Supplemental Guide:
Child Neurology

ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Child Neurology Milestones. This is not designed to indicate any specific requirements for each level, but to provide insight into the thinking of the Milestone Work Group.

Included in this document is the intent of each Milestone and examples of what a Clinical Competency Committee (CCC) might expect to be observed/assessed at each level. Also included are suggested assessment models and tools for each subcompetency, references, and other useful information.

Review this guide with the CCC and faculty members. As the program develops a shared mental model of the Milestones, consider creating an individualized guide (Supplemental Guide Template available) with institution/program-specific examples, assessment tools used by the program, and curricular components.

Patient Care 1: Neurologic and Developmental History **Overall Intent:** To efficiently obtain, communicate, and document a history that addresses the neurologic question	
Milestones	**Examples**
Level 1 *Obtains, communicates, and documents a developmentally appropriate history, including perinatal, developmental, and family components*	In this set of examples, the child is ultimately suspected to have a diagnosis of Becker muscular dystrophy ● At this level, obtains the basic history: o Obtains the history that this is a seven-year-old child with a chief complaint of toe walking and asks about siblings with such symptoms, but fails to ask about extended family o Elicits that the child was born at 34 weeks and asks typical questions about developmental stages o Fails to ask if the child has weakness or progression of toe walking over time ● The clinic note requires extensive editing by the faculty for organization and clarification
Level 2 *Obtains, communicates, and documents a complete and relevant history*	● Starts to consider specific causes, such as genetic or inherited conditions, and obtains an extended pedigree that reveals that the maternal uncle and great uncle had trouble walking ● Better describes the toe walking to include when it began and how it has changed over time ● The clinic note is generally organized, but the attending still needs to add some clarification
Level 3 *Obtains, communicates, and documents a well-organized history*	● Obtains the history and faculty member is able to follow the history during the presentation; resident does not skip around the history ● The clinic note does not need to be edited by the attending, as it is complete, organized, and clear
Level 4 *Obtains, communicates, and documents history efficiently*	● Has a clear understanding of common etiologies and presentations and demonstrates this without including extraneous information; queries for any central nervous system causes, such as complications of prematurity. Finding none, targets a line of questioning related to neuromuscular conditions, such as proximal or distal weakness. ● Uses an illness script and faculty members can easily determine that the history is that of a child with muscular dystrophy
Level 5 *Reconciles information from conflicting sources or that are difficult to access into the history*	● When faced with an incomplete history, works to obtain important details by calling a parent not present for the appointment or contacting a school nurse who raised concerns about the patient ● Identifies historical records of significance, including elevations of the liver enzymes, aspartate aminotransferase (AST) and alanine aminotransferase (ALT), in routine labs that the pediatrician performed, and correctly identifies these to be suggestive of a

	muscular dystrophy, rather than a primary liver problem; reconciles outside records from previous investigations
Assessment Models or Tools	● American Board of Psychiatry and Neurology (ABPN) Clinical skills exam (NEX) ● Direct observation ● Objective structured clinical exams (OSCE)s ● Medical record (chart) audit
Curriculum Mapping	●
Notes or Resources	● Pina-Garza JE, Fenichel GM. *Clinical Pediatric Neurology: A Signs and Symptoms Approach*. 7th ed. Philadelphia, PA: Elsevier; 2019. ● Kotagal S, Nordli Jr. DR, Armsby C. UpToDate. Detailed neurologic assessment of infants and children. https://www.uptodate.com/contents/detailed-neurologic-assessment-of-infants-and-children Accessed 2019. ● Swaiman KF, Ashwal S, Ferriero DM, Schor N. *Swaiman's Pediatric Neurology*. 6th ed. Philadelphia, PA: Elsevier; 2017.

Patient Care 2: Neurologic Exam **Overall Intent:** To efficiently obtain, communicate, and document a developmentally appropriate physical examination that addresses the neurologic question	
Milestones	**Examples**
Level 1 *Performs, communicates, and documents a systematic, developmentally appropriate neurological exam on patients ranging across the lifespan*	● For a patient with a right hemisphere stroke, elicits weakness of the left face, arm, and leg but makes some errors in strength scores as well as inaccuracies using the National Institute of Health's stroke scale measure ● For an infant with global developmental delays, measures the head size, assesses visual attention and interactions, and checks muscle tone and reflexes, making some errors in assessment of strength ● In a child with a posterior fossa tumor, performs maneuvers to assess for ataxia and cranial nerve dysfunction, but is unable to visualize the optic disks
Level 2 *Performs, communicates, and documents an accurate neurological exam on patients ranging across the lifespan*	● Performs a systematic neurologic history including mental status, cranial nerves including fundoscopic, motor, sensory, coordination, and gait examinations, which are reproducible by faculty members
Level 3 *Performs, communicates, and documents a comprehensive and relevant neurological exam, incorporating some additional appropriate maneuvers*	● For a boy with proximal muscle weakness, performs an accurate motor examination and includes an assessment of a Gower maneuver ● For a child with suspected absence epilepsy, performs hyperventilation to induce a brief clinical event
Level 4 *Efficiently performs, communicates, and documents a precise neurological exam pertinent to the patient's presenting problem*	● For a girl with acute spinal cord symptoms, quickly performs and communicates an accurate focused examination of critical areas to include power examination, sensory level, and reflexes
Level 5 *Consistently demonstrates mastery in performing, communicating, and documenting a neurological exam on patients ranging across the lifespan*	● After seeing an infant with congenital heart disease in the cardiovascular intensive care unit with altered mental status, identifies subtle unilateral weakness on examination
Assessment Models or Tools	● ABPN Clinical skills exam (NEX) ● Direct observation ● Medical record (chart) audit ● OSCEs ● Simulation
Curriculum Mapping	●
Notes or Resources	● DeMyer WE. *Technique of the Neurological Examination*. 5th ed. New York; NY: McGraw Hill; 2004. ● Volpe JJ. *Neurology of the Newborn*. 5th ed. Philadelphia, PA: Elsevier; 2008. Chapters 3, 4 & 9.

	● O'Brien M on behalf of the Guarantors of Brain*. Aids to the Examination of the Peripheral Nervous System*. 5th ed. Philadelphia, PA: Elsevier; 2010. ● Larsen PD, Stensaas SS. PediNeurologic Exam: a neurodevelopmental approach. https://neurologicexam.med.utah.edu/pediatric/html/home_exam.html Accessed 2019.

Patient Care 3: Critical Care **Overall Intent:** To diagnose and manage critical illnesses and emergencies that affect the nervous system	
Milestones	**Examples**
Level 1 *Recognizes critical illnesses and emergencies that affect the nervous system*	● Recognizes that sudden onset weakness of the right arm may be a stroke ● Recognizes the need for immediate treatment of status epilepticus
Level 2 *Diagnoses critical illnesses and emergencies that affect the nervous system*	● Diagnoses a patient with acute onset weakness and a sensory level as having a neurological emergency with an acute spinal cord syndrome ● Diagnoses an embolic stroke in a patient with congenital heart disease and acute right hemiplegia showing hypodensity of the left middle cerebral artery territory ● Demonstrates appropriate use of continuous electroencephalogram (EEG) monitoring to diagnose patients with non-convulsive status epilepticus
Level 3 *Manages critical illnesses and emergencies that affect the nervous system, with direct supervision*	● Uses an appropriate protocol of drugs and EEG monitoring for the treatment of a patient diagnosed with refractory status epilepticus under the direct supervision of his or her faculty
Level 4 *Independently diagnoses and manages critical illnesses and emergencies that affect the nervous system*	● Independently identifies signs and symptoms of increased intracranial pressure, orders emergent head computed tomography (CT), and initiates treatment ● Independently diagnoses a patient with myasthenic crisis showing bulbar weakness, orders a negative inspiratory force measure and advises intubation for a value under 30, and advises emergent initiation of plasmapheresis or intravenous immunoglobulin (IVIg) in the intensive care unit (ICU)
Level 5 *Serves as a model for the management of critical illnesses and emergencies that affect the nervous system and is an integral part of the interdisciplinary team*	● ICU faculty members seek out this resident for insight into clinical situation and management
Assessment Models or Tools	● ABPN Clinical skills exam (NEX) ● Direct observation ● Medical record (chart) audit ● OSCEs ● Simulation
Curriculum Mapping	●
Notes or Resources	● Suarez JI. Neurocritical care. *Continuum*. 2018;24(6). https://journals.lww.com/continuum/pages/toc.aspx?year=2018&issue=12000&currenttab=IssueOverview Accessed 2019. ● Swaiman KF, Ashwal S, Ferriero DM, Schor N. Brain injury and disorders of consciousness. *Swaiman's Pediatric Neurology*. Chapters 73-79. 5th ed. Philadelphia, PA: Elsevier; 2017.

