## Child Neurology Milestones



ACGME International, Inc. (ACGME-I)



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## **Child Neurology Milestones**

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

## **Understanding Milestone Levels and Reporting**

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

Milestones are arranged into levels. Tracking from Level 1 to Level 5 is synonymous with moving from novice to expert resident or fellow 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, more junior residents/fellows may achieve higher levels early in their educational program just as more senior residents/fellows may be at a lower level later in their educational program. There is no predetermined timing for a resident or fellow to attain any particular level. Residents and fellows 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/fellow.

Selection of a level implies the resident/fellow 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 the Milestones as a sole assessment in high-stakes decisions. Level 5 is designed to represent an expert resident or fellow 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. ACGME-I 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. 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 conformance with ACGME-I supervision guidelines as described in the applicable Program Requirements, as well as with 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 more context regarding the intent of each subcompetency, as well as examples for each level, assessment methods or tools, and other resources. The Supplemental Guide, like examples contained within the Milestones, is designed only to assist the program director and Clinical Competency Committee; it is not meant to demonstrate any required element or outcome.

The diagram below presents an example set of milestones for one subcompetency in the same format as the ACGME-I Report Worksheet. For each reporting period, a resident's/fellow's performance on the milestones within each subcompetency will be indicated by selecting the Milestones Level that best describes that individual's performance in relation to those milestones.

Systems-Based Practice 1: Patient Safety and Quality Improvement				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of common patient safety events	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
Demonstrates knowledge of how to report patient safety events	Reports patient safety events through institutional reporting systems (simulated or actual)	Participates in disclosure of patient safety events to patients and their families (simulated or actual)	Discloses patient safety events to patients and their families (simulated or actual)	Role models or mentors others in the disclosure of patient safety events
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 Completed Level 1				Completed Level 1
Selecting a resp middle of a level milestones in tha levels have been demonstrated.	implies that at level and in lower	Selecting a response between levels indica in lower levels have be demonstrated as well milestones in the high	tes that milestones een substantially as <b>some</b>	

Patient Care 1: Neurologic and Developmental History				
Level 1	Level 2	Level 3	Level 4	Level 5
Obtains, communicates, and documents a developmentally appropriate history, including perinatal, developmental, and family components	Obtains, communicates, and documents a complete and relevant history	Obtains, communicates, and documents a well- organized history	Obtains, communicates, and documents history efficiently	Reconciles information from conflicting sources or that are difficult to access into the history
Comments:	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, communicates, and documents a systematic, developmentally appropriate neurological exam on patients ranging across the lifespan	Performs, communicates, and documents an accurate neurological exam on patients ranging across the lifespan	Performs, communicates, and documents a comprehensive and relevant neurological exam, incorporating some additional appropriate maneuvers	Efficiently performs, communicates, and documents a precise neurological exam pertinent to the patient's presenting problem	Consistently demonstrates mastery in performing, communicating, and documenting a neurological exam on patients ranging across the lifespan
Comments:  Not Yet Completed Level 1  Not Yet Assessable				

Patient Care 3: Critical Care				
Level 1	Level 2	Level 3	Level 4	Level 5
Recognizes critical illnesses and emergencies that affect the nervous system	Diagnoses critical illnesses and emergencies that affect the nervous system	Manages critical illnesses and emergencies that affect the nervous system, with direct supervision	Independently diagnoses and manages critical illnesses and emergencies that affect the nervous system	Serves as a model for the management of critical illnesses and emergencies that affect the nervous system and is an integral part of the interdisciplinary team
Comments:			Not Yet Co Not Yet As	ompleted Level 1 ssessable

Patient Care 4: Diagnosis and Management in the Inpatient Setting				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies typical presentations of common neurologic conditions	Diagnoses common neurologic conditions	Identifies atypical presentations of common neurologic conditions and typical presentations of uncommon neurologic conditions	Diagnoses uncommon neurologic conditions	Identifies atypical presentations of uncommon neurologic conditions
Develops an initial management plan for common neurologic disorders	Manages common neurologic disorders, considering risks and benefits of treatment	Individualizes management, ensuring the appropriate level of care throughout hospitalization and upon discharge	Manages treatment response, disease progression, and complications of therapy	Serves as a model for inpatient management of neurologic conditions and leads the interdisciplinary team
Comments:  Not Yet Completed Level 1  Not Yet Assessable				

