension, 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. Neuropathic pain (small fiber neuropathy, post-herpetic neuralgia, radiculopathies)
02. Central pain syndromes (thalamic, phantom, etc.)
03. Complex regional pain syndromes
02. Epilepsy and episodic disorders
A. Generalized seizures
01. Tonic-clonic

02. Absence
a. Typical
b. Atypical
c. Absence with special features
03. Myoclonic
04. Clonic
05. Tonic
06. Atonic
B. Focal seizures
01. Simple partial
02. Complex partial
03. Focal evolving to bilateral convulsive seizure
C. Electro-clinical syndromes
01. Neonatal period
a. Benign familial neonatal seizures (BFNS)
b. Early myoclonic encephalopathy (EME)
c. Ohtohara syndrome
02. Infancy
a. West syndrome
b. Myoclonic epilepsy in infancy
c. Benign infantile seizures
d. Benign familial infantile seizures
e. Dravet syndrome
f. Myoclonic encephalopathy in nonprogressive disorders
03. Childhood
a. Febrile seizures (FS+)
b. Early benign childhood occipital epilepsy (Panayiotopoulos type)
c. Epilepsy with myoclonic-atonic seizures
d. Benign epilepsy with centrotemporal spikes (BECTS)
e. Autosomal dominant nocturnal frontal lobe epilepsy (ADNFLE)
f. Late-onset childhood occipital epilepsy (Gastaut type)
g. Epilepsy with myoclonic absences
h. Lennox-Gastaut syndrome
i. Epileptic encephalopathy with continuous spike-and-wave during sleep (CSWS) including Landau-Kleffner syndrome

j. Childhood absence epilepsy
04. Adolescence through adult
a. Juvenile absence epilepsy (JAE)
b. Juvenile myoclonic epilepsy (JME)
c. Epilepsy with generalized tonic-clonic seizures alone
d. Progressive myoclonic epilepsies (PME)
e. Autosomal dominant partial epilepsy with auditory features (ADPEAF)
f. Other familial temporal lobe epilepsies
D. Less specific age relationship
01. Familial focal epilepsy with variable foci
02. Reflex epilepsies
E. Distinctive constellations
01. Mesial temporal lobe epilepsy with hippocampal sclerosis (MTLE with HS)
02. Rasmussen syndrome
03. Gelastic seizures with hypothalamic hamartoma
F. Epilepsies attributed to and organized by structural-metabolic causes
01. Structural, including tumors in vascular malformations
02. Infection
03. Trauma
04. Perinatal insults
05. Malformations of cortical development, including neurocutaneous syndromes
06. Mitochondrial and metabolic disorders
G. Epilepsies of unknown cause
H. Conditions with epileptic seizures traditionally not diagnosed as a form of epilepsy
01. Benign neonatal seizures (BNS)
02. Febrile seizures (FS)
I. Non-epileptic paroxysmal disorders
01. Breath-holding spells
02. Cardiac etiologies (e.g., prolonged QT interval)
03. Syncope, convulsive and nonconvulsive
04. Gastroesophageal reflux and Sandifer syndrome
05. Gratification phenomena and masturbation
06. Shuddering/shivering
07. Acute confusional migraine
08. Benign infant myoclonus
09. Non-epileptic psychogenic seizures

J. Status epilepticus
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. NREM-related parasomnias
a. Arousal disorders, including sleepwalking, sleep terrors, and confusional arousals
i. Sleepwalking
ii. Sleep terrors
iii. Confusional arousals
b. Sleep-related eating disorder
02. REM-related parasomnias
a. REM 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. Amyotrophic lateral sclerosis
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. Inherited metabolic disorders
01. Disorders of amino acid metabolism
a. Phenylketonuria
b. Nonketotic hyperglycemia
c. Other
02. Disorders of urea cycle metabolism
a. Ornithine transcarbamylase
b. Other
03. Disorders of sulfur amino acids
a. Homocystinuria
b. Other
04. Disorders of amino acid transport
a. Hartnup disease

