Supplemental Guide: Neurology

ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the 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.

Additional tools and references, including the Milestones Guidebook, Clinical Competency Committee Guidebook, and Milestones Guidebook for Residents and Fellows, are available on the Resources page of the Milestones section of the ACGME website.

Patient Care 1: History **Overall Intent:** To efficiently obtain a thorough history that addresses the patient's symptoms	
Milestones	**Examples**
Level 1 *Obtains a basic neurologic history*	● Collects the patient story for a two-day history of headache, including location and duration but does not ask about suddenness or activity at onset ● History is problem-focused but does not include all of the key elements needed to discriminate urgency
Level 2 *Obtains a complete and relevant neurologic history*	● Obtains a history including exact time of onset and observed deficits in patient with possible stroke
Level 3 *Obtains an organized neurologic history, including collateral information as appropriate*	● Obtains a comprehensive history from a patient reporting seizures, interviews witnesses, and subsequently reviews medical records
Level 4 *Efficiently obtains an organized hypothesis-driven neurologic history*	● Obtains a history from a patient with progressive dysphagia; asks about diurnal variation, diplopia, and thorough family history, adapting questions based on patient responses
Level 5 *Serves as a role model in obtaining a hypothesis-driven neurologic history*	● Is selected by faculty to demonstrate obtaining a history to medical students and more junior residents
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● O'Brien MD. Taking a neurological history. *Medicine*. 2004;32(9):1-6. https://www.medicinejournal.co.uk/article/S1357-3039(06)00152-6/pdf. 2020.

Patient Care 2: Neurologic Exam **Overall Intent:** To perform an accurate, comprehensive neurologic exam which identifies abnormalities and localizes to the dysfunctional regions of the nervous system	
Milestones	**Examples**
Level 1 *Performs some components of a neurologic exam*	● Examines a patient with symptoms of sensory loss and only uses cursory light touch testing to assess the deficit
Level 2 *Performs a standard neurologic exam accurately*	● Examines a patient with positional dizziness and performs a complete cranial nerve and cerebellar exam, but fails to perform a Dix-Hallpike maneuver
Level 3 *Performs a relevant neurologic exam incorporating additional appropriate maneuvers*	● Includes a head-impulse-nystagmus-test-of-skew (HINTS) exam in a patient with persistent vertigo
Level 4 *Performs a hypothesis-driven neurologic exam*	● In the appropriate setting, proceeds to an apnea test in a comatose patient without brainstem reflexes
Level 5 *Serves as a role model for performing a hypothesis-driven, complete, relevant, and organized neurologic exam*	● Is selected to teach junior learners the neurologic exam ● Demonstrates key exam maneuvers to localize a lesion to the lateral medulla
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● Brain death guidelines are subject to change ● Wijdicks EFM, Varelas PN, Gronseth GS, Greer DM. Evidence-based guideline update: Determining brain death in adults. *Neurology*. 2010;74(23):1911-1918. https://n.neurology.org/content/74/23/1911. 2020.

Patient Care 3: Formulation **Overall Intent:** To use information gathered in the history and physical exam, localize the lesion, and generate a relevant differential diagnosis	
Milestones	**Examples**
Level 1 *Summarizes history and exam findings*	● Gathers a history of chronic progressive sensory loss in the feet, identifies a distal neuropathy on exam, but is unable to discuss potential etiologies or next steps
Level 2 *Generates a broad differential diagnosis based on history, exam, and localization*	● Evaluates a patient with aphasia and generates a differential for expressive aphasia to include acute ischemic stroke, tumor, primary progressive aphasia, and ictal aphasia
Level 3 *Synthesizes relevant information to focus and prioritize diagnostic possibilities*	● Evaluates a patient for loss of consciousness; obtains a history of palpitations and light-headedness, without a postictal state and with a normal exam; prioritizes convulsive syncope over seizure in the differential diagnosis
Level 4 *Continuously reconsiders diagnosis in response to changes in clinical circumstances and available data*	● Examines a patient with paraparesis and lower extremity areflexia with a working diagnosis of acute inflammatory demyelinating polyneuropathy; reconsiders the localization to include a spinal cord lesion after the patient develops a sensory level the next day
Level 5 *Serves as a role model for clinical reasoning by demonstrating sophisticated formulation in complex presentations*	● Publishes a case report demonstrating clinical reasoning
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● The Society to Improve Diagnosis in Medicine. Inter-Professional Consensus Curriculum on Diagnosis and Diagnostic Error. https://www.improvediagnosis.org/consensuscurriculum/ 2020. ● SIDM. Assessment of Reasoning Tool. https://www.improvediagnosis.org/art/. 2020. ● SIDM. Driver Diagram. https://www.improvediagnosis.org/wp-content/uploads/2018/10/Driver_Diagram_-_July_31_-_M.pdf. 2020.

Patient Care 4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting **Overall Intent:** To diagnose, manage, and follow patients with neurologic disorders in the outpatient setting	
Milestones	**Examples**
Level 1 *Identifies typical presentations of commonly encountered neurologic conditions*	● Describes that a migraine with aura typically presents with throbbing headache preceded by “seeing zigzag lines”
Level 2 *Diagnoses commonly encountered neurologic conditions* *Develops an initial treatment plan for commonly encountered neurologic disorders*	● Diagnoses cluster headache in a patient presenting with unilateral pain based on the duration, periodicity, and associated features ● Prescribes acute, transitional, and preventative therapy for cluster headache
Level 3 *Identifies atypical presentations of commonly encountered neurologic conditions* *Individualizes management and follow-up plan for commonly encountered neurologic disorders, considering risks, benefits, and non-pharmacologic strategies*	● Considers the diagnosis of amyotrophic lateral sclerosis (ALS) in a patient with progressive dysphagia without limb weakness ● Avoids medications such as triptans in a patient with cluster headache and a history of coronary artery disease; screens for suicide risk; counsels for smoking and alcohol cessation
Level 4 *Diagnoses uncommon neurologic conditions* *Adapts management plan based upon patient response and complications of therapy; identifies when to change acuity of care*	● Diagnoses Fragile X tremor-ataxia syndrome in a patient presenting with a gait disorder and tremor whose grandson has Fragile X syndrome ● Discontinues calcium channel blockers after patient with cluster headache develops symptomatic bradycardia and recommends evaluation in the emergency department
Level 5 *Identifies atypical presentations of uncommon neurologic conditions* *Longitudinally manages uncommon neurologic conditions*	● Recognizes that a patient with diffuse muscle pain without weakness could have a myotonic disorder ● Manages a patient with neuropathy due to familial amyloidosis with symptom-based and disease-specific treatments over time
Assessment Models or Tools	● Case conference assessment ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● Daroff RB, Jankovic J, Mazziotta JC, Pomeroy SL. *Bradley's Neurology in Clinical Practice, 2-Volume Set*. 7th ed. Philadelphia, PA:Elsevier; 2015.