Patient Care 4: Diagnosis and Management of the Inpatient Setting **Overall Intent:** To gain competence in diagnosing and managing patients with neurological symptoms and disorders in the inpatient setting	
Milestones	**Examples**
Level 1 *Identifies typical presentations of common neurologic conditions* *Develops an initial management plan for common neurologic disorders*	● Identifies an eight-year-old boy with right sided shaking as a possible seizure ● Orders EEG for patient with possible focal seizure
Level 2 *Diagnoses common neurologic conditions* *Manages common neurologic disorders, considering risks and benefits of treatment*	● Evaluates a patient presenting with ascending weakness and absent ankle and patellar reflexes and suspects Guillain-Barre syndrome ● Recommends the patient undergo a lumbar puncture to evaluate cerebrospinal fluid (CSF) protein and cell count ● Anticipates respiratory complications and orders negative inspiratory force
Level 3 *Identifies atypical presentations of common neurologic conditions and typical presentations of uncommon neurologic conditions* *Individualizes management, ensuring the appropriate level of care throughout hospitalization and upon discharge*	● Evaluates an 11-year-old patient presenting with ophthalmoplegia and unsteady gait and finds absent reflexes; appropriately suspects Miller-Fisher variant of Guillain-Barre syndrome ● Cares for a nine-year-old boy with autism and significant behavioral challenges who is admitted for a new onset of epilepsy; and given the patient's risk for future seizures, appropriately recommends a daily anti-convulsant avoiding levetiracetam due to concern for worsening behavior
Level 4 *Diagnoses uncommon neurologic conditions* *Manages treatment response, disease progression, and complications of therapy*	● Evaluates a three-year-old patient with developmental regression, worsening vision, myoclonic, and atonic seizures admitted for myoclonic status epilepticus; orders confirmatory testing to confirm the diagnosis after an EEG shows a time-locked photoparoxysmal response at low frequency flash stimulation on EEG and suspects neuronal ceroid lipofuscinosis. ● Diagnoses a patient with electrographic status epilepticus of sleep with clinical developmental and language regression after obtaining an overnight EEG and starts the child on therapy with high dose bedtime diazepam; makes an appropriate recommendation on when to order another EEG to confirm response and knows how to change management if electrographic status epilepticus of sleep is still present on EEG
Level 5 *Identifies atypical presentations of uncommon neurologic conditions*	● Evaluates a two-year-old child with abnormal movements and generalized tonic-clonic seizures, correctly characterizing the episodes as paroxysmal exercise-induced

Serves as a model for inpatient management of neurological conditions and leads the interdisciplinary team	dyskinesia; appropriately suspects an atypical presentation of glucose transporter type 1 deficiency syndrome ● Leads the inpatient interdisciplinary team in making complex management decisions, appropriately using ancillary services, and appropriately ordering neurodiagnostic testing and treatments for a variety of neurological conditions in the hospital
Assessment Models or Tools	● ABPN Clinical skills exam (NEX) ● Direct observation ● OSCEs ● Mock oral examination of clinical reasoning
Curriculum Mapping	●
Notes or Resources	● American Academy of Neurology. Clinical guidelines. https://www.aan.com/policy-and-guidelines/guidelines/ Accessed 2019. ● Institutional protocols

Patient Care 5: Diagnosis and Management in the Outpatient Setting **Overall Intent:** To diagnose and manage patients with neurological symptoms and disorders in the outpatient setting	
Milestones	**Examples**
Level 1 *Identifies typical presentations of common neurologic conditions* *Develops an initial management plan for common neurologic disorders*	● Lists the typical features of migraine headaches ● Lists reasons why a spell may or may not be a seizure ● Recommends good headache hygiene and appropriate doses of over-the-counter pain medications for a patient with migraines ● Suggests an appropriate plan for a child seen after first unprovoked seizure(s)
Level 2 *Diagnoses common neurologic conditions* *Manages common neurologic disorders, considering risks and benefits of treatment*	● Diagnoses migraine headaches in a patient with the typical features after obtaining the important historical components ● Diagnoses childhood absence syndrome instead of generic “epilepsy” ● Recommends triptans for a migraine headache that does not respond to over-the-counter medication, and counsels family ● Recommends an appropriate second anti-seizure medication if a patient has side effects after the first
Level 3 *Diagnoses atypical variants of common neurologic conditions* *Individualizes management and adapts plan based upon patient response and family factors*	● Lists uncommon features of migraine such as hemiplegic or complicated migraines as well as the typical features of less common headache types such as primary stabbing headaches ● Diagnoses infantile spasms outside of a classic presentation ● Avoids prescribing triptans for patients with hemiplegic or complicated migraines ● Uses specific features of genetic testing or EEG features in children with epilepsy to guide consideration of preventive seizure medication; avoids prescribing valproate when families would like to avoid blood testing
Level 4 *Diagnoses uncommon neurologic conditions* *Manages disease progression and complications of therapy; identifies when to change acuity of care*	● Correctly diagnoses primary stabbing headaches in a patient with localized, stabbing head pains lasting a few seconds without autonomic symptoms ● Appropriately diagnoses Doose syndrome ● Correctly refers a patient to the emergency room when a patient with history of migraines presents to clinic with acute, worsening encephalopathy and focal neurologic deficits ● Correctly obtains urgent prolonged EEG in an infant with tuberous sclerosis with new events concerning for infantile spasms
Level 5 *Identifies atypical presentations of uncommon neurologic conditions*	● Identifies a patient with exercise intolerance but no weakness may have a neuromuscular disorder

Longitudinally and independently manages patients with complex neurologic conditions	● Longitudinally follows a patient with epilepsy including determining how often a patient with complex epilepsy needs to be seen in clinic, knows when to change medications and when to make a diagnosis of intractable epilepsy, and orders an appropriate pre-surgical evaluation for intractable epilepsy
Assessment Models or Tools	● ABPN Clinical skills exam (NEX) ● Direct observation ● OSCEs ● Mock oral examination
Curriculum Mapping	●
Notes or Resources	● American Academy of Neurology. Clinical guidelines. https://www.aan.com/policy-and-guidelines/guidelines/ Accessed 2019. ● American Headache Society. Guidelines and position stations. https://americanheadachesociety.org/resources/guidelines/. Accessed 2019. ● Institutional protocols and pathways

Patient Care 6: Neuroimaging **Overall Intent:** To use and interpret developmental and acquired abnormalities on neuroimaging	
Milestones	**Examples**
	A patient with a subtle malformation of the perisylvian gyri (Perisylvian polymicrogyria) (Vignette/Scenario for Levels 1-5)
Level 1 *Identifies normal neuroanatomy on brain and spine magnetic resonance (MR) and computed tomography (CT)*	● Identifies brain anatomy as it appears in all planes
Level 2 *Describes major abnormalities of the brain and spine on MR and CT*	● Identifies abnormalities such as agenesis of corpus callosum, schizencephaly, and holoprosencephaly ● Describes size, location, and characteristics of a large posterior fossa lesion
Level 3 *Describes subtle abnormalities of the brain and spine and normal developmental changes on MR and CT*	● Suggests that an enlarged sylvian fissure is abnormal and identifies the cortical ribbon as normal or not ● Compares the normal and abnormal signal intensities in the areas in question ● Identifies changes in myelination patterns over the first two years of life
Level 4 *Interprets developmental and acquired abnormalities on neuroimaging of brain and spine*	● Correctly diagnoses perisylvian polymicrogyria based on imaging findings
Level 5 *Interprets rare and complex findings on neuroimaging and serves as a resource for colleagues*	● Consistently diagnoses a variety of leukodystrophies based on imaging alone
Assessment Models or Tools	● Assessment during case conferences ● Direct observation ● Mock oral examination ● OSCEs
Curriculum Mapping	●
Notes or Resources	● The neuroradiologist is often able to question the residents about findings in the setting of regular neuroradiology conferences ● Radiopedia. https://radiopaedia.org/?lang=us. Accessed 2019. ● Pediatric Neurology. https://www.pedneur.com/. Accessed 2019. ● Neurology. https://n.neurology.org/. Accessed 2019.