b. Lowe syndrome
c. Other
05. Disorders of carbohydrate metabolism and transport
a. Galactosemia
b. Glucose transporter deficiency
c. Other
06. Organic acidurias
a. Methylmalonic acidurias
b. Glutaric acidurias
c. Other
07. Disorders of fatty acid oxidation
08. Disorders of purine metabolism
a. Lesch-Nyhan syndrome
b. Other
B. Lysosomal disorders
01. Glycogen storage diseases
a. Pompe disease
b. Mucopolysaccharidoses
c. Other
02. Gangliosidoses
a. Tay-Sachs disease
b. Other
03. Gaucher disease
04. Fabry disease
05. Niemann-Pick disease
06. Other
C. Leukodystrophies
01. Adrenoleukodystrophy
02. Pelizaeus-Merzbacher disease
03. Canavan disease
04. Alexander disease
05. Metachromatic leukodystrophy
06. Krabbe disease
07. Other
D. Additional disorders
01. Rett syndrome

02. Mitochondrial disorders
03. Peroxisomal disorders
04. Other
E. Chromosomal disorders
01. Autosomal abnormalities
a. Down syndrome (trisomy 21)
b. Trisomy 13
c. Cri du chat syndrome
d. Other
F. Disorders of brain and spine development
01. Anencephaly
02. Myelomeningocele and encephalocele
03. Chiari malformations
04. Other cord dysraphism
a. Syringomyelia
b. Diastematomyelia
05. Cerebellar malformations
06. Skull malformations, including craniosynostosis
07. Brain malformations
a. Holoprosencephaly
b. Septo-optic dysplasia
c. Schizencephaly
d. Lissencephaly and other migrational abnormalities
e. Agenesis of the corpus callosum
f. Hemimegalencephaly
08. Microencephaly and micrencephaly
09. Macroencephaly and megalencephaly
10. Hydrocephalus
G. 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
07. Other

H. Cerebral palsy
01. Spastic
02. Dyskinetic
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 hypercoagulability (thrombophilia) and vasculitis
B. Intracerebral hemorrhage
01. Chronic hypertension
02. Vascular malformations
03. Bleeding diatheses and antithrombotic agents
04. Amyloid angiopathy
05. Tumors
C. Subarachnoid hemorrhage
01. Aneurysm
02. Vascular malformations
D. Cerebral venous thrombosis
01. Pregnancy and puerperium
02. Hypercoagulability (thrombophilia)
E. Cerebrovascular constriction, including reversible cerebrovascular constriction syndrome and posterior reversible encephalopathy syndrome (PRES)
F. Sickle cell disease
06. Neuromuscular diseases
A. Motor neuron disorders
01. Amyotrophic lateral sclerosis (sporadic)
02. Genetic
a. Familial amyotrophic lateral sclerosis
b. Spinal muscular atrophy
c. Kennedy disease
d. Tay-Sachs disease

03. Focal, including Hirayama disease
04. Paraneoplastic
B. Spinal root disorders
01. Cervical
02. Thoracic
03. Lumbosacral
04. Polyradiculopathy
05. Specific etiologies
a. Diabetes
b. Segmental herpes zoster and post-herpetic neuralgia
C. Plexopathies
01. Brachial
a. Traumatic (neonatal, penetrating injury)
b. Radiation-induced
c. Neuralgic amyotrophy (brachial neuritis)
d. Hereditary neuralgic amyotrophy
e. Neoplastic
02. Lumbosacral
a. Traumatic (hematoma, ischemic)
b. Radiation-induced
c. Diabetic radiculo-plexo-neuropathy
d. Neoplastic
D. Peripheral nerve disorders
01. Mononeuropathies
a. Median
b. Ulnar
c. Radial
d. Musculocutaneous
e. Axillary
f. Spinal accessory
g. Suprascapular
h. Sciatic
i. Peroneal
j. Tibial
k. Femoral
l. Obturator