	● Lewis SL. Selected topics in outpatient neurology. *Continuum*. 2017;23(2). https://journals.lww.com/continuum/toc/2017/04000. 2020.

Patient Care 5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting **Overall Intent:** To diagnose and manage patients with neurologic disorders in the emergency department and hospital units	
Milestones	**Examples**
Level 1 *Identifies typical presentations of commonly encountered neurologic conditions*	● Describes that a patient presenting with acute focal neurologic deficits likely has an acute ischemic stroke
Level 2 *Diagnoses commonly encountered neurologic conditions* *Develops an initial treatment plan for commonly encountered neurologic disorders*	● Diagnoses a right middle cerebral artery territory ischemic stroke in a patient that presents with left hemiparesis and neglect and a normal head computerized tomography (CT) scan ● Begins intravenous immunoglobulin or plasma exchange therapy for a patient with Guillain-Barre Syndrome and institutes cardiac and respiratory monitoring
Level 3 *Identifies atypical presentations of commonly encountered neurologic conditions* *Individualizes management plan, ensuring the appropriate level of care throughout hospitalization and upon discharge*	● Considers the possibility of myasthenia gravis in an intensive care unit (ICU) patient with pneumonia who is unable to be weaned from mechanical ventilation, despite no previous neurologic history ● Arranges intubation and avoids aggressive blood pressure management in a patient with Guillain-Barre Syndrome who has a declining forced vital capacity and fluctuating hypertension ● Works with case management to discharge patient to an appropriately safe environment
Level 4 *Diagnoses uncommon neurologic conditions* *Adapts management plan based upon treatment response, disease progression, and complications of therapy*	● Diagnoses pituitary apoplexy in a patient who presents with thunderclap headache and bilateral ophthalmoparesis ● Applies an algorithmic approach to a patient with status epilepticus who does not improve despite initial therapy and escalates therapy in a timely fashion
Level 5 *Identifies atypical presentations of uncommon neurologic conditions* *Leads the management of patients with complex and uncommon neurologic conditions*	● Considers Creutzfeldt-Jakob disease in a patient presenting with falls and ataxia ● Initiates and modifies treatment in a patient with neurosarcoidosis based on disease response and/or progression
Assessment Models or Tools	● Case conference assessment ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●

Notes or Resources	● Alpert NJ. *The Neurologic Diagnosis: A Practical Bedside Approach.* 2nd ed. Houston, TX: Springer; 2019.

Patient Care 6: Diagnosis and Management of Neurologic Emergencies **Overall Intent:** To diagnose, treat, and manage patients with neurologic emergencies in any care setting	
Milestones	**Examples**
Level 1 *Describes the typical presentation of neurologic emergencies* *Seeks assistance and conveys pertinent details during a neurologic emergency*	● Describes that a patient presenting with bilateral weakness, sensory level, and sphincter disturbance may have an acute spinal cord compression ● Immediately contacts the senior resident or faculty with concern for a possible cord compression
Level 2 *Recognizes when a patient's presentation is a neurologic emergency* *Initiates management for a neurologic emergency*	● Recognizes that a patient with a sudden onset headache needs emergent assessment for subarachnoid hemorrhage despite negative structural imaging ● Orders benzodiazepine and initiates anticonvulsant therapy for a patient in status epilepticus ● Calls an acute stroke code and orders appropriate imaging for a patient with probable acute stroke
Level 3 *Diagnoses neurologic emergencies, using appropriate diagnostic testing* *Manages patients with common neurologic emergencies*	● Recommends continuous electroencephalogram (EEG) monitoring for a patient with persistent confusion to assess for non-convulsive status epilepticus. ● Orders intravenous dexamethasone therapy and calls for emergent neurosurgical consultation for a patient with spinal cord compression from tumor ● Initiates intravenous anticoagulation for a patient with venous sinus thrombosis
Level 4 *Re-appraises diagnostic considerations based on treatment response, disease progression, and complications of therapy* *Manages complex neurologic emergencies*	● Recognizes intracerebral hemorrhage in a patient receiving an intravenous tissue plasminogen activator for acute stroke; discontinues thrombolytic therapy; calls for emergent neurosurgical consultation ● Manages neuroleptic malignant syndrome
Level 5 *Serves as a role model for management of neurologic emergencies*	● Develops a multidisciplinary pathway for patients with a neurologic emergency
Assessment Models or Tools	● Case conference assessment ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● Wijdicks EFM. *Identifying Neuroemergencies*. New York, NY: Oxford University Press; 2015.

Patient Care 7: Determination of Death by Neurologic Criteria **Overall Intent:** To perform examination to determine death by neurologic criteria and discuss its implications	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of medical and legal significance of death by neurologic criteria*	● Describes death by neurologic criteria as the complete and permanent loss of brain function ● Identifies how to access relevant state legal requirements, hospital protocols, and relevant published guidelines
Level 2 *Lists the components for determining death by neurologic criteria*	● Understands that hypothermia and other confounders need correction prior to performance of brain death examination ● Describes how to perform all exam components
Level 3 *Describes supplemental testing used to determine death by neurologic criteria*	● Understands clinical scenarios in which supplemental testing is appropriate ● Lists potential supplemental testing modalities that may be used
Level 4 *Accurately performs determination of death by neurologic criteria*	● Correctly performs all aspects and maneuvers (e.g., oculovestibular testing, apnea test) of the brain death examination
Level 5 *Educates others in the determination of death by neurologic criteria, including appropriate use of supplemental testing, as well as controversies*	● Gives a didactic session (e.g., lecture, simulation course) on how to correctly perform all aspects of the brain death examination
Assessment Models or Tools	● Case-based discussion ● Chart review ● Direct observation ● Simulation
Curriculum Mapping	●
Notes or Resources	● Greer DM, Shamie SD, Lewis A, et al. Determination of brain death/death by neurologic criteria: The World Brain Death Project. *JAMA*. 2020;324(11):1078-1097. doi:10.1001/jama.2020.11586 ● Widjicks EFM, Varelas PN, Gronseth GS, Greer DM. Evidence-based guideline update: Determining brain death in adults; Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*. 2010; 74(23):1911-1918. DOI: https://doi.org/10.1212/WNL.0b013e3181e242a8