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies typical presentations of common neurologic conditions	Diagnoses common neurologic conditions	Diagnoses atypical variants of common neurologic conditions	Diagnoses uncommon neurologic conditions	Identifies atypical presentations of uncommon neurologic conditions
Develops an initial management plan for common neurologic disorders	Manages common neurologic disorders, considering risks and benefits of treatment	Individualizes management and adapts plan based upon patient response and family factors	Manages disease progression and complications of therapy; identifies when to change acuity of care	Longitudinally and independently manages patients with complex neurologic conditions

Patient Care 6: Neuroimaging				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies normal neuroanatomy on brain and spine magnetic resonance (MR) and computed tomography (CT)	Describes major abnormalities of the brain and spine on MR and CT	Describes subtle abnormalities of the brain and spine and normal developmental changes on MR and CT	Interprets developmental and acquired abnormalities on neuroimaging of brain and spine	Interprets rare and complex findings on neuroimaging and serves as a resource for colleagues
Comments:  Not Yet Completed Level 1				
			Not Yet As	ssessable

Patient Care 7: Electroencephalogram (EEG)				
Level 1	Level 2	Level 3	Level 4	Level 5
Describes general indications for an EEG	Describes normal EEG features using correct terminology, including common artifacts, across the lifespan	Describes patterns of status epilepticus, normal EEG variants, and common abnormalities, across the lifespan	Interprets common EEG abnormalities and creates a report	Interprets uncommon EEG abnormalities
Comments:				Completed Level 1

Patient Care 8: Lumbar Puncture					
Level 1	Level 2	Level 3	Level 4	Level 5	
Lists the indications, contraindications, and complications of lumbar puncture	Performs lumbar puncture and manages complications from lumbar puncture under direct supervision	Performs lumbar puncture with indirect supervision	Independently performs lumbar puncture on patients across the lifespan	Administers intrathecal therapies	
Comments:				Completed Level 1	

Patient Care 9: Electromyography				
Level 1	Level 2	Level 3	Level 4	Level 5
Describes general indications for nerve conduction studies/ electromyography tests	Describes patterns seen on nerve conduction studies/ electromyography related to localization	Plans nerve conductive studies/ electromyography in the context of the clinical presentation	Interprets results of nerve conductive studies/ electromyography testing in the context of the clinical presentation	Plans, performs, interprets, and creates a report for nerve conductive studies/ electromyography
Comments:  Not Yet Completed Level 1  Not Yet Assessable				

Patient Care 10: Determination of Death by Neurologic Criteria				
Level 1	Level 2	Level 3	Level 4	Level 5
Discusses the concept of determination of death by neurologic criteria	Identifies components of determination of death by neurologic criteria	Performs determination of death by neurologic criteria, with assistance	Independently performs determination of death by neurologic criteria	Serves as a role model for determination of death by neurologic criteria
Comments:				Completed Level 1

Medical Knowledge 1: Development and Behavior				
Level 1	Level 2	Level 3	Level 4	Level 5
Lists growth and developmental norms	Identifies signs of abnormal growth and development	Demonstrates sufficient knowledge to counsel families regarding outliers in normal growth and development	Demonstrates sufficient knowledge to counsel families regarding common and uncommon disorders of	Serves as a role model to counsel families regarding uncommon disorders of development across the lifespan
Recognizes that emotional, cognitive, and behavioral developments evolve across the lifespan	Discusses normal emotional, cognitive, and behavioral development across the lifespan	Discusses abnormal emotional, cognitive, and behavioral development across the lifespan	development across the lifespan	·
Comments:				Completed Level 1

Medical Knowledge 2: Localization				
Level 1	Level 2	Level 3	Level 4	Level 5
Localizes signs and symptoms to general regions of the nervous system	Localizes signs and symptoms to specific regions of the nervous system	Localizes signs and symptoms to discrete structures of the nervous system	Precisely localizes signs and symptoms and describes the impact on patient management	Role models the precise localization of complex signs and symptoms to discrete structures of the nervous system
Comments:			Not Yet Co Not Yet As	ompleted Level 1