Patient Care 7: Electroencephalogram (EEG) **Overall Intent:** To interpret and create reports for common EEG abnormalities	
Milestones	**Examples**
Level 1 *Describes general indications for an EEG*	● Discusses that a suspected seizure and altered mental status are indications for an EEG
Level 2 *Describes normal EEG features using correct terminology, including common artifacts, across the lifespan*	● Describes the posterior dominant rhythm and sleep/wake states ● Describes eye blink artifact ● Uses terminology including montage, amplitude, frequency, spikes, etc.
Level 3 *Describes patterns of status epilepticus, normal EEG variants and common abnormalities, across the lifespan*	● Discusses that continuous right central spikes may be focal status epilepticus ● Describes spikes over the right temporal area ● Describes positive occipital sharp transients of sleep (POSTS)
Level 4 *Interprets common EEG abnormalities and creates a report*	● Correctly identifies Rolandic spikes may be associated with self-limited epilepsy with centrotemporal spikes ● Produces a systematic description of the EEG record with reasonable interpretation of the significance of common findings
Level 5 *Interprets uncommon EEG abnormalities*	● Correctly identifies eye closure sensitivity
Assessment Models or Tools	● Assessment during case conferences ● Direct observation ● Mock oral examination
Curriculum Mapping	●
Notes or Resources	● There are several venues in which the reliability of the resident interpretation of EEG can be assessed. These would include escalation protocol rotations, neonatal intensive care unit rotations, epilepsy monitoring unit rotations and, although not usually applicable to outpatient records, the ability to interpret the EEG report in the clinical setting is frequently done in that setting ● Libenson MK. *Practical Approach to Electroencephalography*. Philadelphia, PA: Elsevier Health Sciences; 2010 ● Fisch B. *Fisch and Spehlmann's EEG Primer: Basic Principles of Digital and Analog* EEG 3rd ed. Philadelphia, PA: Elsevier; 1999. ● Schomer DL, Lopes da Silva F. *Niedermeyer's Electroencephalography: Basic Principles, Clinical Applications, and Related Fields*. 6th ed. Philadelphia. PA: Lippincott, Williams, & Wolters; 2011. ● Britton JW, Frey LC, Hopp JLet al., authors; St. Louis EK, Frey LC, editors. Electroencephalography (EEG): an introductory text and atlas of normal and abnormal findings in adults, children, and infants [Internet]. Chicago: *American Epilepsy Society*;

	2016. The Developmental EEG: Premature, Neonatal, Infant, and Children. Available from: https://www.ncbi.nlm.nih.gov/books/NBK390356/ Accessed 2019.

Patient Care 8: Lumbar Puncture **Overall Intent:** To independently perform lumbar puncture in the appropriate settings	
Milestones	**Examples**
Level 1 *Lists the indications, contraindications, and complications of lumbar puncture*	● Indications for a lumbar puncture include for a patient with fever and altered mental status ● Contraindications include bleeding risk, suspicion of space-occupying lesion causing mass effect, etc. ● Identifies complications of lumbar puncture include headache, infection and epidural hematoma
Level 2 *Performs lumbar puncture and manages complications from lumbar puncture under direct supervision*	● Performs lumbar puncture using appropriate technique with faculty member at bedside ● Manages post-lumbar puncture headache and back pain appropriately ● Consults anesthesia for blood patch when appropriate
Level 3 *Performs lumbar puncture with indirect supervision*	● Performs lumbar puncture using appropriate technique with faculty available as needed
Level 4 *Independently performs lumbar puncture on patients across the lifespan*	● Performs lumbar puncture using appropriate technique on patients of all ages, including neonates, without direct supervision of faculty members
Level 5 *Administers intrathecal therapies*	● Administers intrathecal medication such as nusinersen
Assessment Models or Tools	● Direct observation ● Review of laboratory results ● Simulation
Curriculum Mapping	●
Notes or Resources	● Ellengy MS, Tegtmeyer K, Lai S, Braner DAV. Lumbar puncture. *N Engl J Med* 2006; 355:e12 https://www.nejm.org/doi/full/10.1056/NEJMvcm054952 Accessed 2019. ● Volpe JJ. *Neurology of the Newborn*. 5th ed. Philadelphia, PA: Saunders Elsevier; 2008. Chapters 4 pp 154-155.

Patient Care 9: Electromyography **Overall Intent:** To interpret results of nerve conduction study/electromyogram testing	
Milestones	**Examples**
Level 1 *Describes general indications for nerve conduction studies/electromyography tests*	● Discusses the utility of nerve conduction study/electromyogram in diagnosis of disorders of the peripheral nervous system ● Recognizes that an electromyogram can find abnormalities such as compression of the median nerve at the wrist
Level 2 *Describes patterns seen on nerve conduction studies/electromyography related to localization*	● Describes the pattern of prolongation of median nerve distal latency across the wrist as a pattern associated with carpal tunnel syndrome
Level 3 *Plans nerve conductive studies/electromyography in the context of the clinical presentation*	● Recognizes the importance of checking the median motor and sensory responses to evaluate for carpal tunnel in a patient with numb first-third fingers who wakes up in the middle of the night to shake them out
Level 4 *Interprets results of nerve conductive studies/electromyography testing in the context of the clinical presentation*	● Interprets pattern of nerve conduction study/electromyogram findings to indicate median nerve neuropathy
Level 5 *Plans, performs, interprets, and creates a report for nerve conductive studies/electromyography*	● Performs an electromyogram with appropriate studies on both an infant with brachial plexus injury and a 16-year-old with cervical radiculopathy
Assessment Models or Tools	● Assessment of case conferences ● Clinical discussions on inpatient and outpatient rotation experiences ● Direct observation ● Simulation
Curriculum Mapping	●
Notes or Resources	● Preston DC, Shapiro BE. *Electromyography and Neuromuscular Disorders: Clinical-Electrophysiologic Correlations.* 3rd ed. Philadepia, PA: Elsevier; 2013. Chapter 16: Clinical-electrophysiologic correlations: overview and common patterns ● Kumbhare D, Robinson L, Buschbacher R. *Buschbacher's Manual of Nerve Conduction Studies.* 3rd ed. New York, NY: Demos Medical Publishing LLC; 2015. ● Darras BT, Royden Jones T, Ryan M et al. *Neuromuscular Disorders of Infancy, Childhood and Adolescence.* 2nd ed. Philadelphia, PA: Elsevier; 2015. ● Holmes, GL, Moshe SL and Royden Jones, H. *Clinical Neurophysiology of Infancy, Childhood and Adolescence*. Philadelphia, PA: Elsevier; 2006.

Patient Care 10: Determination of Death by Neurologic Criteria **Overall Intent:** To make an appropriate determination of death using neurologic criteria	
Milestones	**Examples**
Level 1 *Discusses the concept of determination of death by neurologic criteria*	● Explains why death may be declared while heart and lungs work or are being supported; may discuss criteria in general, but not identify all criteria
Level 2 *Identifies components of determination of death by neurologic criteria*	● Cites the different criteria for determination of death by neurologic criteria at different ages
Level 3 *Performs determination of death by neurologic criteria, with assistance*	● Performs the exam with assistance, with the observer helping with technique or helping identify other components of the exam not addressed by the resident
Level 4 *Independently performs determination of death by neurologic criteria*	● In simulation, performs the exam, including a complete and accurate assessment with faculty member present but not participating
Level 5 *Serves as a role model for determination of death by neurologic criteria*	● Role models the approach to determination of death by neurologic criteria, including identifying the patient appropriately, discussing with the patient's family, discussing with other medical teams and staff members, completing a full exam accurately, interpreting the exam appropriately, and discussing the results and interpretation with the family both professionally and compassionately
Assessment Models or Tools	● Direct observation ● Simulation
Curriculum Mapping	●
Notes or Resources	● Nakagawa TA, Ashwal S, Mathur M, Mysore M, the Society of Critical Care Medicine, Section on Crtiical Care and Section on Neurology of the American Academy of Pediatrics, and the Child Neurology Society. Guidelines for the determination of brain death in infants and children: an update of the 1987 task force recommendations. *Pediatrics* Sep 2011, 128 (3) https://pediatrics.aappublications.org/content/128/3/e720 Accessed 2019. ● World Health Organization. International guidelines for the determination of death – phase I. 2012. https://www.who.int/patientsafety/montreal-forum-report.pdf Accessed 2019.

Medical Knowledge 1: Development and Behavior **Overall Intent:** To demonstrate sufficient knowledge to counsel families regarding common disorders of motor, emotional, cognitive, and behavioral development	
Milestones	**Examples**
Level 1 *Lists growth and developmental norms* *Recognizes that emotional, cognitive, and behavioral developments evolve across the lifespan*	● Cites different expectations for development and behavior at different points in the lifespan, including normal acquisition of milestones ● Discusses that children typically roll by six months and walk by 15 months ● Recognizes that children's behavior might change over time but cannot give concrete examples
Level 2 *Identifies signs of abnormal growth and development* *Discusses normal emotional, cognitive, and behavioral development across the lifespan*	● Knows that a 20-month-old child not speaking is delayed ● Discusses development of stranger anxiety ● Discusses that teenagers placing less value on parent's values than on peers is typical
Level 3 *Demonstrates sufficient knowledge to counsel families regarding outliers in normal growth and development* *Discusses abnormal emotional, cognitive, and behavioral development across the lifespan*	● Characterizes findings into context (e.g., isolated speech/language delay versus global developmental delay) and has appropriate knowledge to counsel families about abnormal findings ● Discusses slower attainment of motor milestones in patients with hypotonia ● Discusses how a child having trouble at school may indicate a learning disability
Level 4 *Demonstrates sufficient knowledge to counsel families regarding common and uncommon disorders of development across the lifespan*	● Goes beyond putting abnormal findings into context and discusses specific trajectories of common disorders ● Describes that children with cerebral palsy may have some functional improvement with therapies but may still have an increasing gap between their functioning and that of their classmates as the classmates learn to do more advanced skills (e.g., soccer)
Level 5 *Serves as a role model to counsel families regarding uncommon disorders of development across the lifespan*	● Discusses with junior learners the importance of citing data and expectations for uncommon disorders. For example, they may see a child with Rett syndrome and discuss not just that the child will progress but anticipate specific problems and concerns that may develop/worsen over time
Assessment Models or Tools	● Direct observation ● Simulations ● Mock oral examination
Curriculum Mapping	●
Notes or Resources	● Pediatric Neurology. https://www.pedneur.com/. Accessed 2019. ● Neurology. https://n.neurology.org/. Accessed 2019.