Patient Care 8: Interpretation of Neuroimaging **Overall Intent:** To interpret commonly used neuroimaging modalities in the context of a patient's presentation	
Milestones	**Examples**
Level 1 *Identifies basic neuroanatomy on brain and vascular anatomy of the head and neck magnetic resonance (MR) and computed tomography (CT)*	● Identifies major lobes of the brain and regions of the brain stem ● Identifies large- and medium-size vessels of the head and neck
Level 2 *Identifies major abnormalities of the brain and cerebrovascular system on MR and CT* *Identifies basic anatomy of the spine and spinal cord on MR and CT*	● Distinguishes subdural from epidural hemorrhage ● Identifies the spinal cord, conus medullaris, and cauda equina
Level 3 *Interprets typical abnormalities of the brain and cerebrovascular system on MR and CT* *Identifies abnormalities of the spine and spinal cord on MR and CT*	● Identifies a hyperdense artery suggestive of large vessel occlusion on CT ● Identifies a T2 hyperintense lesion on sagittal and axial magnetic resonance imaging (MRI) of the spinal cord
Level 4 *Interprets subtle abnormalities of brain and cerebrovascular system on MR and CT* *Interprets MR and CT of the spine*	● Interprets cortical restricted diffusion as a possible post-ictal phenomenon in a patient with recent status epilepticus ● Interprets acute spinal cord compression due to epidural hematoma
Level 5 *Interprets advanced neuroimaging*	● Interprets conventional angiography, transcranial Doppler, magnetic resonance (MR) perfusion/spectroscopy ● Interprets cerebral angiogram to diagnose moyamoya
Assessment Models or Tools	● Case-based discussion ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● Online modules ● Osborn AG, Digre KB. *Imaging in Neurology.* 1st ed. Philadelphia, PA: Elsevier; 2016.

Patient Care 9: Electroencephalogram (EEG) **Overall Intent:** To interpret EEG and generate a report	
Milestones	**Examples**
Level 1 *Identifies patients for whom EEG is appropriate*	● Orders EEG in a patient with unexplained loss of consciousness suggestive of seizure
Level 2 *Recognizes normal EEG features, including common artifacts, in children and adults*	● Identifies normal sleep architecture in children and adults
Level 3 *Recognizes patterns of status epilepticus, normal EEG variants, and common abnormalities in children and adults*	● Identifies hypsarrhythmia in a child with infantile spasms ● Identifies mu rhythm in an adult
Level 4 *Interprets common EEG abnormalities and patterns that could represent status epilepticus*	● Interprets temporal lobe spikes as a possible seizure focus in an EEG report
Level 5 *Interprets uncommon EEG abnormalities and creates a report*	● Identifies alpha coma pattern in patient status post-cardiac arrest
Assessment Models or Tools	● Case-based discussion ● Direct observation ● EEG report review ● Simulation
Curriculum Mapping	●
Notes or Resources	● Krauss GL, Fisher RS, Kaplan PW. *The Johns Hopkins Atlas of Digital EEG: An Interactive Training Guide*. 2nd ed. Baltimore, MD: Johns Hopkins University Press; 2011.

Patient Care 10: Nerve Conduction Study/Electromyogram (NCS/EMG) **Overall Intent:** To select the appropriate NCS/EMG studies and interpret the data for common clinical presentations	
Milestones	**Examples**
Level 1 *Identifies patients for whom NCS/EMG is appropriate*	● Orders an NCS/EMG in a patient with suspected amyotrophic lateral sclerosis
Level 2 *Identifies NCS/EMG findings for common disorders*	● Identifies focal slowing of median nerve conduction velocities across the wrist as electrophysiologic support for carpal tunnel syndrome
Level 3 *Correlates NCS/EMG results to patient presentation, including identification of potential study limitations*	● Recognizes conduction velocity slowing may be due to low limb temperature ● Recognizes that normal nerve conduction study does not rule out small fiber neuropathy
Level 4 *Formulates basic NCS/EMG plan and interprets data for common clinical presentations*	● Creates a plan for NCS/EMG to evaluate a patient with foot drop and uses the data to correctly localize the lesion
Level 5 *Performs, interprets, and creates a report for NCS/EMG*	● Performs NCS/EMG and writes report for a patient with lumbar radiculopathy
Assessment Models or Tools	● Case-based discussion ● Direct observation ● Report review ● Simulation
Curriculum Mapping	●
Notes or Resources	● Preston DC, Shapiro BE. *Electromyography and Neuromuscular Disorders: Clinical-Electrophysiologic Correlations (Expert Consult)*. 2nd ed. Philadelphia, PA: Elsevier; 2005.

Patient Care 11: Lumbar Puncture **Overall Intent:** To independently perform a lumbar puncture	
Milestones	**Examples**
Level 1 *Lists the indications, contraindications, and complications for lumbar puncture*	● Identifies patient on anticoagulant cannot undergo a lumbar puncture due to risk ● Recognizes the role of lumbar puncture in diagnosing Guillain-Barre Syndrome
Level 2 *Performs lumbar puncture under direct supervision*	● Performs lumbar puncture on a simulator or patient with attending or supervising resident present
Level 3 *Performs lumbar puncture without direct supervision and manages complications*	● Independently performs lumbar puncture ● Orders epidural blood patch for low pressure headache
Level 4 *Performs lumbar puncture on patients with challenging anatomy*	● Performs lumbar puncture on patient with high body mass index (BMI)
Level 5 *Performs lumbar puncture using image guidance*	● Performs lumbar puncture with the use of ultrasound
Assessment Models or Tools	● Direct observation ● Simulation
Curriculum Mapping	●
Notes or Resources	● Johnson KS, Sexton DJ. Lumbar puncture: technique, indications, contraindications and complications in adults. Waltham, MA: UpToDate; 2015. https://www.uptodate.com/contents/lumbar-puncture-technique-indications-contraindications-and-complications-in-adults. 2020.

