

# **Neurology Milestones**

The Accreditation Council for Graduate Medical Education



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## **Neurology Milestones**

The Milestones are designed only for use in evaluation of residents in the context of their participation in ACGME-accredited residency programs. The Milestones provide a framework for the assessment of the development of the resident in key dimensions of the elements of physician competency in a specialty or subspecialty. They neither represent the entirety of the dimensions of the six domains of physician competency, nor are they designed to be relevant in any other context.

#### **Neurology Milestones**

### Work Group

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American Board of Psychiatry and Neurology American Osteopathic Board of Neurology and Psychiatry Consortium of Neurology Program Directors Review Committee for Neurology

#### **Understanding Milestone Levels and Reporting**

This document presents the Milestones, which programs use in a semi-annual review of resident performance, and then report to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME Competencies organized in a developmental framework. The narrative descriptions are targets for resident performance throughout their educational program.

Milestones are arranged into levels. Tracking from Level 1 to Level 5 is synonymous with moving from novice to expert resident in the specialty or subspecialty. For each reporting period, the Clinical Competency Committee will review the completed evaluations to select the milestone levels that best describe each learner's current performance, abilities, and attributes for each subcompetency.

These levels *do not* correspond with post-graduate year of education. Depending on previous experience, a junior resident may achieve higher levels early in his/her educational program just as a senior resident may be at a lower level later in his/her educational program. There is no predetermined timing for a resident to attain any particular level. Residents may also regress in achievement of their milestones. This may happen for many reasons, such as over scoring in a previous review, a disjointed experience in a particular procedure, or a significant act by the resident.

Selection of a level implies the resident substantially demonstrates the milestones in that level, as well as those in lower levels (see the diagram on page vi).

#### **Additional Notes**

Level 4 is designed as a graduation *goal* but *does not* represent a graduation *requirement*. Making decisions about readiness for graduation and unsupervised practice is the purview of the program director. Furthermore, Milestones 2.0 include revisions and changes that preclude using Milestones as a sole assessment in high-stakes decisions (i.e., determination of eligibility for certification or credentialing). Level 5 is designed to represent an expert resident whose achievements in a subcompetency are greater than the expectation. Milestones are primarily designed for formative, developmental purposes to support continuous quality improvement for individual learners, education programs, and the specialty. The ACGME and its partners will continue to evaluate and perform research on the Milestones to assess their impact and value.

Examples are provided for some milestones within this document. Please note: the examples are not the required element or outcome; they are provided as a way to share the intent of the element.

Some milestone descriptions include statements about performing independently. These activities must occur in conformity to ACGME supervision guidelines as described in the Program Requirements, as well as to institutional and program policies. For example, a resident who performs a procedure independently must, at a minimum, be supervised through oversight.

A Supplemental Guide is also available to provide the intent of each subcompetency, examples for each level, assessment methods or tools, and other available resources. The Supplemental Guide, like examples contained within the Milestones, is designed only to assist the program director and Clinical Competency Committee, and is not meant to demonstrate any required element or outcome.

Additional resources are available in the <u>Milestones</u> section of the ACGME website. Follow the links under "What We Do" at <u>www.acgme.org</u>.

The diagram below presents an example set of milestones for one sub-competency in the same format as the ACGME Report Worksheet. For each reporting period, a resident's performance on the milestones for each sub-competency will be indicated by selecting the level of milestones that best describes that resident's performance in relation to those milestones.