	● Menkes JH. *Textbook of Child Neurology*. 5th ed. Williams and Wilkins; 1995. ● Swaiman KF, Ashwal S, Ferriero DM, Schor N. *Swaiman's Pediatric Neurology*. 6th ed. Philadelphia, PA: Elsevier; 2017.

Medical Knowledge 2: Localization **Overall Intent:** To localize neurologic deficits to specific locations in the nervous system and apply their hypothesis to patient management	
Milestones	**Examples**
Level 1 *Localizes signs and symptoms to general regions of the nervous system*	● Hypothesizes when a patient with a foot drop and areflexia in the ipsilateral ankle, as well as numbness and pain down the lateral aspect of the ipsilateral lower leg, likely has a problem within the peripheral nervous system
Level 2 *Localizes signs and symptoms to specific regions of the nervous system*	● Discusses how the same patient's deficit likely comes from a nerve problem because of the distribution of the deficits and presence of both motor and sensory findings
Level 3 *Localizes signs and symptoms to discrete structures of the nervous system*	● Discusses how the same patient has likely experienced damage to the ipsilateral common peroneal nerve due to the distribution of the deficits
Level 4 *Precisely localizes signs and symptoms and describes the impact on patient management*	● Discusses how the same patient has had these symptoms since recent knee surgery and that the common peroneal nerve is likely being compressed, causing the patient's deficits; suggests a surgical decompression since the symptoms are not resolving with time
Level 5 *Role models the precise localization of complex signs and symptoms to discrete structures of the nervous system*	● Is sought out by other learners for an opinion when attempting to localize the source of neurologic deficits in a challenging case
Assessment Models or Tools	● Direct observation ● In training examination; neuroanatomy section ● Medical record (chart) audit ● Mock oral examination
Curriculum Mapping	●
Notes or Resources	● Blumenfeld H. *Neuroanatomy through Clinical Cases*. 2nd ed. Sunderland, MA: Sinauer Associates; 2010. ● Aids to the examination of the peripheral nervous system

Medical Knowledge 3: Clinical Reasoning and Formulation **Overall Intent:** To reach an accurate differential diagnosis based on age and clinical symptomatology; to modify the differential diagnosis if the clinical symptoms evolve	
Milestones	**Examples**
	● The following examples relate to the following scenario: a 21-month-old developmentally normal girl with an upper respiratory infection and fever to 101 degrees F and a self-limited generalized convulsion lasting 30 seconds
Level 1 *Synthesizes available information to create age-appropriate broad differential diagnosis*	● Gives a differential diagnosis including febrile seizure, first presentation of epilepsy, or a provoked seizure of some kind
Level 2 *Identifies relevant pathophysiologic categories to generate a structured differential diagnosis*	● Expands the differential diagnosis to include febrile seizure, first presentation of a genetic epilepsy, provoked seizure due to structural lesion, vascular process, infectious cause, metabolic disturbance, intoxication, inborn error of metabolism, etc.
Level 3 *Accurately prioritizes differential diagnosis*	● Prioritizes the differential diagnosis to include that there is a strong history of febrile seizures (but no epilepsy) on the mother's side of the family, and the event most likely represents a simple febrile seizure and no further workup or treatment is indicated at this time; understanding that first presentation of epilepsy cannot be ruled out when the patient has a brief self-limited convulsion in the setting of fever and then returns immediately to baseline with a non-focal neurologic examination
Level 4 *Continuously re-evaluates differential diagnosis in response to changes in clinical circumstances*	● The patient has frequent convulsions, now without fever or illness. Sometimes the events start with right-sided face and arm twitching that progresses to bilateral shaking. At this point, the child has focal epilepsy and further workup and treatment are warranted
Level 5 *Role models formulation and clinical reasoning*	● Coaches medical students, junior residents, and/or colleagues on creation of a differential diagnosis ● Educates and provides evidence-based advice to other team members on indications for SCN1A gene testing if the above patient has more febrile seizures and/or other changes in clinical appearance
Assessment Models or Tools	● ABPN Clinical skills exam (NEX) ● Direct observation ● Medical record (chart) audit ● Mock oral examination ● OSCEs
Curriculum Mapping	●
Notes or Resources	● The Society to Improve Diagnosis in Medicine. Competency Summary List. Inter-professional consensus curriculum on diagnosis and diagnostic error. https://www.improvediagnosis.org/competency-summary-list/ Accessed 2019.

	● The Society to Improve Diagnosis in Medicine. Inter-professional consensus curriculum on diagnosis and diagnostic error. Driver Diagram: https://www.improvediagnosis.org/wp-content/uploads/2018/10/Driver_Diagram_-_July_31_-_M.pdf Accessed 2019. ● The Society to Improve Diagnosis in Medicine. Assessment of reasoning tool. Errors in clinical reasoning are central factors in many diagnostic errors. https://www.improvediagnosis.org/art/ Accessed 2019. ● SimulConsult. https://simulconsult.com Accessed 2019.

Medical Knowledge 4: Diagnostic Investigation **Overall Intent:** To implement a targeted, cost effective plan for high-yield diagnostic testing in patients with neurologic complaints	
Milestones	**Examples**
Level 1 *Discusses general diagnostic approach appropriate to clinical presentation*	● Determines that a patient with hemiplegia and aphasia should have imaging of the brain
Level 2 *Lists indications, contraindications, risks, and benefits of diagnostic testing*	● Describes when a lumbar puncture may be indicated in a patient with fever and altered mental status ● Knows that a magnetic resonance imaging (MRI) brain is contraindicated in patients with cochlear implants ● Discusses how iodinated contrast material may cause nephropathy in patients with impaired kidney function ● Identifies that a benefit of a cerebral angiogram is identification of aneurysms or other vascular malformations that may require treatment to prevent catastrophic rupture
Level 3 *Prioritizes and interprets diagnostic tests appropriate to clinical urgency and complexity*	● Discusses how a patient with papilledema and decreased vision who is suspected to have intracranial hypertension needs urgent imaging of the brain to rule out a space-occupying lesion and venous sinus thrombosis before a lumbar puncture is performed; ● After negative imaging, the lumbar puncture (LP) is performed, opening pressure is 35 and cerebrospinal fluid (CSF) analysis is unremarkable. The resident understands that the high opening pressure and normal CSF support the diagnosis of idiopathic intracranial hypertension (IIH)
Level 4 *Uses complex diagnostic approaches that have the highest diagnostic yield and cost effectiveness*	● Orders Duchenne muscular dystrophy deletion/duplication testing instead of ordering whole exome sequencing for a child with Gower's sign and a creatine kinase level of 30,000 ● Counsels a migraine patient on why an MRI of the brain is not indicated in their condition ● Orders a head ultrasound in a neonate with suspected hydrocephalus instead of an MRI of the brain
Level 5 *Demonstrates sophisticated knowledge of diagnostic testing and controversies*	● Directs diagnostic testing of other team members in complex cases ● Interprets advanced diagnostic testing used for pre-surgical work-up of intractable epilepsy
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit
Curriculum Mapping	●
Notes or Resources	● Preston DC, Shapiro BE. *Electromyography and Neuromuscular Disorders: Clinical-Electrophysiologic Correlations.* 3rd ed. Philadepia, PA: Elsevier; 2013. ● Volpe JJ. *Neurology of the Newborn*. 5th ed. Philadelphia, PA: Elsevier; 2008. Chapter 4.

	● Adam MP, Ardinger HH, Pagon RA, et al. *Gene Reviews*. Seattle, WA: University of Washington; 1993-2019.