m. Facial
n. Trigeminal
o. Other
02. Mononeuropathy multiplex
a. Diabetic
b. Vasculitic
03. Polyneuropathy
a. Hereditary
i. Demyelinating
(a) CMT1a
(b) CMTX
(c) Hereditary neuropathy with tendencies to pressure palsy (HNPP)
(d) Refsum disease
ii. Axon loss (CMT2)
iii. TTR amyloid polyneuropathy
iv. Porphyric neuropathy
b. Acquired
i. Demyelinating
(a) Acute inflammatory demyelinating polyneuropathy (AIDP)
(i) Guillain-Barré syndrome
(ii) Miller Fisher variant (GQ1b antibody)
(iii) Acute motor axonal neuropathy (AMAN)
(iv) Acute motor and sensory axonal neuropathy (AMSAN)
(b) Chronic inflammatory demyelinating polyneuropathy (CIDP)
(c) Multifocal mononeuropathy with conduction block
ii. Metabolic
(a) Diabetic
(b) Nutritional
(i) Vitamin B_6 deficiency
(ii) Vitamin B_{12} deficiency
(iii) Copper deficiency
(iv) Alcohol
(v) Hypervitaminosis B_6
iii. Toxic
(a) Arsenic, lead, thallium
(b) n-Hexane

(c) Organophosphates
(d) Drug-induced
(i) Isoniazide
(ii) Metronidazole
(iii) Nitrofurantoin
(iv) Chloroquine/hydroxychloroquine
(v) Lithium
(vi) Other
(e) Other
iv. Immune/inflammatory
(a) Paraneoplastic
(b) Amyloidosis
(c) Sarcoidosis
(d) Paraproteinemic
v. Small-fiber sensory polyneuropathy
c. Dorsal root ganglion disorders
i. Nutritional/toxic, including hypervitaminosis B_6
ii. Autoimmune/inflammatory
(a) Hu antibody syndrome
(b) Connective tissue disease (Sjogren syndrome)
iii. Friedreich ataxia
E. Neuromuscular junction transmission disorders
01. Myasthenia gravis
02. Lambert-Eaton myasthenic syndrome
03. Botulism
04. Congenital/hereditary myasthenia
F. Muscle disorders
01. Muscular dystrophies
a. Duchenne/Becker
b. Facioscapulohumeral
c. Limb-girdle
i. Calpain LGMD 2A
ii. Dysferlin LGMD 2B (including distal presentation)
iii. Sarcoglycan LGMD 2C-F
iv. FKRP LGMD 2I
d. Myotonic

i. Myotonic dystrophy 1 (including distal presentation)
ii. Myotonic dystrophy 2
e. Oculopharyngeal
f. Myofibrillar (including distal presentation)
02. Congenital myopathies
a. Central core
b. Nemaline
c. Centronuclear/myotubular (including distal presentation)
03. Metabolic myopathies
a. Mitochondrial
i. Myoclonic epilepsy with ragged red fibers (MERRF)
ii. Mitochondrial myopathy, lactic acid, and stroke (MELAS)
iii. Kearns-Sayre syndrome
iv. Other
b. Glycogenoses
i. Pompe disease
ii. Myophosphorylase deficiency (McArdle disease)
c. Lipidoses
i. Carnitine deficiency
ii. Carnitine palmitoyltransferase 2 deficiency (CPT2)
d. Periodic paralyses
i. Hypokalemic
ii. Hyperkalemic
04. Acquired myopathies
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
d. Metabolic/endocrine
i. Hypothyroid
ii. Hyperthyroid
iii. Hypokalemic
05. Rhabdomyolysis
G. Hyper-excitability disorders
01. Stiff-person syndromes
02. Potassium channelopathies (Isaac syndrome)
07. Movement disorders
A. Parkinson disease and parkinsonism
01. Neurodegenerative
a. Diffuse Lewy body disease
b. Multiple system atrophy
c. Progressive supranuclear palsy
d. Corticobasal degeneration
02. Post-traumatic 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