Patient Care 12: Psychiatric and Functional Aspects of Neurology **Overall Intent:** To recognize the interaction between psychiatric and neurologic disease and incorporate this recognition into the treatment plan	
Milestones	**Examples**
Level 1 *Recognizes contributions of common psychiatric disorders and their treatment to neurologic diseases*	● Identifies tardive dyskinesia in a patient on a long-term neuroleptic medication
Level 2 *Develops a treatment plan that considers psychiatric comorbidities and side effects of psychiatric medications*	● Contacts a patient's mental health provider to consider an antidepressant that would manage neuropathic pain and comorbid depression
Level 3 *Accurately differentiates psychiatric or functional contributions to neurologic symptoms*	● Recognizes a positive Hoover's sign in a patient with unilateral leg weakness
Level 4 *Leads a discussion with a patient and/or caregiver that explains the psychiatric or functional contribution to the patient's neurologic symptoms*	● Discusses a new diagnosis of non-epileptic seizures with a patient and/or caregiver ● Explains to a patient and/or caregiver when there is comorbid depression as a component of the patient's pain
Level 5 *Develops a shared management plan that addresses the psychiatric or functional contribution to neurologic symptoms*	● Works with patient and/or caregiver to create a management plan that includes cognitive behavioral therapy and physical therapy for a functional gait disorder
Assessment Models or Tools	● Case-based discussion ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation standardized patients
Curriculum Mapping	●
Notes or Resources	● Feinstein A. Conversion disorder. *Continuum.* 2018;24(3):861-872. https://journals.lww.com/continuum/Abstract/2018/06000/Conversion_Disorder.13.aspx. 2020. ● Hallett M, Stone J, Carson AJ. *Functional Neurologic Disorders (Handbook of Clinical Neurology (Volume 139)).* 1st ed. Cambridge, MA: Elsevier; 2016.

Medical Knowledge 1: Localization **Overall Intent:** To use findings from the history and examination to determine the site of the patient's neurologic dysfunction	
Milestones	**Examples**
Level 1 *Recognizes the role of localization in neurologic diagnosis*	● Describes the importance of localizing the lesion prior to making a differential diagnosis
Level 2 *Localizes lesions to general regions of the nervous system*	● Differentiates between a neuropathy, radiculopathy, or myelopathy in a patient with lower extremity numbness ● Differentiates a cortical versus subcortical infarct
Level 3 *Localizes lesions to specific regions of the nervous system*	● Localizes the lesion to radial nerve or brachial plexus in a patient with wrist drop
Level 4 *Localizes lesions to discrete structures of the nervous system*	● Localizes the lesion to the left medial longitudinal fasciculus in the pons in a patient with a left internuclear ophthalmoplegia ● Identifies a lateral medullary syndrome
Level 5 *Consistently demonstrates sophisticated and detailed knowledge of neuroanatomy in localizing lesions*	● Identifies the affected region of the sympathetic pathway in a patient with Horner's syndrome
Assessment Models or Tools	● Case-based discussion ● Direct observation ● Medical record (chart) audit ● Simulation
Curriculum Mapping	●
Notes or Resources	● Brazis P, Masdeu JC, Biller J. *Localization in Clinical Neurology.* 7th ed. Philadelphia, PA: Wolters Kluwer; 2016.

Medical Knowledge 2: Diagnostic Investigation **Overall Intent:** To develop a hypothesis-driven and individualized diagnostic approach	
Milestones	**Examples**
Level 1 *Discusses a general diagnostic approach appropriate to clinical presentation*	● Lists the lab tests, imaging, and EEG evaluation for a patient with new-onset seizure
Level 2 *Lists indications, contraindications, risks, and benefits of diagnostic testing*	● Discusses the risks and benefits of IV contrast in neurologic imaging
Level 3 *Prioritizes and interprets diagnostic tests appropriate to clinical urgency and complexity*	● Orders echocardiography in appropriately selected stroke patients, rather than in every stroke patient ● Recognizes patent foramen ovale may not be causative in a stroke patient, even when one is present
Level 4 *Uses complex diagnostic approaches in uncommon situations*	● Orders a focused genetic panel to identify a cause for limb-girdle weakness
Level 5 *Demonstrates sophisticated knowledge of diagnostic testing and controversies*	● Discusses implications of pre-clinical functional imaging for dementia
Assessment Models or Tools	● Case based assessment ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	●

Systems-Based Practice 1: Patient Safety **Overall Intent:** To engage in the analysis and management of patient safety events, including relevant communication with patients, families, and health care professionals	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of commonly reported patient safety events* *Demonstrates knowledge of how to report patient safety events*	● Has basic knowledge about the definition of patient safety events and reporting pathways
Level 2 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems*	● Identifies and reports a medication error caused by inadequate hand-off
Level 3 *Participates in analysis of patient safety events* *Participates in disclosure of patient safety events to patients and patients' families*	● Participates in a root cause analysis for a medication error and attends a family meeting to disclose
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies* *Discloses patient safety events to patients and patients' families*	● Collaborates in the analysis of a medication error to improve the hand-off process ● Discloses a medication error to patients/families
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*	● Engages appropriate stakeholders to improve awareness of stroke symptoms and provide training in the hospital and community ● Leads a simulation for junior residents in error disclosure
Assessment Models or Tools	● Chart audit ● Direct observation ● Documentation of patient safety project ● E-module multiple choice tests ● Multisource feedback ● Portfolio ● Simulation

Curriculum Mapping	●
Notes or Resources	● Institute of Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. 2020.

Systems-Based Practice 2: Quality Improvement (QI) **Overall Intent:** To conduct a QI project	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of basic quality improvement methodologies and metrics*	● Has basic knowledge about the definition of QI strategies
Level 2 *Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)*	● Describes initiatives to decrease door to needle times for tissue plasminogen activator administration
Level 3 *Participates in local quality improvement initiatives*	● Participates in a QI project, though may not have yet designed a QI project
Level 4 *Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project*	● Designs a QI project that will allow for urgent referrals to be seen in a timely fashion
Level 5 *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	● Analyzes and publishes the findings of a QI project to improve awareness of stroke symptoms within the community
Assessment Models or Tools	● Chart audit ● Direct observation ● Documentation of QI project ● E-module multiple choice tests ● Multisource feedback ● Portfolio ● Simulation
Curriculum Mapping	●
Notes or Resources	● Institute of Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. 2020.