Systems-Based Practice 1: Patient Safety and Quality Improvement (QI) **Overall Intent:** Engages in the analysis and management of patient safety events, including relevant communication with patients, families, and health care professionals; is able to conduct a QI project	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of common patient safety events* *Demonstrates knowledge of how to report patient safety events* *Demonstrates knowledge of basic quality improvement methodologies and metrics*	● Recognizes that multiple subtherapeutic doses of benzodiazepines put a patient at risk for continued seizure and also respiratory suppression, knows there is an online system for error reporting in the hospital but has not yet used it, and knows to speak to the emergency room physician about the patient safety event but may require guidance from the attending in how to approach this ● Describes the Plan-Do-Study-Act methodology of QI
Level 2 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems (simulated or actual)* *Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)*	● Identifies that the lack of a protocol for status epilepticus in the emergency room may have contributed to this patient safety event ● Records the event in the hospital's online anonymous event reporting database ● Describes a related QI project in the hospital
Level 3 *Participates in analysis of patient safety events (simulated or actual)* *Participates in disclosure of patient safety events to patients and families (simulated or actual)* *Participates in local quality improvement initiatives*	● Prepares a morbidity and mortality conference on this clinical scenario that the resident and the emergency room resident present to their departments ● Participates in communication with patients/families about the event ● Participates in a QI project, regarding the availability of an institutional status epilepticus protocol for the pediatric emergency department though they may not have yet designed a QI project
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)*	● Collaborates with a team to analyze a patient safety event

Discloses patient safety events to patients and families (simulated or actual) *Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project*	● Competently communicates with patients/families about those events ● Conducts a search of all patients with status epilepticus who have been seen in the emergency room in the past six months; finds that many other patients have also received multiple subtherapeutic doses of benzodiazepines; concludes that a protocol for the management of status epilepticus in the emergency room is needed
Level 5 *Actively engages teams and processes to modify systems to prevent patient safety events* *Role models or mentors others in the disclosure of patient safety events* *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	● Competently assumes a leadership role at the departmental or institutional level for patient safety and/or QI initiatives ● Coaches a junior resident on disclosure of medical errors in an actual or simulated setting ● Assumes a lead role involving the quality and safety teams, pediatric emergency medicine, pediatrics, neurology and ICU teams in implementing an institution-wide protocol for management of pediatric status epilepticus
Assessment Models or Tools	● System documentation of safety reporting ● Direct observation ● E-module multiple choice tests ● Portfolio review ● Simulation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Institute of Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. 2019. ● American Medical Association (AMA). AMA Graduate Medical Education (GME) competency modules on quality improvement. https://edhub.ama-assn.org/gcep Accessed 2019. ● AMA. AMA GME competency modules on patient safety. https://edhub.ama-assn.org/gcep Accessed 2019. ● Agency for healthcare research and quality. https://www.ahrq.gov/programs/index.html?search_api_views_fulltext=&field_program_topics=14177 Accessed 2019.

Systems-Based Practice 2: System Navigation for Patient-Centered Care **Overall Intent:** To effectively navigate the health care system, including the interdisciplinary team and other care providers; to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of care coordination*	● Identifies that the patient will be need social work or case management prior to discharge
Identifies key elements for safe and effective transitions of care and hand-offs	● During simulation, identifies allergies and pending lab data as key elements for successful day-night hand-offs
Demonstrates knowledge of population and community health needs and disparities	● Identifies access to primary care and insurance status as social determinants of health
Level 2 *Coordinates care of patients in routine clinical situations effectively using the roles of the interprofessional teams*	● Coordinates the follow-up appointment and EEG prior to discharge and works with social worker to ensure patient is able to get to follow-up appointment
Performs safe and effective transitions of care/hand-offs in routine clinical situations	● Completes structured sign-out for a patient with new onset epilepsy
Identifies specific population and community health needs and inequities for their local population	● Identifies that the hospital serves a large, low income rural area without good public transportation and because of this, many patients have difficulty with accessing medications
Level 3 *Coordinates care of patients in complex clinical situations effectively using the roles of their interprofessional teams*	● Works with nutrition, respiratory therapy, and physical therapy to optimize care for a patient with a new diagnosis of spinal muscular atrophy and severe malnutrition
Performs safe and effective transitions of care/hand-offs in complex clinical situations	● Performs safe and effective transitions of care for a patient with myasthenia gravis with acute respiratory decompensation, and is transferred to the intensive care unit
Uses local resources effectively to meet the needs of a patient population and community	● Provides information about resources for a local food bank and dental clinic near the patient's home when managing patients in continuity clinic
Level 4 *Role models effective coordination of patient-centered care among different disciplines and specialties*	● Leads the discussion in an interprofessional discharge planning conference for a patient with complex psychosocial issues
Role models and advocates for safe and effective transitions of care/hand-offs within and	● Calls the primary care doctor for a patient newly diagnosed with infantile spasms to discuss potential complications and dosing of steroid treatment

across health care delivery systems, including outpatient settings *Participates in changing and adapting practice to provide for the needs of specific populations*	● Coaches a junior resident on how to communicate with the adult neurologist and family to transition a patient with intellectual disability and epilepsy to adult neurology ● In the continuity clinic, helps implement a literacy screening tool to identify populations that would benefit from alternative patient education materials
Level 5 *Analyzes the process of care coordination and leads in the design and implementation of improvements* *Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes* *Leads innovations and advocates for populations and communities with health care inequities*	● Works with clinic nurse manager to analyze clinical schedule and make changes to the appointment structure to minimize no-show rates and improve access to care ● Works with a QI mentor to identify better hand-off tools for on-call services or to improve teaching sessions ● Identifies needs of the Burmese refugee population in continuity clinic and designs a home visit program to improve medication adherence
Assessment Models or Tools	● Direct observation ● Medical record (chart) review ● Multisource feedback ● OSCEs ● Quality metrics ● Review of sign-out tools
Curriculum Mapping	●
Notes or Resources	● CDC. Population Health Training in Place Program (PH-TIPP). https://www.cdc.gov/pophealthtraining/whatis.html. 2019. ● Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science*. Philadelphia, PA: Elsevier; 2016. https://commerce.ama-assn.org/store/ui/catalog/productDetail?product_id=prod2780003. 2019.

Systems-Based Practice 3: Physician Role in Health Care Systems **Overall Intent:** To understand one's own role in the treatment team and in the complex health care system and how to optimize the system to improve patient care and the health system's performance	
Milestones	**Examples**
Level 1 *Identifies key components of the complex health care system (e.g., hospital, skilled nursing facility, finance, personnel, technology)*	● Lists hospital, skilled nursing facility, finance, personnel, and technology as components of the health care system
Describes basic health payment systems (e.g., government, private, public, uninsured care) and practice models	● Recognizes there are different payment systems, such as managed care systems, Medicaid, and commercial third-party payers
Identifies basic knowledge domains for effective transition to practice	● Knows that there are different requirements for varying levels of coding
Level 2 *Describes how components of a complex health care system are interrelated, and how this impacts patient care*	● Understands that when a 10-year-old child needs an MRI of the brain and the hospital is not in the preferred network for this patient, the insurance company also will not allow an MRI to be ordered without a peer-to-peer consultation
Delivers care with consideration of each patient's payment model (e.g., insurance type)	● Arranges to have the MRI performed at an in-network facility so can be covered by insurance
Describes core administrative knowledge needed for transition to practice	● Lists medication and allergy reconciliation and updating the problem list as being required every visit
Level 3 *Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)*	● Knows that a late discharge impacts new patient admissions
Engages with patients in shared decision making, informed by each patient's payment models	● Discusses other options with the patient when their insurance does not cover rizatriptan
Demonstrates use of administrative knowledge required for transition to practice	● Bills an encounter at a Level 4 and elements of their notes supports this level of service
Level 4 *Manages various components of the complex health care system to provide efficient, and effective patient care and transition of care*	● Works collaboratively with the institution to improve patient assistance resources or designs the institution's community health needs assessment

Advocates for patient care needs (e.g., community resources, patient assistance resources) with consideration of the limitations of each patient's payment model *Analyzes individual practice patterns and professional requirements for transition to practice*	● Provides documentation for need of lacosamide for a patient with intractable focal epilepsy ● Finds a resource for free gene testing in a child ● Asks social worker to suggest low-cost psychological therapy for patients ● Reviews previous continuity clinic patients with seizures to determine the number with seizure action plans ● Identifies a pattern of prolonged patient visits and level of billing ● Ensure completion of Neurology Clinical Evaluation (NEX) in time to take boards
Level 5 *Advocates for or leads systems change that enhances high-value, efficient, and effective patient care and transition of care* *Participates in health policy advocacy activities* *Educates others to prepare them for transition to practice*	● Develops an institutional protocol regarding the neuroimaging of patients with particular types of headaches and addresses neuroimaging as it relates to delivering high-value care ● Improves informed consent process for non-English-speaking patients requiring interpreter services ● Coaches junior residents on preparation and need for fellowship or applying for attending jobs
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Portfolio review
Curriculum Mapping	●
Notes or Resources	● Agency for Healthcare Research and Quality. The Challenges of Measuring Physician Quality. https://www.ahrq.gov/talkingquality/measures/setting/physician/challenges.html. 2019. ● Agency for Healthcare Research and Quality. Major Physician Measurement Sets. https://www.ahrq.gov/talkingquality/measures/setting/physician/measurement-sets.html. 2019. ● The Kaiser Family Foundation. Health Reform. https://www.kff.org/topic/health-reform/. 2019. ● Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities from a national academy of medicine initiative. *JAMA*. 2017;317(14):1461-1470. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. 2019.