02. Childhood-onset dystonia
03. *DYT1* dystonia
04. Myoclonic dystonia
F. Wilson disease
G. Neuroleptic-induced syndromes, acute and chronic
01. Acute dystonic reaction
02. Tardive syndromes
a. Tardive dyskinesia
b. Tardive dystonia
c. Tardive akathisia
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
K. Ataxia
01. Spinocerebellar ataxias
02. Friedreich ataxia
03. Vitamin
04. Paroxysmal ataxia
L. Psychogenic movement disorders
01. Psychogenic tremor
02. Psychogenic dystonia
03. Psychogenic 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. Neuroimmunologic and paraneoplastic disorders of the CNS
A. Demyelinating disease
01. Multiple sclerosis
02. Multiple sclerosis variants (neuromyelitis optica [Devic disease], concentric sclerosis)
03. Acute disseminated encephalomyelitis
04. Transverse myelitis
B. CNS vasculitis
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)
e. Vasculitis mimics (Susac syndrome, Sneddon syndrome, RCVS
09. Neuroinfectious diseases
A. Bacterial infections
01. Meningitis
a. Neonatal
i. E. coli
ii. Streptococcus
iii. Listeria
iiii. 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 abscess
03. Systemic infections with neurologic effects
a. Lyme disease
b. Syphilis
c. Diphtheria
d. Tetanus
e. Whipple disease
B. Fungal infections
01. Meningitis
a. Cryptococcus
b. Histoplasmosis
c. Coccidiomycosis
d. Other
02. Cerebritis
a. Aspergillosis
b. Phycomycosis
c. Other
C. Mycobacteria, including tuberculosis
D. Viral infections
01. Meningitis
02. Encephalitis and myelitis
a. West Nile
b. Herpes simplex
c. Herpes zoster
d. Arbovirus
e. Rabies
f. HIV
g. Progressive multifocal leukoencephalopathy
h. Polio
i. Other
E. Protozoan infections
01. Toxoplasmosis
02. Naegleria
03. Trypanosomiasis
04. Other

F. Parasitic infections
01. Cysticercosis
02. Other
G. Prion infections
10. Brain and spinal trauma
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 hematoma
B. Spinal trauma and skeletal disease
01. Spinal cord contusion and transection
02. Spinal epidural hematoma
03. Spinal cord compression from disc or bone
04. Spinal cord herniation
05. Associated autonomic disorders
11. Neuro-ophthalmologic and neuro-otologic disorders
A. Neuro-ophthalmology
01. Disorders of the optic nerve
a. Vascular (e.g., anterior ischemic optic neuropathy, including giant cell arteritis)
b. Inflammatory (e.g., optic neuritis)
c. Toxic and nutritional optic nerve disease
d. Inherited (e.g., Leber optic atrophy)
e. Papilledema and pseudopapilledema
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
05. Disorders of ocular motility
a. Disorders of supranuclear control of eye movements
i. Horizontal gaze paresis, including internuclear ophthalmoplegia (INO) and one- and-a-half syndrome
ii. Upgaze paresis, including Parinaud syndrome
iii. Downgaze paresis
b. Disorders of cranial nerves 3,4, 6, and their nuclei
c. Nystagmus
B. Neuro-otology
01. Vestibular disease
a. Benign positional vertigo
b. Ménière disease
c. Acute labyrinthitis
d. Toxic vestibulopathy
e. Cerebellopontine angle tumors
f. Central vertigo, including disembarkment syndrome
02. Deafness, including inherited and acquired
03. 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 dementiaand 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
08. Drug overdose
B. Nutritional deficiency states
01. B vitamins
a. Thiamine
b. Niacin
c. Pyridoxine
d. Cobalamin
e. Folic acid
02. Vitamin E
03. Vitamins A and D
04. Other
a. Copper deficiency
b. Protein calorie malnutrition
c. Strachan syndrome and related disorders
d. Complications of bariatric surgery
C. Toxins, drugs, and physical agents
01. Occupational exposure to chemicals
a. Acrylamide
b. Carbon disulfide
c. Ethylene oxide
d. Hexacarbon solvents
e. Organophosphates
f. Toluene
g. Other
02. Occupational exposure to metals
a. Aluminum
b. Arsenic
c. Lead

d. Manganese
e. Mercury
f. Thallium
g. Tin
h. Other
03. Effects of drug abuse
a. Opioids
b. Cocaine
c. Amphetamines
d. Sedative-hypnotics
e. Inhalants
f. Hallucinogens
g. 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)
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. Tick paralysis
09. Marine neurotoxins
a. Ciguatera fish poisoning
b. Puffer fish poisoning
10. Plant neurotoxins
a. Mushroom poisoning