Systems-Based Practice 3: 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 the members of the interprofessional team
Performs safe and effective transitions of care/hand-offs in routine clinical situations	● Lists the essential components of an effective sign-out and care transition, including sharing information necessary for successful transitions
Demonstrates knowledge of population and community health needs and disparities	● Identifies components of social determinants of health and how they impact the delivery of patient care
Level 2 *Coordinates care of patients in routine clinical situations effectively using the roles of the interprofessional team members*	● Contacts social worker and pharmacist to get assistance for obtaining antiepileptic medication begun in the hospital
Performs safe and effective transitions of care/hand-offs in complex clinical situations	● Provides anticipatory guidance to night float team about a patient with new onset Guillain-Barre Syndrome with fluctuating blood pressure
Identifies specific population and community health needs and inequities for the local population and community	● Identifies patients at risk for specific health outcomes related to health literacy concerns
Level 3 *Coordinates care of patients in complex clinical situations effectively using the roles of the interprofessional team members*	● Coordinates care of a patient with myotonic dystrophy with other health care professionals
Supervises transitions of care by other team members	● Supervises more junior residents when patients are transitioned from ICU to a step-down unit
Effectively uses local resources to meet the needs of a patient population and community	● Works with community palliative care and hospice teams for patients with ALS
Level 4 *Role models effective coordination of patient-centered care among different disciplines and specialties*	● Leads a multidisciplinary team meeting for a patient with infectious endocarditis to determine treatment course

Role models safe and effective transitions of care/hand-offs within and across health care delivery systems, including outpatient settings *Adapts practice to provide for the needs of specific populations*	● Leads a multidisciplinary discharge conference for the transition of a patient from the hospital to a rehabilitation facility ● Works with program director to alter clinic hours for working patients
Level 5 *Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes* *Leads innovations in adapting practice and systems for populations and communities with health care disparities*	● Designs a transitional clinic from pediatric to adult care for patients with neurologic disorders ● Designs a curriculum on social determinants of health ● Develops a telehealth program for outlying clinics
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● Centers for Disease Control and Prevention. Population Health Training. https://www.cdc.gov/pophealthtraining/whatis.html. 2020. ● Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science.* 1st ed. Philadelphia, PA: Elsevier; 2016. https://commerce.ama-assn.org/store/ui/catalog/productDetail?product_id=prod2780003. 2020.

Systems-Based Practice 4: Physician Role in Health Care Systems **Overall Intent:** To understand own role 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 *Describes basic health care payment systems, (e.g., government, private, public, uninsured care) and practice models* *Identifies basic knowledge domains for effective transition to practice (e.g., information technology, legal, billing and coding, financial, personnel)*	● Recognizes there are different payment systems, such as Medicare, Medicaid, Veterans Affairs (the VA), and commercial third-party payers ● Understands the impact of health plan features, including formularies ● Understands proper documentation is required for billing and coding
Level 2 *Delivers patient-centered care, considering the patient's economic constraints* *Demonstrates use of information technology required for medical practice (e.g., electronic health record, documentation required for billing and coding)*	● Completes documentation to obtain approval for prior authorization ● Applies appropriate coding, with supervision, in compliance with regulations
Level 3 *Engages with patients in shared decision making, informed by each patient's payment models* *Consistently demonstrates timely and accurate documentation, including coding and billing requirements*	● Uses shared decision making and adapts choice of testing depending on the relevant clinical needs ● Completes notes for patient encounters within timeframe established by the institution
Level 4 *Uses available resources to promote optimal patient care (e.g., community resources, patient assistance resources) considering each patient's payment model* *Implements changes in individual practice patterns in response to professional requirements and in preparation for practice*	● Reviews patient's formulary and chooses an appropriate medication that will be covered by insurance or identifies programs to provide financial support for medication coverage ● Develops a post-residency plan for individual practice or additional education
Level 5 *Advocates for systems change that enhances high-value, efficient, and effective patient care*	● Improves informed consent process for non-English-speaking patients requiring interpreter services

Educates others to prepare them for transition to practice	● Works with state medical association to advocate for access to neurologic care
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit
Curriculum Mapping	●
Notes or Resources	● Agency for Healthcare Research and Quality. Measuring the Quality of Physician Care. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. 2020. ● Dzau VJ, McClellan MB, McGinnis JM, 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/. 2020. ● The Commonwealth Fund. Health Reform Resource Center. http://www.commonwealthfund.org/interactives-and-data/health-reform-resource-center#/f:@facasubcategoriesfacet63677=[Individual%20and%20Employer%20Responsibility. 2020. ● The Kaiser Family Foundation. www.kff.org. 2020.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice **Overall Intent:** To incorporate evidence from varied sources to optimize patient care, and to critically appraise the sources and analyze conflicting evidence	
Milestones	**Examples**
Level 1 *Demonstrates how to access and use available evidence, and to incorporate patient preferences and values to care for a routine patient*	● Searches for appropriate evidence-based guidelines for a patient with new onset epilepsy
Level 2 *Articulates clinical questions and elicits patient preferences and values to guide evidence-based care*	● Asks about patient preferences for nutritional support in advanced neurologic disorders and searches literature for available options
Level 3 *Locates and applies the best available evidence, integrated with patient preference, to the care of complex patients*	● Applies evidence for alternate rescue therapy in a patient with myasthenia gravis who declines blood products
Level 4 *Critically appraises and applies evidence, even in the face of uncertainty, and interprets conflicting evidence to guide care, tailored to the individual patient*	● Accesses the primary literature to address a unique clinical situation when the evidence is unclear or emerging ● Identifies new evidence that challenges current practice and appropriately applies
Level 5 *Coaches others to critically appraise and apply evidence for complex patients, and/or participates in the development of guidelines*	● Teaches an evidence-based medicine course
Assessment Models or Tools	● Direct observation ● Journal club assessment ● Presentation
Curriculum Mapping	●
Notes or Resources	● U.S. National Library of Medicine. PubMed Tutorial. https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html. 2020.