Systems-based Practice 1: Patient Safety and Quality Improvement				
Level 2	Level 3	Level 4	Level 5	
Identifies system factors that lead to patient safety events	Participates in analysis of patient safety events (simulated or actual)	Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)	Actively engages teams and processes to modify systems to prevent patient safety events	
Reports patient safety events through institutional reporting systems (simulated or actual)	Participates in disclosure of patient safety events to patients and families (simulated or actual)	Discloses patient safety events to patients and families (simulated or actual)	Role models or mentors others in the disclosure of patient safety events	
Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)	Participates in local quality improvement initiatives	Demonstrates skills required to identify, develop, implement, and analyze a quality improvement project	Designs,, implements, and assesses quality improvement initiatives at the institutional or community level	
Comments: Not Yet Completed Level 1				
Selecting a response box in the middle of a level implies that milestones in that level and in lower levels have been substantially demonstrated.		between levels ind in lower levels hav demonstrated as v		
	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) nse box in the mplies that I level and in lower	Level 2Level 3Identifies system factors that lead to patient safety eventsParticipates in analysis of patient safety events (simulated or actual)Reports patient safety events through institutional reporting systems (simulated or actual)Participates in disclosure of patient safety events to patients and families (simulated or actual)Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)Participates in local quality improvement initiativesnse box in the mplies that clevel and in lowerImage: State st	Level 2Level 3Level 4Identifies system factors that lead to patient safety eventsParticipates in analysis of patient safety events (simulated or actual)Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)Reports patient safety events through institutional reporting systems (simulated or actual)Participates in disclosure of patient safety events to patient safety events to patient safety events to patients and families (simulated or actual)Discloses patient safety events to patients and families (simulated or actual)Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)Participates in local quality improvement initiativesDemonstrates skills required to identify, develop, implement, and analyze a quality improvement projectNot Yet Cnse box in the mplies that t level and in lowerSelecting a respond between levels ind in lower levels have	

Patient Care 1: History					
Level 1	Level 2	Level 3	Level 4	Level 5	
Obtains a basic neurologic history	Obtains a complete and relevant neurologic history	Obtains an organized neurologic history, including collateral information as appropriate	Efficiently obtains an organized hypothesis- driven neurologic history	Serves as a role model in obtaining a hypothesis- driven neurologic history	
Comments: Not Yet Completed Level 1  Not Yet Assessable					

Patient Care 2: Neurologic Exam					
Level 1	Level 2	Level 3	Level 4	Level 5	
Performs some components of a neurologic exam	Performs a standard neurologic exam accurately	Performs a relevant neurologic exam incorporating additional appropriate maneuvers	Performs a hypothesis- driven neurologic exam	Serves as a role model for performing a hypothesis-driven, complete, relevant, and organized neurologic exam	
Comments:			Not Yet C Not Yet A	ompleted Level 1	

Patient Care 3: Formulation					
Level 1	Level 2	Level 3	Level 4	Level 5	
Summarizes history and exam findings	Generates a broad differential diagnosis based on history, exam, and localization	Synthesizes relevant information to focus and prioritize diagnostic possibilities	Continuously reconsiders diagnosis in response to changes in clinical circumstances and available data	Serves as a role model for clinical reasoning by demonstrating sophisticated formulation in complex presentations	
Comments: Not Yet Completed Level 1					

Patient Care 4: Diagnosis and Management of Neurologic Disorders in the Outpatient Setting				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies typical presentations of commonly encountered neurologic conditions	Diagnoses commonly encountered neurologic conditions	Identifies atypical presentations of commonly encountered neurologic conditions	Diagnoses uncommon neurologic conditions	Identifies atypical presentations of uncommon neurologic conditions
	Develops an initial treatment plan for commonly encountered neurologic disorders	Individualizes management and follow- up plan for commonly encountered neurologic disorders, considering risks, benefits, and non- pharmacologic strategies	Adapts management plan based upon patient response and complications of therapy; identifies when to change acuity of care	Longitudinally manages uncommon neurologic conditions
Comments: Not Yet Completed Level 1				

Patient Care 5: Diagnosis and Management of Neurologic Disorders in the Inpatient Setting				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies typical presentations of commonly encountered neurologic conditions	Diagnoses commonly encountered neurologic conditions	Identifies atypical presentations of commonly encountered neurologic conditions	Diagnoses uncommon neurologic conditions	Identifies atypical presentations of uncommon neurologic conditions
	Develops an initial treatment plan for commonly encountered neurologic disorders	Individualizes management plan, ensuring the appropriate level of care throughout hospitalization and upon discharge	Adapts management plan based upon treatment response, disease progression, and complications of therapy	Leads the management of patients with complex and uncommon neurologic conditions
Comments: Not Yet Completed Level 1				

Patient Care 6: Diagnosis and Management of Neurologic Emergencies				
Level 1	Level 2	Level 3	Level 4	Level 5
Describes the typical presentation of neurologic emergencies	Recognizes when a patient's presentation is a neurologic emergency	Diagnoses neurologic emergencies, using appropriate diagnostic testing	Re-appraises diagnostic considerations based on treatment response, disease progression, and complications of therapy	Serves as a role model for management of neurologic emergencies
Seeks assistance and conveys pertinent details during a neurologic emergency	Initiates management for a neurologic emergency	Manages patients with common neurologic emergencies	Manages complex neurologic emergencies	
Comments: Not Yet Completed Level 1				