b. Other
13. Neuro-oncologic disorders
A. Neoplasms
01. Primary
a. Primitive neuroectodermal tumors
i. Medullobastoma
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. Dysembryoblastic neuroectodermal tumor (DNET)
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
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 (MEN)
C. Non-metastatic neurologic complications of systemic cancer
01. Paraneoplastic syndromes
a. Cerebellar degeneration
i. Anti-Hu
ii. Anti-Yo
iii. Anti-Ri
iv. Anti-CRMP-5
b. Encephalomyelitis
i. Anti-Hu
ii. Anti-Ri
iii. Anti-CRMP-5
iv. Anti-Ma
v. Anti-NMDAR
c. Opsoclonus-myoclonus (anti-Ri)
d. Sensory neuronopathy (anti-Hu)
e. Neuromuscular junction
f. Muscle
02. 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
e. Other
02. Dementia
a. Mild cognitive impairment
b. Probably Alzheimer disease
c. Vascular dementia
d. HIV disease
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
03. Amnestic disorders
04. Other
B. Neurodevelopmental disorders
01. Learning disorders
02. Communication disorders
03. Autism spectrum disorders
04. Attention-deficit and disruptive behavior disorders
05. Other
C. Higher cortical function and clinical syndromes
01. Frontal lobe syndromes
02. Aphasia
03. Apraxia
04. Neglect
05. Agnosia
06. Disconnection syndromes
D. 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. Other
B. Depressive disorders
01. Depressive disorders
a. Major depressive disorder
b. Persistent depressive disorder (dysthymia)
c. Depressive disorder due to another medical condition
d. Other
C. Bipolar and related disorders
01. Bipolar I disorder
02. Bipolar II disorder
D. Anxiety disorders
01. Panic disorder
02. Obsessive-compulsive disorder
03. Posttraumatic stress disorder
04. Acute stress disorder
05. Generalized anxiety disorder
06. Anxiety disorder due to another medical condition
07. Substance/medication-induced anxiety disorder
08. Other
E. Somatic symptom and related disorders
01. Conversion disorder
02. Pain disorder
03. Somatic symptom disorder
04. Illness anxiety disorder
05. Factitious disorders
06. Other
F. Dissociative disorders
01. Dissociative amnesia
02. Other
G. Sexual disorders
01. Sexual pain disorders
02. Sexual dysfunction due to a general medical condition
03. Other
H. Feeding and eating disorders
01. Anorexia nervosa

02. Bulimia nervosa
I. Elimination disorders
J. Trauma- and stressor-related disorders
K. Other psychiatric disorders
16. Autonomic nervous system disorders
A. Disorders of orthostatic tolerance
01. Orthostatic hypotension
02. Postural 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. Peripheral autonomic neuropathies
01. Autoimmune autonomic neuropathy and ganglionopathy
02. Guillain-Barré syndrome (autonomic manifestations)
03. Paraneoplastic autonomic neuropathies
04. Inherited autonomic neuropathies
a. Fabry disease
b. Porphyria (autonomic manifestations)
05. Autonomic neuropathies due to infectious disease
a. Chagas disease
b. Leprosy
c. Diphtheria
d. Botulism (autonomic manifestations)
06. Chronic autonomic neuropathies
a. Diabetes
b. Amyloidosis
c. Sensory neuronopathy (Sjögren syndrome)
d. Adie syndrome
e. Small-fiber polyneuropathy (autonomic manifestations)
07. Toxic neuropathies
a. Vacor
b. Hexane
c. Ciguatoxin