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth **Overall Intent:** To seek performance data and develop a learning plan	
Milestones	**Examples**
Level 1 *Accepts responsibility for personal and professional development by establishing goals*	● Establishes educational goals
Identifies the factors that contribute to gap(s) between expectations and actual performance	● Identifies that lack of experience and review of the literature contributes to performance gaps
Actively seeks opportunities to improve	● Seeks feedback from other team members
Level 2 *Demonstrates openness to performance data (feedback and other input) to inform goals*	● Identifies gaps in diagnostic skills using feedback from others ● Seeks opportunity to improve communication skills
Analyzes and reflects on the factors that contribute to gap(s) between expectations and actual performance	● Analyzes a low subsection score on the Residency In-service Training Examination (RITE) and recognizes lack of exposure as a cause
Designs and implements a learning plan, with prompting	● Meets with mentor to select elective experiences to remedy performance gaps
Level 3 *Seeks performance data sporadically, with adaptability and humility*	● Takes input from peers/colleagues and supervisors to gain complex insight into personal strengths and weaknesses ● Accepts feedback in an appreciative and non-defensive manner
Institutes behavioral change(s) to narrow the gap(s) between expectations and actual performance	● Implements a structured reading plan
Independently creates and implements a learning plan	● Independently selects elective experiences to remedy performance gaps
Level 4 *Seeks performance data consistently*	● Establishes a quarterly meeting with a mentor to review continuity clinic performance data
Challenges assumptions and considers alternatives in narrowing the gap(s) between expectations and actual performance	● Proposes study sessions with colleagues on specific topics

Uses performance data to measure the effectiveness of the learning plan, and, when necessary, improves it	● Reviews yearly RITE scores and revises the learning plan
Level 5 *Role models seeking performance data, with adaptability and humility* *Coaches others on reflective practice* *Facilitates the design and implementation of learning plans for others*	● Discusses personal successes and challenges in performance gaps with more junior residents ● Counsels others in effective team dynamics ● Mentors more junior residents in review of performance data and advises on design of learning plan
Assessment Models or Tools	● Direct observation ● Multisource feedback ● Portfolios ● Review of individual learning plans and rotation schedule ● RITE exam
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_Correlates_of_Physicians__Lifelong.21.aspx. 2020. ● 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. 2020.

Professionalism 1: Professional Behavior and Ethical Principles **Overall Intent:** To demonstrate ethical/professional behaviors and use resources to address ethical/professional conflicts	
Milestones	**Examples**
Level 1 *Identifies and describes potential triggers for professionalism lapses and how to report* *Demonstrates knowledge of ethical principles related to patient care*	● Understands that sleep deprivation can be a trigger for a lapse in professionalism ● Demonstrates knowledge of system to report breaches of professionalism in own institution ● Discusses the basic principles underlying ethics and professionalism and how they apply in various situations
Level 2 *Demonstrates insight into professional behavior in routine situations and takes responsibility* *Analyzes straightforward situations using ethical principles*	● Acts professionally in daily interactions ● Acknowledges lapses without becoming defensive, making excuses, or blaming others, and takes steps to make amends ● Monitors and responds to fatigue, hunger, stress, etc. in self and team members ● Applies ethical principles to straightforward informed consent
Level 3 *Demonstrates professional behavior in complex or stressful situations* *Analyzes complex situations using ethical principles*	● Navigates situations while under stress or when there are system barriers ● Applies ethical principles to end-of-life situations
Level 4 *Intervenes to prevent professionalism lapses in oneself and others* *Recognizes and uses appropriate resources for managing and resolving ethical dilemmas as needed*	● Assumes positive intent in evaluating others' perspective ● Takes action to help colleague who is distressed or using substances ● Requests ethics consult for patients who are unable to make their own decisions
Level 5 *Coaches others when their behavior fails to meet professional expectations* *Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution*	● Serves as peer advisor about professional expectations and behavior ● Serves as the resident member of the Institutional Review Board (IRB), Ethics, or Peer-Review Committee ● Identifies and works to resolve institutional policies that contribute to clinician stress
Assessment Models or Tools	● Case-based assessment ● Direct observation ● Multisource feedback

	● Simulation
Curriculum Mapping	●
Notes or Resources	● American Medical Association. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. 2020. ● Bernat JL. *Ethical Issues in Neurology*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008. ● Bynny RL, Paauw DS, Papadakis MA, Pfeil S. *Medical Professionalism Best Practices: Professionalism in the Modern Era*. Aurora, CO: Alpha Omega Alpha Medical Society; 2017. *Medical Professionalism Best Practices: Professionalism in the Modern Era*. Aurora, CO: Alpha Omega Alpha Medical Society; 2017. http://alphaomegaalpha.org/pdfs/Monograph2018.pdf. 2020. ● Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. New York, NY: McGraw-Hill Education; 2014.

Professionalism 2: Accountability/Conscientiousness **Overall Intent:** To take responsibility for one's actions and the impact of one's behavior on patients and members of the 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* *Responds promptly to requests or reminders to complete tasks and responsibilities*	● Adapts workflow to improve timeliness of note completion ● Has timely attendance at conferences ● 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* *Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner*	● Completes and documents safety modules, procedure review, and licensing requirements on time ● Completes accurate documentation without copy/paste errors ● Proactively recognizes it may be difficult to complete a task before going out of town and makes plans accordingly
Level 3 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations* *Proactively implements strategies to ensure that the needs of patients, teams, and systems are met*	● Triages multiple consults and phone calls to provide timely, safe, and comprehensive care ● Asks for assistance from other residents or faculty members when needed ● Adopts solutions developed through QI projects
Level 4 *Recognizes situations in which one's own behavior may impact others' ability to complete tasks and responsibilities in a timely manner*	● Demonstrates awareness of others' interdependence upon them in team-based activities ● Addresses team issues that impede efficient completion of patient care tasks ● Redistributes team workload to ensure equitable balance
Level 5 *Develops or implements strategies to improve system-wide problems to improve ability for oneself and others to complete tasks and responsibilities in a timely fashion*	● Establishes daily nurse manager meetings to streamline patient discharges
Assessment Models or Tools	● Compliance with deadlines and timelines ● Direct observation ● Multisource feedback