Patient Care 7: Determination of Death by Neurologic Criteria					
Level 1	Level 2	Level 3	Level 4	Level 5	
Demonstrates knowledge of medical and legal significance of death by neurologic criteria	Lists the components for determining death by neurologic criteria	Describes supplemental testing used to determine death by neurologic criteria	Accurately performs determination of death by neurologic criteria	Educates others in the determination of death by neurologic criteria, including appropriate use of supplemental testing, as well as controversies	
Comments:				ompleted Level 1	

Patient Care 8: Interpretation of Neuroimaging					
Level 1	Level 2	Level 3	Level 4	Level 5	
Identifies basic neuroanatomy on brain and vascular anatomy of the head and neck magnetic resonance (MR) and computed tomography (CT)	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	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	Interprets subtle abnormalities of brain and cerebrovascular system on MR and CT Interprets MR and CT of the spine	Interprets advanced neuroimaging	
Comments: Not Yet Completed Level 1					

Patient Care 9: Electroencephalogram (EEG)					
Level 1	Level 2	Level 3	Level 4	Level 5	
Identifies patients for whom EEG is appropriate	Recognizes normal EEG features, including common artifacts, in children and adults	Recognizes patterns of status epilepticus, normal EEG variants, and common abnormalities in children and adults	Interprets common EEG abnormalities and patterns that could represent status epilepticus	Interprets uncommon EEG abnormalities and creates a report	
Comments:			Not Yet Co Not Yet As	ompleted Level 1	

Patient Care 10: Nerve Conduction Study/Electromyogram (NCS/EMG)					
Level 1	Level 2	Level 3	Level 4	Level 5	
Identifies patients for whom NCS/EMG is appropriate	Identifies NCS/EMG findings for common disorders	Correlates NCS/EMG results to patient presentation, including identification of potential study limitations	Formulates basic NCS/EMG plan and interprets data for common clinical presentations	Performs, interprets, and creates a report for NCS/EMG	
Comments:				ompleted Level 1	

Patient Care 11: Lumbar Puncture					
Level 1	Level 2	Level 3	Level 4	Level 5	
Lists the indications, contraindications, and complications for lumbar puncture	Performs lumbar puncture under direct supervision	Performs lumbar puncture without direct supervision and manages complications	Performs lumbar puncture on patients with challenging anatomy	Performs lumbar puncture using image guidance	
Comments:			Not Yet C Not Yet A	ompleted Level 1	

Patient Care 12: Psychiatric and Functional Aspects of Neurology					
Level 1	Level 2	Level 3	Level 4	Level 5	
Recognizes contributions of common psychiatric disorders and their treatment to neurologic diseases	Develops a treatment plan that considers psychiatric comorbidities and side effects of psychiatric medications	Accurately differentiates psychiatric or functional contributions to neurologic symptoms	Leads a discussion with a patient and/or caregiver that explains the psychiatric or functional contribution to the patient's neurologic symptoms	Develops a shared management plan that addresses the psychiatric or functional contribution to neurologic symptoms	
Comments:			Not Yet C Not Yet A	ompleted Level 1	

Medical Knowledge 1: Localization					
Level 1	Level 2	Level 3	Level 4	Level 5	
Recognizes the role of localization in neurologic diagnosis	Localizes lesions to general regions of the nervous system	Localizes lesions to specific regions of the nervous system	Localizes lesions to discrete structures of the nervous system	Consistently demonstrates sophisticated and detailed knowledge of neuroanatomy in localizing lesions	
Comments:				ompleted Level 1	

Medical Knowledge 2: Diagnostic Investigation					
Level 1	Level 2	Level 3	Level 4	Level 5	
Discusses a general diagnostic approach appropriate to clinical presentation	Lists indications, contraindications, risks, and benefits of diagnostic testing	Prioritizes and interprets diagnostic tests appropriate to clinical urgency and complexity	Uses complex diagnostic approaches in uncommon situations	Demonstrates sophisticated knowledge of diagnostic testing and controversies	
Comments:	Comments: Not Yet Completed Level 1				