	● The Commonwealth Fund. Health System Data Center. http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1. 2019. ● AAN. Neurology career center. https://careers.aan.com/ Accessed 2019.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice **Overall Intent:** To incorporate evidence into clinical practice	
Milestones	**Examples**
Level 1 *Uses available evidence to care for a routine patient*	● Searches for review article on Duchenne muscular dystrophy
Level 2 *Articulates clinical questions to guide evidence-based care*	● Search for evidence for use of steroids in Duchenne muscular dystrophy
Level 3 *Locates and applies the best available evidence to the care of complex patients*	● Uses clinical practice guideline from American Academy of Neurology (AAN) to treat patients with Duchenne muscular dystrophy
Level 4 *Critically appraises and applies evidence even in the face of uncertainty and conflicting evidence to guide care*	● Reviews and analyzes a primary research article on the treatment of Duchenne muscular dystrophy that contradicts current practice ● Reviews multiple articles on treatment of infantile spasms to determine appropriate treatment
Level 5 *Coaches others to critically appraise and apply evidence for complex patients; and/or participates in the development of guidelines*	● Coaches or is sought out by others in analyzing research ● Reviews literature in order to update departmental protocols
Assessment Models or Tools	● Direct observation ● Journal club ● Oral or written examination ● Portfolio review ● Presentation
Curriculum Mapping	●
Notes or Resources	● National Institutes of Health. Write Your Application. https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm. 2019. ● U.S. National Library of Medicine. PubMed Tutorial. https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html. 2019. ● Institutional IRB guidelines ● Various journal submission guidelines

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth **Overall Intent:** To seek clinical performance information with the intent to improve care; to reflect on all domains of practice, personal interactions, and behaviors, and their impact on colleagues and patients (reflective mindfulness); to develop clear objectives and goals for improvement in some form of a learning plan	
Milestones	**Examples**
Level 1 *Accepts responsibility for personal and professional development by establishing goals* *Identifies the factors which contribute to gap(s) between expectations and actual performance* *Actively seeks opportunities to improv*	● Creates a personal learning goal for the next year ● Identifies that too much time is spent on notes ● Asks attending for tips on efficient note writing
Level 2 *Demonstrates openness to performance data (feedback and other input)* *Analyzes and reflects on the factors which contribute to gap(s) between expectations and actual performance* *Designs and implements a learning plan, with prompting*	● Asks follow-up questions regarding how to improve after receiving feedback ● Identifies that too much time spent on notes impacts other aspects of patient care ● At the suggestion of the attending, creates a note template
Level 3 *Seeks performance data episodically, with adaptability and humility* *Analyzes, reflects on, and institutes behavioral change(s) to narrow the gap(s) between expectations and actual performance* *Independently creates and implements a learning plan*	● At the end of a particularly difficult rotation, asks for feedback but not at the end of a rotation that is easy; does not seek feedback ● Tracks the time spent on notes to recognize improved efficiency ● Independently creates a note template to improve efficiency of documentation
Level 4 *Intentionally seeks performance data consistently with adaptability and humility* *Addresses assumptions and considers alternatives in narrowing the gap(s) between expectations and actual performance*	● At the end of all rotations, seeks out and uses feedback on performance ● Works with information technology (IT) to improve note template after recognizing that documentation is still inefficient

Analyze and edit/modify learning plans regularly	● Gets quality monitoring reports from IT to review the learning plan
Level 5 *Role models consistently seeking performance data with adaptability and humility* *Coaches others on reflective practice* *Role models creation, implementation, analysis, and modification of learning plans*	● Asks junior learners for feedback and asks for feedback from faculty in front of junior learners ● Encourages other learners on the team to consider how their behavior affects the rest of the team ● Implements “Feedback Fridays” with modification of learning plans following each session
Assessment Models or Tools	● Direct observation ● Multisource feedback ● Portfolio review ● Review of learning plan ● Semiannual review
Curriculum Mapping	●
Notes or Resources	● Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Academic Medicine*. 2009;84(8):1066-1074. https://journals.lww.com/academicmedicine/fulltext/2009/08000/Measurement_and_Correates_of_Physicians__Lifelong.21.aspx. 2019. ● Lockspeiser TM, Schmitter PA, Lane JL, Hanson JL, Rosenberg AA, Park YS. Assessing residents’ written learning goals and goal writing skill: validity evidence for the learning goal scoring rubric. *Academic Medicine*. 2013;88(10):1558-1563. https://journals.lww.com/academicmedicine/fulltext/2013/10000/Assessing_Residents__Written_Learning_Goals_and.39.aspx. 2019. ● Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. *Academic Pediatrics*. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/pdf. 2019.

Professionalism 1: Professional Behavior and Ethical Principles **Overall Intent:** To recognize and address lapses in ethical and professional behavior, demonstrates ethical and professional behaviors, and use appropriate resources for managing ethical and professional dilemmas	
Milestones	**Examples**
Level 1 *Identifies and describes potential triggers for professionalism lapses and describes when and how to appropriately report professionalism lapses, including strategies for addressing common barriers* *Demonstrates knowledge of fundamental ethical principles*	● Identifies local mechanisms that are appropriate to monitoring professionalism such as ethics committee, peer review committee, or ombuds ● Identifies that stressors such as sleep deprivation and home stress can be potential triggers for professionalism lapses ● Discusses the basic principles underlying ethics (autonomy, beneficence, non-maleficence, justice) and professionalism (professional values and commitments)
Level 2 *Demonstrates professional behavior in routine situations and takes responsibility for own professionalism lapses* *Analyzes straightforward situations using ethical principles and recognizes need to seek help in managing and resolving complex ethical situations*	● Is usually prepared and on time and when very late, apologizes to the team ● Refuses to prescribe a stimulant to a student who does not have attention deficit hyperactivity disorder (ADHD) but wants to do better in math ● Contacts the ethics committee when a patient in the ICU is on a ventilator and the parents disagree about the next steps
Level 3 *Demonstrates professional behavior in complex or stressful situations* *Analyzes complex situations using ethical principles*	● Remains an active listener to concerns when divorced parents of a patient disagree on next steps in care ● During a stroke code, receives multiple pages and must prioritize responses ● Explains to a 13-year-old Jehovah's Witness why he or she may receive a blood transfusion during surgery by referring to autonomy and beneficence
Level 4 *Recognizes situations that may trigger professionalism lapses and/or intervenes to prevent lapses in self and others* *Recognizes and uses appropriate resources for managing and resolving ethical dilemmas as needed*	● During a stroke code, receives multiple pages and recognizes that they must take a moment for mindfulness to prevent a professionalism lapse before returning pages ● Calls ethics committee when a 13-year-old child needs a transfusion, but the parents disagree with the ethical analysis
Level 5 *Coaches others when their behavior fails to meet professional expectations*	● Coaches a colleague who is disrespectful to a consulting service how to help their behavior meet professional expectations

Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution	● Seeks to develop an institutional protocol for managing blood transfusions for pediatric Jehovah's Witness
Assessment Models or Tools	● Direct observation ● Multisource feedback ● Oral or written self-reflection (e.g., of a personal or observed lapse, ethical dilemma, or systems-level factors) ● Simulation
Curriculum Mapping	●
Notes or Resources	● American Medical Association. Ethics. http://www.ama-assn.org/delivering-care/ethics. 2019. ● Byyny RL, Papadakis MA, Paauw DS, Pfiel S, Alpha Omega Alpha. *Medical Professionalism Best Practices*. Menlo Park, CA: Alpha Omega Alpha Honor Medical Society; 2015. https://alphaomegaalpha.org/pdfs/2015MedicalProfessionalism.pdf. 2019. ● Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. New York, NY: McGraw-Hill Education; 2014. https://accessmedicine.mhmedical.com/book.aspx?bookID=1058. 2019. ● Bynny RL, Paauw DS, Papadakis MA, Pfeil S, Alpha Omega Alpha. *Medical Professionalism Best Practices: Professionalism in the Modern Era.* Menlo Park, CA: Alpha Omega Alpha Honor Medical Society; 2017. http://alphaomegaalpha.org/pdfs/Monograph2018.pdf. 2019.

Professionalism 2: Accountability/Conscientiousness **Overall Intent:** To take responsibility for one's own actions and the impact on patients and other members of the health care team	
Milestones	**Examples**
Level 1 *Takes responsibility for failure to complete tasks and responsibilities, identifies potential contributing factors, and describes strategies for ensuring timely task completion in the future*	● Takes responsibility for consistently coming late to rounds and identifies sleep issues with newborn at home as contributing to tardiness ● When sleep deprived, sets multiple alarms
Responds promptly to requests or reminders to complete tasks and responsibilities	● Responds promptly to reminders from program administrator to complete work hour logs
Level 2 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations*	● Performs follow-up on results to outpatients ● Addresses inbox before leaving for vacation
Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner	● Asks colleague to cover their inbox the week before board exams
Level 3 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations*	● Appropriately notifies resident on day service about overnight call events during transition of care or hand-off ● Notifies attending of multiple competing demands on call, appropriately triages tasks, and asks for assistance from other residents or faculty members, if needed
Proactively implements strategies to ensure that the needs of patients, teams, and systems are met	● When post call or on vacation, creates an away message
Level 4 *Manages situations that may impact others' ability to complete tasks and responsibilities in a timely manner*	● Senior residents advise junior residents how to manage their time in completing patient care tasks; escalates to communicating with program director if problem requires a system-based approach and needs addressing at a higher administrative level
Role models the strategies to ensure that the needs of patients, teams, and systems are met	● Takes responsibility for potential adverse outcomes and professionally discusses with the interprofessional team
Level 5 *Identifies and seeks to address system-level factors that impact completion of tasks*	● Sets up a meeting with the nurse manager to streamline patient discharges