Medical Knowledge 3: Clinical Reasoning and Formulation					
Level 1	Level 2	Level 3	Level 4	Level 5	
Synthesizes available information to create age-appropriate broad differential diagnosis	Identifies relevant pathophysiologic categories to generate a structured differential diagnosis	Accurately prioritizes differential diagnosis	Continuously re- evaluates differential diagnosis in response to changes in clinical circumstances	Role models formulation and clinical reasoning	
Comments:			Not Yet Co Not Yet As	ompleted Level 1 ssessable	

Medical Knowledge 4: Diagnostic Investigation					
Level 1	Level 2	Level 3	Level 4	Level 5	
Discusses 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 that have the highest diagnostic yield and cost effectiveness	Demonstrates sophisticated knowledge of diagnostic testing and controversies	
Comments:				Assessable	

Systems-Based Practice	e 1: Patient Safety and Qual	ity Improvement		
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of common patient safety events	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
Demonstrates knowledge of how to report patient safety events	Reports patient safety events through institutional reporting systems (simulated or actual)	Participates in disclosure of patient safety events to patients and their families (simulated or actual)	Discloses patient safety events to patients and their families (simulated or actual)	Role models or mentors others in the disclosure of patient safety events
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 Completed Level 1				

Systems-Based Practice 2: System Navigation for Patient-Centered Care				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of care coordination	Coordinates care of patients in routine clinical situations, effectively utilizing the roles of the interprofessional teams	Coordinates care of patients in complex clinical situations, effectively utilizing the roles of the interprofessional teams	Role models effective coordination of patient- centered care among different disciplines and specialties	Analyzes the process of care coordination and leads in the design and implementation of improvements
Identifies key elements for safe and effective transitions of care and hand-offs	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	Role models and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems, including outpatient settings	Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes
Comments:  Not Yet Completed Level 1				

Systems-Based Practice 3: Physician Role in Health Care Systems				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies key components of the complex health care system (e.g., hospital, skilled nursing facility, finance, personnel, technology)	Describes how components of a complex health care system are interrelated, and how this impacts patient care	Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)	Manages various components of the complex health care system to provide efficient and effective patient care and transition of care	Advocates for or leads systems change that enhances high value, efficient, and effective patient care and transition of care
Describes the principles of cost-effective care	Delivers care with consideration of each patient's payment model	Engages with patients in shared decision making, informed by cost-effective care principles	Advocates for patient care needs (e.g., community resources, patient assistance resources) regardless of ability to pay	Participates in health policy advocacy activities
Comments:  Not Yet Completed Level 1				

Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates how to access and use available evidence, and incorporate patient preferences and values in order to take care of a routine patient	Articulates clinical questions and elicits patient preferences and values in order 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 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

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) in order to inform goals	Seeks performance data episodically, with adaptability and humility	Intentionally seeks performance data consistently, with adaptability and humility	Role models consistently seeking performance data with adaptability and humility
Identifies the factors which contribute to gap(s) between expectations and actual performance	Analyzes and reflects on the factors which contribute to gap(s) between expectations and actual performance	Analyzes, reflects on, and 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	Demonstrates insight into professional behavior in routine situations	Demonstrates professional behavior in complex or stressful situations	Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in self and others	Coaches others when their behavior fails to meet professional expectations
Describes when and how to appropriately report professionalism lapses, including strategies for addressing common barriers	Takes responsibility for own professionalism lapses	Recognizes need to seek help in managing and resolving complex ethical situations	Recognizes and utilizes appropriate resources for managing and resolving ethical dilemmas as needed (e.g., ethics consultations, literature	Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their
Demonstrates knowledge of the ethical principles underlying informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related	Analyzes straightforward situations using ethical principles	Analyzes complex situations using ethical principles	review, risk management/legal consultation)	resolution
topics				

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 that may impact others' ability to complete tasks and responsibilities in a timely manner	Takes ownership of system outcomes
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: Self-Awareness and Help-Seeking				
Level 1	Level 2	Level 3	Level 4	Level 5
Recognizes status 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
Recognizes limits in the knowledge/skills of self or team, with assistance	Independently recognizes limits in the knowledge/ skills of self or team and demonstrates appropriate help-seeking behaviors	With assistance, proposes a plan to remediate or improve limits in the knowledge/skills of self or team	Independently develops a plan to remediate or improve limits in the knowledge/skills of self or team	
Comments:  Not Yet Completed Level 1				