Systems-Based Practice 1: Patient Safety				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of commonly reported patient safety events	Identifies system factors that lead to patient safety events	Participates in analysis of patient safety events	Conducts analysis of patient safety events and offers error prevention strategies	Actively engages teams and processes to modify systems to prevent patient safety events
Demonstrates knowledge of how to report patient safety events	Reports patient safety events through institutional reporting systems	Participates in disclosure of patient safety events to patients and patients' families	Discloses patient safety events to patients and patients' families	Role models or mentors others in the disclosure of patient safety events
Comments:				

Systems-Based Practice 2: Quality Improvement				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of basic quality improvement methodologies and metrics	Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)	Participates in local quality improvement initiatives	Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project	Creates, implements, and assesses quality improvement initiatives at the institutional or community level
Comments:			Not Yet C	ompleted Level 1

Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of care coordination	Coordinates care of patients in routine clinical situations effectively using the roles of the interprofessional team members	Coordinates care of patients in complex clinical situations effectively using the roles of the interprofessional team members	Role models effective coordination of patient- centered care among different disciplines and specialties	Improves quality of transitions of care within and across health care delivery systems to
Performs safe and effective transitions of care/hand-offs in routine clinical situations	Performs safe and effective transitions of care/hand-offs in complex clinical situations	Supervises transitions of care by other team members	Role models safe and effective transitions of care/hand-offs within and across health care delivery systems, including outpatient settings	optimize patient outcomes
Demonstrates knowledge of population and community health needs and disparities	Identifies specific population and community health needs and inequities for the local population and community	Effectively uses local resources to meet the needs of a patient population and community	Adapts practice to provide for the needs of specific populations	Leads innovations in adapting practice and systems for populations and communities with health care disparities

Systems-Based Practice 4: Physician Role in Health Care Systems				
Level 1	Level 2	Level 3	Level 4	Level 5
Describes basic health care payment systems, (e.g., government, private, public, uninsured care) and practice models	Delivers patient-centered care, considering the patient's economic constraints	Engages with patients in shared decision making, informed by each patient's payment models	Uses available resources to promote optimal patient care (e.g., community resources, patient assistance resources) considering each patient's payment model	Advocates for systems change that enhances high-value, efficient, and effective patient care
Identifies basic knowledge domains for effective transition to practice (e.g., information technology, legal, billing and coding, financial, personnel)	Demonstrates use of information technology required for medical practice (e.g., electronic health record, documentation required for billing and coding)	Consistently demonstrates timely and accurate documentation, including coding and billing requirements	Implements changes in individual practice patterns in response to professional requirements and in preparation for practice	Educates others to prepare them for transition to practice
Comments: Not Yet Completed Level 1				

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates how to access and use available evidence, and to incorporate patient preferences and values to care for a routine patient	Articulates clinical questions and elicits patient preferences and values to guide evidence- based care	Locates and applies the best available evidence, integrated with patient preference, to the care of complex patients	Critically appraises and applies evidence, even in the face of uncertainty, and interprets conflicting evidence to guide care, tailored to the individual patient	Coaches others to critically appraise and apply evidence for complex patients, and/or participates in the development of guidelines
Comments: Not Yet Completed Level 1				

Level 1	Level 2	Level 3	Level 4	Level 5
Accepts responsibility for personal and professional development by establishing goals	Demonstrates openness to performance data (feedback and other input) to inform goals	Seeks performance data sporadically, with adaptability and humility	Seeks performance data consistently	Role models seeking performance data, with adaptability and humility
Identifies the factors that contribute to gap(s) between expectations and actual performance	Analyzes and reflects on the factors that contribute to gap(s) between expectations and actual performance	Institutes behavioral change(s) to narrow the gap(s) between expectations and actual performance	Challenges assumptions and considers alternatives in narrowing the gap(s) between expectations and actual performance	Coaches others on reflective practice
Actively seeks opportunities to improve	Designs and implements a learning plan, with prompting	Independently creates and implements a learning plan	Uses performance data to measure the effectiveness of the learning plan, and, when necessary, improves it	Facilitates the design and implementation of learning plans for others