	● Self-evaluations and reflective tools ● Simulation
Curriculum Mapping	●
Notes or Resources	● AMA. Ethics. https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/principles-of-medical-ethics.pdf. 2020. ● Code of conduct from fellow/resident institutional manual ● Expectations of residency program regarding accountability and professionalism

Professionalism 3: Well-Being **Overall Intent:** To develop a plan for personal and professional well-being	
Milestones	**Examples**
Level 1 *Recognizes sense of personal and professional well-being, with assistance*	● Discusses the impact of burnout on well-being
Level 2 *Independently recognizes status of personal and professional well-being*	● Knows how to access local mental health resources ● Attends institutional lecture on available resources
Level 3 *With assistance, proposes a plan to optimize personal and professional well-being*	● Works with a mentor to optimize work-life integration
Level 4 *Independently develops a plan to optimize personal and professional well-being*	● Organizes group outing for co-residents
Level 5 *Coaches others when emotional responses or limitations in knowledge/ skills do not meet professional expectations*	● Develops a departmental or institutional wellness program
Assessment Models or Tools	● Direct observation ● Group interview or discussions for team activities ● Individual interview ● Institutional online training modules
Curriculum Mapping	●
Notes or Resources	● This subcompetency is not intended to evaluate a resident's well-being. Rather, the intent is to ensure that each resident has the fundamental knowledge of factors that impact well-being, the mechanism by which those factors impact well-being, and available resources and tools to improve well-being. ● Accreditation Council for Graduate Medical Education. Tools and Resources. https://www.acgme.org/What-We-Do/Initiatives/Physician-Well-Being/Resources. 2020. ● Local resources, including Employee Assistance

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication **Overall Intent:** To deliberately use language and behaviors to form constructive relationships with patients	
Milestones	**Examples**
Level 1 *Uses language and non-verbal behavior to demonstrate respect and establish rapport* *Identifies the need to individualize communication strategies based on the patient's/patient's family's expectations and understanding*	● Monitors and controls tone, non-verbal responses, and language to encourage dialogue ● Accurately communicates role in the health care system to patients/families ● Ensures communication is at the appropriate level for a layperson
Level 2 *Establishes a therapeutic relationship in straightforward encounters using active listening and clear language* *Communicates compassionately with the patient/patient's family to clarify expectations and verify understanding of the clinical situation*	● Restates patient perspective when discussing diagnosis and management ● Counsels patient with new onset epilepsy about driving restrictions ● Participates in a family meeting to discuss patient care goals
Level 3 *Establishes a therapeutic relationship in challenging patient encounters* *Communicates medical information in the context of the patient's/patient's family's values, uncertainty and conflict*	● Effectively counsels a patient with opioid use disorder on pain management strategies ● Organizes a family meeting to address caregiver expectations for a stroke patient transition to home; reassesses patient and family understanding and anxiety
Level 4 *Easily establishes therapeutic relationships, with attention to the patient's/patient's family's concerns and context, regardless of complexity* *Uses shared decision making to align the patient's/patient's family's values, goals, and preferences with treatment options*	● Continues to engage family members with disparate goals in the care of a patient with anoxic encephalopathy ● Recommends a plan for a patient with ALS to align patient and family goals for patient to remain at home
Level 5 *Mentors others in situational awareness and critical self-reflection to consistently develop positive therapeutic relationships*	● Leads debriefing after a difficult family meeting ● Leads teaching session on conflict resolution

Role models shared decision making in the context of the patient's/patient's family's values, uncertainty and conflict	● Establishes effective relationships with families after a grievance
Assessment Models or Tools	● Direct observation ● Self-assessment including self-reflection exercises ● Standardized patients ● 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. 2020. ● 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. 2020.

Interpersonal and Communication Skills 2: Barrier and Bias Mitigation **Overall Intent:** To recognize barriers and biases in communication and develop approaches to mitigate them	
Milestones	**Examples**
Level 1 *Identifies common barriers to effective patient care (e.g., language, disability)*	● Demonstrates awareness of interpretation services
Level 2 *Identifies complex barriers to effective patient care (e.g., health literacy, cultural)*	● Demonstrates respect for different cultural practices ● Provides alternate patient education materials for patients with low health literacy
Level 3 *Recognizes personal biases and mitigates barriers to optimize patient care, when prompted*	● Reflects on assumptions about a patient's sexuality or gender identity
Level 4 *Recognizes personal biases and proactively mitigates barriers to optimize patient care*	● Identifies socioeconomic factors for patients labeled as "non-compliant" and adapts regimens to improve accessibility
Level 5 *Mentors others on recognition of bias and mitigation of barriers to optimize patient care*	● Role models self-awareness and reflection around explicit and implicit biases ● Develops programs that mitigate barriers to patient education
Assessment Models or Tools	● Direct observation ● Self-assessment ● Standardized patients ● 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. 2020. ● 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. 2020.

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 a consultation* *Recognizes the role of a neurology consultant* *Uses language that values all members of the health care team*	● Shows respect in health care team communications through words and actions ● Listens to and considers others' points of view, is nonjudgmental and actively engaged
Level 2 *Confirms understanding of consultant recommendations* *Respectfully accepts a consultation request* *Communicates information effectively with all health care team members*	● Verifies rationale for recommendations given ● Accepts all consult requests graciously ● Uses teach-back strategies to confirm understanding
Level 3 *Clearly and concisely formulates a consultation request* *Clearly and concisely responds to a consultation request* *Uses active listening to adapt communication style to fit team needs*	● Clarifies the rationale for ordering a sleep medicine consultation in a patient with a neuromuscular disorder ● Writes recommendations in the chart to clearly communicate rationale and plan ● Uses verbal and written communication strategies to improve understanding during consultations
Level 4 *Coordinates recommendations from different members of the health care team to optimize patient care* *Solicits and communicates feedback to other members of the health care team*	● Reconciles conflicting recommendations from multiple consulting teams ● Respectfully provides end of rotation feedback to other members of the team
Level 5 *Role models and facilitates flexible communication strategies that value input from all health care team members, resolving conflict when needed*	● Organizes and leads a multidisciplinary team meeting to discuss and resolve potentially conflicting points of view on a plan of care
Assessment Models or Tools	● Direct observation ● Medical record (chart) review

	● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● Green M, Parrott T, Crook G. Improving your communication skills. *BMJ.* 2012;344:e357. https://www.bmj.com/content/344/bmj.e357. 2020. ● 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.jointcommissionjournal.com/article/S1553-7250(06)32022-3/fulltext. 2020. ● 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. 2020. ● 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. 2020.