d. Vincristine
e. Cisplatin, paclitaxel
f. Heavy metals (arsenic, mercury, thallium)
C. Autonomic dysfunction in CNS disorders
01. Lewy body disorders
02. Multiple system atrophy
03. Tauopathies
04. Pure autonomic failure
05. Multiple sclerosis
06. Stroke
D. Disorders of sweating and thermoregulation
01. Hypothermia
02. Hyperthermia
03. Regional hyperhidrosis
04. Hypohidrosis (central and peripheral causes)
E. Autonomic disorders of the urogenital system
01. Multiple sclerosis
02. Multiple system atrophy
F. Autonomic disorders of the gastrointestinal tract
01. Achalasia
02. Gastroparesis
03. Cyclic vomiting syndrome
04. Intestinal pseudo-obstruction
05. Hirschprung disease
G. 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
03. Disorders of central visceral sensation: insular cortex stroke
17. Normal structure, process, and development through the life cycle
A. Infancy through adolescence, including developmental processes, tasks, crises, and transitions (e.g., school entry, peer relations, individuation)
B. Adulthood, including developmental processes, tasks, crises, and transitions (e.g., employment, parenting) and acquisition/loss of specific capacities (e.g., menopause)

C. Late life, including developmental processes, tasks, crises, and transitions, and acquisition/loss of specific capacities (e.g., cognition, physical endurance)

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. 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. 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
q. 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. Pathophysiology of epilepsy
m. Cerebral blood flow

n. Autonomic function
o. Blood-brain barrier
p. Neurophysiology of the visual system
q. Neurophysiology of hearing and vestibular function
r. Physiology of pain
s. Physiology of peripheral nerve and muscle
t. Other
05. Neuroimmunology/neuroinfectious disease
a. Molecular pathogenesis of multiple sclerosis
b. Molecular neurology of prion and infectious diseases
c. Immunotherapy in multiple sclerosis, myasthenia gravis, and other neurologic disorders
d. Other
06. Neurogenetics/molecular neurology, and neuroepidemiology
a. Mendelian-inherited diseases
b. Other modes of inheritance
c. Mitochondrial disorders
d. Trinucleotide 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
B. Clinical aspects of neurologic disease
01. Epidemiology
02. Risk factors
03. Signs and symptoms

04. Comorbidities
05. Course of illness
06. Prognosis
C. Diagnostic procedures
01. Neuroimaging
a. Structural imaging (computed tomography, magnetic resonance imaging)
b. Vascular imaging (conventional angiography, computed tomographic angiography, magnetic resonance angiography, ultrasound)
c. Functional neuroimaging, including fMRI, SPECT, PET
02. EEG (routine EEG, LTME, subdural and cortical EEGs)
03. Magnetoencephalography
04. Evoked potentials, including intraoperative monitoring
05. Sleep studies, including PSG and MSLT
06. EMG/NCS, including SFEMG
07. Autonomic function testing
08. CSF examination
09. Laboratory studies
10. Neuropsychological and cognitive testing
11. Other
D. Treatment
01. General principles of neuropharmacology
a. Neuropharmacokinetics/neuropharmacodynamics
b. Drug toxicity
c. Drug interactions
d. Teratogenicity
e. Age, gender and ethnicity issues
f. Pharmacogenomics
02. Pharmacotherapy
a. Drugs for migraine and other headache syndromes
b. Analgesics (nonnarcotic, narcotic, etc.)
c. Anti-seizure medications
d. Drugs for sleep disorders
e. Drugs for cerebrovascular disease, including antiplatelet agents, anticoagulants, and thrombolytics

f. Drugs for neuromuscular junction disorders (cholinesterase inhibitors, DAP, etc)
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
k. Immunomodulatory agents, including oral medications, IV Ig, and plasma exchange
l. Antimicrobial agents
m. Drugs used for increased intracranial pressure
n. Other
03. Endovascular treatment
04. Neuromodulation
a. VNS
b. DBS
c. TENS
d. Spinal cord stimulation
e. TMS
f. ECT
05. Critical care
06. Surgical treatment
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
09. Psychotherapy, biofeedback etc.
10. Other
E. Interpersonal and communications skills

01. Communication with patients
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
F. Professionalism
01. Professional behavior
02. Adherence to ethical principles (e.g., informed consent, research issues, clinical care)
03. Participation in the professional community
04. Sensitivity to diverse patient populations
05. End-of-life issues and brain death
06. Fatigue management
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 the 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
03. Community-based care
a. Community-based programs
b. Prevention
c. Recovery and rehabilitation
d. Knowledge of the legal aspects of neurological practice