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies and describes potential triggers for professionalism lapses and how to report	Demonstrates insight into professional behavior in routine situations and takes responsibility	Demonstrates professional behavior in complex or stressful situations	Intervenes to prevent professionalism lapses in oneself and others	Coaches others when their behavior fails to meet professional expectations
Demonstrates knowledge of ethical principles related to patient care	Analyzes straightforward situations using ethical principles	Analyzes complex situations using ethical principles	Recognizes and uses appropriate resources for managing and resolving ethical dilemmas as needed	Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution

Professionalism 2: Accountability/Conscientiousness				
Level 1	Level 2	Level 3	Level 4	Level 5
Takes responsibility for failure to complete tasks and responsibilities, identifies potential contributing factors, and describes strategies for ensuring timely task completion in the future	Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations	Performs tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations	Recognizes situations in which one's own behavior may impact others' ability to complete tasks and responsibilities in a timely manner	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
Responds promptly to requests or reminders to complete tasks and responsibilities	Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner	Proactively implements strategies to ensure that the needs of patients, teams, and systems are met		
Comments: Not Yet Completed Level 1				

Professionalism 3: Well-Being				
Level 1	Level 2	Level 3	Level 4	Level 5
Recognizes sense of personal and professional well-being, with assistance	Independently recognizes status of personal and professional well-being	With assistance, proposes a plan to optimize personal and professional well-being	Independently develops a plan to optimize personal and professional well-being	Coaches others when emotional responses or limitations in knowledge/ skills do not meet professional expectations
Comments: Not Yet Completed Level 1				

factors that affect well-being, the mechanisms by which those factors affect well-being, and available resources and tools to improve well-being.

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Uses language and non- verbal behavior to demonstrate respect and establish rapport	Establishes a therapeutic relationship in straightforward encounters using active listening and clear language	Establishes a therapeutic relationship in challenging patient encounters	Easily establishes therapeutic relationships, with attention to the patient's/patient's family's concerns and context, regardless of complexity	Mentors others in situational awareness and critical self-reflection to consistently develop positive therapeutic relationships
Identifies the need to individualize communication strategies based on the patient's/patient's family's expectations and understanding	Communicates compassionately with the patient/patient's family to clarify expectations and verify understanding of the clinical situation	Communicates medical information in the context of the patient's/patient's family's values, uncertainty and conflict	Uses shared decision making to align the patient's/patient's family's values, goals, and preferences with treatment options	Role models shared decision making in the context of the patient's/patient's family's values, uncertainty and conflict
Comments: Not Yet Completed Level 1				

Interpersonal and Communication Skills 2: Barrier and Bias Mitigation					
Level 1	Level 2	Level 3	Level 4	Level 5	
Identifies common barriers to effective patient care (e.g., language, disability)	Identifies complex barriers to effective patient care (e.g., health literacy, cultural)	Recognizes personal biases and mitigates barriers to optimize patient care, when prompted	Recognizes personal biases and proactively mitigates barriers to optimize patient care	Mentors others on recognition of bias and mitigation of barriers to optimize patient care	
Comments: Not Yet Completed Level 1					

Interpersonal and Communication Skills 3: Interprofessional and Team Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Respectfully requests a consultation	Confirms understanding of consultant recommendations	Clearly and concisely formulates a consultation request	Coordinates recommendations from different members of the health care team to optimize patient care	Role models and facilitates flexible communication strategies that value input from all health care team
Recognizes the role of a neurology consultant	Respectfully accepts a consultation request	Clearly and concisely responds to a consultation request		members, resolving conflict when needed
Uses language that values all members of	Communicates information effectively	Uses active listening to adapt communication	Solicits and communicates feedback	
the health care team	with all health care team members	style to fit team needs	to other members of the health care team	
Comments: Not Yet Completed Level 1				

Interpersonal and Comm	unication Skills 4: Commu	nication within Health Care	e Systems	
Level 1	Level 2	Level 3	Level 4	Level 5
Documents accurate and up-to-date patient information	Demonstrates diagnostic reasoning through organized and timely notes	Communicates the diagnostic and therapeutic reasoning	Demonstrates concise, organized written and verbal communication, including anticipatory guidance	Guides departmental or institutional communication policies and procedures
Communicates in a way that safeguards patient information	Communicates through appropriate channels as required by institutional policy	Selects optimal mode of communication based on clinical context		
Comments: Not Yet Completed Level 1				