Interpersonal and Communication Skills 4: Communication within Health Care Systems **Overall Intent:** To effectively and appropriately communicate using a variety of methods	
Milestones	**Examples**
Level 1 *Documents accurate and up-to-date patient information* *Communicates in a way that safeguards patient information*	● Performs medication reconciliation ● Protects personal health information when communicating with other members of the health care team
Level 2 *Demonstrates diagnostic reasoning through organized and timely notes* *Communicates through appropriate channels as required by institutional policy*	● Documents in the medical record rationale for obtaining creatine kinase prior to muscle biopsy ● Only communicates patient information through secured methods
Level 3 *Communicates the diagnostic and therapeutic reasoning* *Selects optimal mode of communication based on clinical context*	● Documents in the medical record rationale for an empiric trial of carbidopa/levodopa in a patient with parkinsonism ● Calls patient directly with urgent lab results instead of sending message in the electronic health record (EHR)
Level 4 *Demonstrates concise, organized written and verbal communication, including anticipatory guidance*	● Reviews with patient the written contingency plan of when to call emergency medical services (EMS) after a seizure
Level 5 *Guides departmental or institutional communication policies and procedures*	● Teaches colleagues how to improve discharge summaries and other communications
Assessment Models or Tools	● Direct observation ● Medical record (chart) review ● Multisource feedback ● Simulation
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. 2020.

	● 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.jointcommissionjournal.com/article/S1553-7250(06)32022-3/fulltext. 2020.

To aid programs in transitioning to the new version of the Milestones, the original Milestones 1.0 have been mapped to the new Milestones 2.0. Where the subcompetencies are similar between versions is indicated below. These are not exact matches, but include some of the same elements. 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: History
PC2: Neurologic Exam	PC2: Neurologic Exam
PC3: Management/Treatment	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC4: Movement Disorders	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC5: Neuromuscular Disorders	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC6: Cerebrovascular Disorders	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC7: Cognitive, Behavioral, and Psychiatric Disorders	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC8: Demyelinating Disorders	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting

	PC6: Diagnosis and Management of Neurologic Emergencies
PC9: Epilepsy	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC10: Headache Syndromes	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC11: Neurologic Manifestations of Systemic Disease	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC12: Child Neurology for the Adult Neurologist	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC13: Neuro-Oncology	PC4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting PC5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting PC6: Diagnosis and Management of Neurologic Emergencies
PC14: Psychiatry for the Adult Neurologist	PC12: Psychiatric and Functional Aspects of Neurology
PC15: Neuroimaging	PC8: Interpretation of Neuroimaging
PC16: Electroencephalogram	PC9: Electroencephalogram
PC17: Nerve Conduction Studies/Electromyography	PC10: Nerve Conduction Studies/Electromyogram
PC18: Lumbar Puncture	PC11: Lumbar Puncture
MK1: Localization	MK1: Localization
MK2: Formulation	PC3: Formulation
MK3: Diagnostic Investigation	MK2: Diagnostic Investigation
SBP1: Systems thinking, including cost- and risk-effective practice	SBP1: Patient Safety SBP2: Quality Improvement SBP4: Physician Role in Health Care Systems

SBP2: Work in inter-professional teams to enhance patient safety	SBP1: Patient Safety SBP2: 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: Well-Being
ICS1: Relationship development, teamwork, and managing conflict	ICS1: Patient and Family-Centered Communication ICS2: Barrier and Bias Mitigation ICS3: Interprofessional and Team Communication
ICS2: Information sharing, gathering, and technology	SBP3: System Navigation for Patient-Centered Care ICS4: Communication within Health Care Systems

Available Milestones Resources

Clinical Competency Committee Guidebook, updated 2020 - https://www.acgme.org/Portals/0/ACGMEClinicalCompetencyCommitteeGuidebook.pdf?ver=2020-04-16-121941-380

Clinical Competency Committee Guidebook Executive Summaries, New 2020 - https://www.acgme.org/What-We-Do/Accreditation/Milestones/Resources - Guidebooks - Clinical Competency Committee Guidebook Executive Summaries

Milestones Guidebook, updated 2020 - https://www.acgme.org/Portals/0/MilestonesGuidebook.pdf?ver=2020-06-11-100958-330

Milestones Guidebook for Residents and Fellows, updated 2020 - https://www.acgme.org/Portals/0/PDFs/Milestones/MilestonesGuidebookforResidentsFellows.pdf?ver=2020-05-08-150234-750

Milestones for Residents and Fellows PowerPoint, new 2020 -https://www.acgme.org/Residents-and-Fellows/The-ACGME-for-Residents-and-Fellows

Milestones for Residents and Fellows Flyer, new 2020 https://www.acgme.org/Portals/0/PDFs/Milestones/ResidentFlyer.pdf

Implementation Guidebook, new 2020 - https://www.acgme.org/Portals/0/Milestones%20Implementation%202020.pdf?ver=2020-05-20-152402-013

Assessment Guidebook, new 2020 - https://www.acgme.org/Portals/0/PDFs/Milestones/Guidebooks/AssessmentGuidebook.pdf?ver=2020-11-18-155141-527

Milestones National Report, updated each Fall - https://www.acgme.org/Portals/0/PDFs/Milestones/2019MilestonesNationalReportFinal.pdf?ver=2019-09-30-110837-587 (2019)

Milestones Bibliography, updated twice each year - https://www.acgme.org/Portals/0/PDFs/Milestones/MilestonesBibliography.pdf?ver=2020-08-19-153536-447

Developing Faculty Competencies in Assessment courses - https://www.acgme.org/Meetings-and-Educational-Activities/Other-Educational-Activities/Courses-and-Workshops/Developing-Faculty-Competencies-in-Assessment

Assessment Tool: Direct Observation of Clinical Care (DOCC) - https://dl.acgme.org/pages/assessment

Assessment Tool: Teamwork Effectiveness Assessment Module **(TEAM) -** https://dl.acgme.org/pages/assessment

Learn at ACGME has several courses on Assessment and Milestones - https://dl.acgme.org/