Coaches others to develop strategies to ensure that the needs of patients, teams, and systems are met	● Coaches junior residents to do a QI project to improve clinic workflow
Assessment Models or Tools	● Compliance with deadlines and timelines ● Direct observation ● Multisource feedback ● Self-evaluations and reflective tools ● Simulation
Curriculum Mapping	●
Notes or Resources	● Code of conduct from fellow/resident institutional manual ● Expectations of residency program regarding accountability and professionalism ● Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. New York, NY: McGraw-Hill Education; 2014. https://accessmedicine.mhmedical.com/book.aspx?bookID=1058. 2019. ● Bynny RL, Paauw DS, Papadakis MA, Pfeil S, Alpha Omega Alpha. *Medical Professionalism Best Practices: Professionalism in the Modern Era.* Menlo Park, CA: Alpha Omega Alpha Honor Medical Society; 2017. http://alphaomegaalpha.org/pdfs/Monograph2018.pdf. 2019. ● AMA GME Modules on Professionalism https://edhub.ama-assn.org/gcep

Professionalism 3: Self-Awareness and Well-Being **Overall Intent:** To identify, use, manage, improve, and seek help for personal and professional well-being for self and others	
Milestones	**Examples**
Level 1 *Recognizes status of personal and professional well-being, with assistance* *Recognizes limits in knowledge/skills, with assistance*	● Accepts feedback and exhibits positive responses to constructive criticism or suggestions for change ● The attending notes that the resident was unable to elicit reflexes
Level 2 *Independently recognizes status of personal and professional well-being* *Independently recognizes limits in knowledge/skills*	● Recognizes that they are sleep deprived ● Admits to attending that the resident is not sure if the patient has reflexes or if the resident is unable to elicit
Level 3 *With assistance, proposes a plan to promote personal and professional well-being* *With assistance, proposes a plan to remediate or improve limits in knowledge/skills*	● With guidance from the program director, makes room in daily schedule for personal time and hobbies ● With guidance from program director, arranges for faculty members to observe the resident's techniques for eliciting reflexes
Level 4 *Independently develops a plan to promote personal and professional well-being* *Independently develops a plan to remediate or improve limits in knowledge/skills*	● Arranges for team-building activities to help reduce stress ● Decides to ask every attending for feedback on technique for eliciting reflexes
Level 5 *Coaches others when emotional responses or limitations in knowledge/skills do not meet professional expectations*	● Mentors colleagues in self-awareness and establishes plans to limit stress and burnout
Assessment Models or Tools	● Direct observation ● Group interview or discussions for team activities ● Individual interview ● Institutional online training modules ● Participation in institutional well-being programs ● Personal learning plan ● Self-assessment ● Self-reflection
Curriculum Mapping	●
Notes or Resources	● Local resources, including Employee Assistance

	● Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: personal and professional development. *Acad Pediatr*. 2014;14(2 Suppl):S80-97. https://www.academicpedsjnl.net/article/S1876-2859(13)00332-X/fulltext. 2019. ● ACGME. Tools and Resources. https://www.acgme.org/What-We-Do/Initiatives/Physician-Well-Being/Resources. 2019. ● National Academy of Medicine. Action collaborative on clinical well-being and resilience. https://nam.edu/initiatives/clinician-resilience-and-well-being/ Accessed 2019. ● American Academy of Neurology. Residency program wellness. https://www.aan.com/tools-and-resources/academic-neurologists-researchers/program-and-fellowship-director-resources/residency-program-wellness/ Accessed 2019.

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication **Overall Intent:** To deliberately use language and behaviors to form constructive relationships with patients, to identify communication barriers including self-reflection on personal biases, and minimize them in the doctor-patient relationships; organize and lead communication around shared decision making	
Milestones	**Examples**
Level 1 *Uses language and nonverbal behavior to demonstrate respect and establish rapport* *Identifies common barriers to effective communication while accurately communicating own role within the health care system*	● Self-monitors and controls tone, non-verbal responses, and language and asks questions to invite patient/family participation ● Accurately communicates their role in the health care system to patients/families ● Uses an interpreter as needed ● Avoids medical jargon when talking to patients, meets families where they are and communicates with appropriate level of understanding
Level 2 *Establishes a therapeutic relationship in straightforward encounters using active listening and clear language* *Identifies complex barriers to effective communication*	● Uses active listening, attention to affect, and questions that optimally explore the active issues and context when speaking with patients and families ● Identifies complex communication barriers such as a family that is unable to read the instructions for medication titration
Level 3 *Establishes a therapeutic relationship in challenging patient encounters* *When prompted, reflects on personal biases while attempting to minimize communication barriers*	● Establishes and maintains a therapeutic relationship by discussing medical management with a patient adamantly opposed to medication ● With guidance, recognizes personal bias to natural remedies
Level 4 *Easily establishes therapeutic relationships, with attention to patient/family concerns and context, regardless of complexity* *Independently recognizes personal biases while attempting to proactively minimize communication barriers*	● Establishes a therapeutic relationship with divorced parents with differing opinions on the patient's care ● Take implicit bias test to identify own biases
Level 5 *Mentors others in situational awareness and critical self-reflection to consistently develop positive therapeutic relationships*	● Educates others to take implicit bias testing and how to self-reflect and use the results

Role models self-awareness practice while identifying teaching a contextual approach to minimize communication barriers	● Is an example to others of leading shared decision making with clear recommendations to patients and families even in more complex clinical situations
Assessment Models or Tools	● Direct observation ● Kalamazoo Essential Elements Communication Checklist (Adapted) ● Self-assessment including self-reflection exercises ● Skills needed to set the state, Elicit information, Give information, Understand the patient, and End the encounter (SEGUE) ● Standardized patients or structured case discussions
Curriculum Mapping	●
Notes or Resources	● Laidlaw A, Hart J. Communication skills: an essential component of medical curricula. Part I: Assessment of clinical communication: AMEE Guide No. 51. *Med Teach*. 2011;33(1):6-8. https://www.tandfonline.com/doi/full/10.3109/0142159X.2011.531170. 2019. ● Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. *Acad Med*. 2001;76(4):390-393. https://insights.ovid.com/crossref?an=00001888-200104000-00021. 2019. ● Makoul G. The SEGUE Framework for teaching and assessing communication skills. *Patient Educ Couns*. 2001;45(1):23-34. https://www.sciencedirect.com/science/article/abs/pii/S0738399101001367?via%3Dihub. 2019. ● Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in residents. *BMC Med Educ*. 2009;9:1. https://bmcmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1. 2019.

Interpersonal and Communication Skills 2: Patient and Family Education **Overall Intent:** To effectively educate patients and use shared decision making to improve outcomes	
Milestones	**Examples**
Level 1 *Recognizes link between patient outcomes and education* *Identifies the need to adjust communication strategies based on patient/family expectations and understanding of their health status and treatment options*	● Recognizes that the patient should understand their diagnosis of epilepsy and the importance of taking their medication to prevent seizures ● Knows when to provide information to families in their native language about seizures in order to better inform them about their child's epilepsy
Level 2 *Describes methods for effective patient education* *Organizes and initiates communication with patient/family by introducing stakeholders, setting the agenda, clarifying expectations, and verifying understanding of the clinical situation*	● Tells a junior resident how to access an appropriate seizure action plan ● Coordinates additional teaching opportunities for families, such as a nursing teaching session about rescue medication for a patient with newly diagnosed epilepsy
Level 3 *Educates patients effectively in straightforward situations, including eliciting understanding of information provided* *Compassionately delivers medical information, elicits patient/family values, goals and preferences, and acknowledges uncertainty and conflict*	● Provides succinct and relevant family education on rounds, which families find helpful and understandable ● Compassionately conveys education in a conversational manner without lecturing, and continually checks in (verbally or non-verbally) to confirm patient and families' understanding
Level 4 *Educates patients effectively in complex situations* *Independently uses shared decision making to align patient/family values, goals, and preferences with treatment options to make a personalized care plan*	● For a patient with neuronal ceroid lipofuscinosis, educates the family about what is known and the limits of treatment saying, "I don't know" when that is the case and follows up appropriately ● Elicits family preferences and formulates an appropriate treatment plan taking these preferences into consideration
Level 5 *Educates patients in self-advocacy, community outreach, and activism*	● Goes to local schools to educate students and staff about epilepsy and seizure first aid

Role models shared decision making in patient/family communication, including those with a high degree of uncertainty/conflict	● Junior residents choose to attend an interdisciplinary family meeting led by the resident to become more effective communicators
Assessment Models or Tools	● Direct observation ● Multisource feedback ● Self-assessment ● Self-reflection ● Standardized patients or structured case discussions
Curriculum Mapping	●
Notes or Resources	● Parent K, Jones K, Phillips L, Stojan JN, House JB. Teaching patient and family-centered care: Integrating shared humanity into medical education curricula. *AMA J Ethics*. 2016;18(1):24-32. https://journalofethics.ama-assn.org/sites/journalofethics.ama-assn.org/files/2018-06/medu1-1601.pdf. 2019. ● Lindeman, CA. Patient education. *Annu Rev Nur Res*. 1988;6:29-60. ● Jotterand F, Amodio A, Elger BS. Patient education as empowerment and self-rebiasing. *Med Health Care Philos*. 2016;19(4):553-561. https://link.springer.com/article/10.1007%2Fs11019-016-9702-9. 2019. ● Vital Talks