Interpersonal and Communication Skills 1: Patient and Family-Centered Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Uses language and nonverbal 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 patient/ family concerns and context, regardless of complexity	Mentors others in situational awareness and critical self-reflection to consistently develop positive therapeutic relationships
Identifies common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system	Identifies complex barriers to effective communication (e.g., health literacy, cultural)	When prompted, reflects on personal biases while attempting to minimize communication barriers	Independently recognizes personal biases while attempting to proactively minimize communication barriers	Role models self- awareness while identifying a contextual approach to minimize communication barriers
Identifies the need to adjust communication strategies based on assessment of patient/ family expectations and understanding of their health status and treatment options	Organizes and initiates communication with patient/family by introducing stakeholders, setting the agenda, clarifying expectations, and verifying understanding of the clinical situation	With guidance, sensitively and compassionately delivers medical information, elicits patient/ family values, goals, and preferences, and acknowledges uncertainty and conflict	Independently, uses shared decision making to align patient/family values, goals, and preferences with treatment options to make a personalized care plan	Role models shared decision making in patient/family communication, including those with a high degree of uncertainty/conflict
Comments:	Comments:  Not Yet Completed Level 1			

Interpersonal and Communication Skills 2: Patient and Family Education						
Level 1	Level 2	Level 3	Level 4	Level 5		
Recognizes link between patient outcomes and education	Describes methods for effective patient education	Educates patients effectively in straightforward situations, including eliciting understanding of information provided	Educates patients effectively in complex situations	Educates patients in self- advocacy, community outreach, and activism		
Identifies the need to adjust communication strategies based on patient/family expectations and understanding of their health status and treatment options	Organizes and initiates communication with patient/family by introducing stakeholders, setting the agenda, clarifying expectations, and verifying understanding of the clinical situation	Compassionately delivers medical information, elicits patient/family values, goals and preferences, and acknowledges uncertainty and conflict	Independently uses shared decision making to align patient/family values, goals, and preferences with treatment options to make a personalized care plan	Role models shared decision making in patient/family communication, including those with a high degree of uncertainty/conflict		
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	Clearly and concisely requests a consultation	Checks own understanding of consultant recommendations	Coordinates recommendations from different members of the health care team to optimize patient care	Role models flexible communication strategies that value input from all health care team members, resolving conflict when needed		
Respectfully receives a consultation request	Clearly and concisely responds to a consultation request	Checks understanding of recommendations when providing consultation				
Uses language that values all members of the health care team	Communicates information effectively with all health care team members	Uses active listening to adapt communication style to fit team needs				
	Solicits feedback on performance as a member of the health care team	Communicates concerns and provides feedback to peers and learners	Communicates feedback and constructive criticism to superiors	Facilitates regular health care team-based feedback in complex situations		
Comments:  Not Yet Completed Level 1						

Level 1	Level 2	Level 3	Level 4	Level 5
Accurately records information in the patient record	Demonstrates organized diagnostic and therapeutic reasoning through notes in the patient record	Concisely reports diagnostic and therapeutic reasoning in the patient record	Communicates clearly, concisely, timely, and in an organized written form, including anticipatory guidance	Models feedback to improve others' written communication
Safeguards patient personal health information	Demonstrates accurate, timely, and appropriate use of documentation shortcuts  Documents required data in formats specified by institutional policy	Appropriately selects direct (e.g., telephone, inperson) and indirect (e.g., progress notes, text messages) forms of communication based on context	Achieves written or verbal communication (e.g., patient notes, email) that serves as an example for others to follow	Guides departmental or institutional communication around policies and procedures
Communicates through appropriate channels as required by institutional policy (e.g., patient safety reports, cell phone/pager usage)	Respectfully communicates concerns about the system	Uses appropriate channels to offer clear and constructive suggestions to improve the system	Initiates difficult conversations with appropriate stakeholders to improve the system	Facilitates dialogue regarding systems issues among larger community stakeholders (institution, health care system, field)