Interpersonal and Communication Skills 3: Interprofessional and Team Communication **Overall Intent:** To effectively communicate with the health care team, including consultants, in both straightforward and complex situations	
Milestones	**Examples**
Level 1 *Respectfully requests and/or receives a consultation*	● Shows respect in health care team communications through words and actions
Uses language that values all members of the health care team	● Uses respectful communication to all staff members
Understands the importance of feedback	● Listens to and considers others' points of view, is nonjudgmental and actively engaged, and demonstrates humility
Level 2 *Clearly and concisely requests or responds to a consultation*	● Communicates back to referring provider the specific recommendations after performing a consult
Communicates information effectively with all members of the health care team	● When transferring a patient to a different service, communicates change to all members of the team
Solicits feedback on performance as a member of the health care team	● Asks nurses for feedback after a rotation
Level 3 *Checks own or others understanding of consultation*	● Verifies understanding of own communications by restating critical values and unexpected diagnoses using closed loop communication
Uses active listening to adapt communication style to fit team needs	● Demonstrates active listening by fully focusing on all members of the team, actively showing verbal and non-verbal signs (eye contact, posture, reflection, questioning, summarization) ● Uses good eye contact skills to recognize that a colleague disagrees with the recommendation and adjusts communication accordingly
Communicates concerns and provides feedback to peers and learners	● Respectfully and regularly provides feedback to junior members of the medical team for the purposes of improvement or reinforcement of correct knowledge, skills, and attitudes
Level 4 *Coordinates recommendations from different members of the health care team to optimize patient care*	● Incorporates recommendations from nurses to adjust medication schedule so as not to interfere with patient sleep schedule

Communicates feedback and constructive criticism to superiors	● Offers suggestions to negotiate or resolve conflicts among health care team members; raises concerns or provides opinions and feedback, when needed, to superiors on the team
Level 5 *Role models flexible communication strategies that value input from all health care team members, resolving conflict when needed* *Facilitates regular health care team-based feedback in complex situations*	● Junior residents seek advice from the resident on how to resolve conflict within the health care team ● Organizes a team meeting to discuss and resolve potentially conflicting points of view on a plan of care (e.g., therapeutic apheresis for rare neurological condition, use of rare resources)
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Self-reflection ● Simulation
Curriculum Mapping	●
Notes or Resources	● Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. *Med Teach.* 2018:1-4. https://www.tandfonline.com/doi/full/10.1080/0142159X.2018.1481499. 2019. ● Green M, Parrott T, Cook G. Improving your communication skills. *BMJ*. 2012; 344:e357. https://www.bmj.com/content/344/bmj.e357. 2019.. ● Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: a review with suggestions for implementation. *Med Teach*. 2013;35(5):395-403. https://www.tandfonline.com/doi/full/10.3109/0142159X.2013.769677. 2019. ● Fay D, Mazzone M, Douglas L, Ambuel B. A validated, behavior-based evaluation instrument for family medicine residents. *MedEdPORTAL*. 2007. https://www.mededportal.org/publication/622/. 2019. ● Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. *MedEdPORTAL*. 2015;11:10174. https://www.mededportal.org/publication/10174/. 2019. ● Lane JL, Gottlieb RP. Structured clinical observations: a method to teach clinical skills with limited time and financial resources. *Pediatrics*. 2000;105(4 Pt 2):973-977. https://www.ncbi.nlm.nih.gov/pubmed/10742358. 2019. ● Braddock CH III, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: time to get back to basics. *JAMA*. 1999;282(24):2313-2320. https://jamanetwork.com/journals/jama/fullarticle/192233. 2019.

Interpersonal and Communication Skills 4: Communication within Health Care Systems **Overall Intent:** To communicate effectively using a variety of methods	
Milestones	**Examples**
Level 1 *Accurately records information in the patient record as required by institutional policy* *Describes appropriate use of documentation shortcuts as required by institutional policy*	● Notes are accurate but may include extraneous information ● Identifies smart phrases in the electronic health record for clinic note writing
Level 2 *Demonstrates organized diagnostic and therapeutic reasoning through notes in the patient record* *Accurate, timely, and appropriate use of documentation shortcuts in formats specified by institutional policy*	● Creates organized and accurate notes that may contain extraneous information ● Uses smart phrases and templates appropriately
Level 3 *Concisely reports diagnostic and therapeutic reasoning in the patient record* *Appropriately selects direct (e.g., telephone, in-person) and indirect (e.g. progress notes, text messages) forms of communication based on context*	● Documentation is accurate, organized, and concise, but may not consistently contain contingency planning for change in condition (anticipatory guidance) ● Knows when to direct concerns locally, departmentally, or institutionally – appropriate escalation ● Uses appropriate method when sharing results needing urgent attention
Level 4 *Communicates clearly, concisely, timely, and in an organized written form, including anticipatory guidance* *Achieves written or verbal communication (patient notes, email, etc.) that serves as an example for others to follow*	● Documentation is accurate, organized, and concise and includes anticipatory guidance ● Others turn to this resident for examples of note template ● Nurses evaluate this resident as having timely notes
Level 5 *Models feedback to improve others' written communication* *Guides departmental or institutional communication around policies and procedures*	● Teaches colleagues how to improve discharge summaries ● Leads a QI initiative to improve house staff hand-offs
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit

	● Multisource feedback ● Portfolio review
Curriculum Mapping	●
Notes or Resources	● Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: validity evidence for a checklist to assess progress notes in the electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. 2019. ● Starmer AJ, Spector ND, Srivastava R, et al. I-PASS, a mnemonic to standardize verbal handoffs. *Pediatrics*. 2012;129(2):201-204. https://ipassinstitute.com/wp-content/uploads/2016/06/I-PASS-mnemonic.pdf. 2019. ● Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. *Jt Comm J Qual Patient Saf*. 2006;32(3)167-175. https://www.ncbi.nlm.nih.gov/pubmed/16617948. 2019.

In an effort to aid programs in the transition to using the new version of the Milestones, we have mapped the original Milestones 1.0 to the new Milestones 2.0. Below we have indicated where the subcompetencies are similar between versions. These are not necessarily exact matches, but are areas that include some of the same elements. Note that not all subcompetencies map between versions. Inclusion or exclusion of any subcompetency does not change the educational value or impact on curriculum or assessment.

Milestones 1.0	Milestones 2.0
PC1: History	PC1: Neurologic and Developmental History
PC2: Neurologic Exam	PC2: Neurologic Exam PC10: Determination of Death by Neurologic Criteria
PC3: Management/Treatment	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC4: Neurometabolic and Neurogenetic Disorders	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC5: Movement Disorders	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC6: Neuromuscular Disorders	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting PC9: Electromyography
PC7: Cerebrovascular Disorders	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC8: Cognitive, Behavioral, and Psychiatric Disorders	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC9: Neuroimmunologic and White Matter Disorders	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC10: Epilepsy	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC11: Headache Syndromes	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting

	PC5: Diagnosis and Management in the Outpatient Setting
PC12: Neuro-Oncology	PC3: Critical Care PC4: Diagnosis and Management in the Inpatient Setting PC5: Diagnosis and Management in the Outpatient Setting
PC12: Neuroimaging	PC6: Neuroimaging
PC13: Electroencephalogram	PC7: Electroencephalogram
PC14: Lumbar Puncture	PC8: Lumbar Puncture
MK1: Development	MK1: Development and Behavior
MK2: Localization	MK2: Localization
MK3: Formulation	MK3: Clinical Reasoning and Formulation
MK4: Diagnostic Investigation	MK4: Diagnostic Investigation
SBP1: Systems thinking, including cost- and risk-effective practice	SBP1: Patient Safety and Quality Improvement SBP3: Physician Role in Health Care Systems
SBP2: Work in inter-professional teams to enhance patient safety	SBP1: Patient Safety and Quality Improvement ICS2: Interprofessional and Team Communication
PBLI1: Self-directed Learning	PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI2: Locate, appraise, and assimilate evidence from scientific studies related to the patient's health problems	PBLI1: Evidence-Based and Informed Practice
PROF1: Compassion, integrity, accountability, and respect for self and others	PROF1: Professional Behavior and Ethical Principles PROF2: Accountability/ Conscientiousness
PROF2: Knowledge about, respect for, and adherence to the ethical principles relevant to the practice of medicine	PROF1: Professional Behavior and Ethical Principles
No match	PROF3: Self-Awareness and Well-Being
ICS1: Relationship development, teamwork, and managing conflict	ICS1: Patient and Family-Centered Communication ICS3: Interprofessional and Team Communication
ICS2: Information sharing, gathering, and technology	SBP2: System Navigation for Patient-Centered Care ICS2: Patient and Family Education ICS4: Communication within Health Care Systems