# Child Neurology Milestones



The Accreditation Council for Graduate Medical Education



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## Child Neurology Milestones

The Milestones are designed only for use in evaluation of resident 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.

### **Child Neurology Milestones**

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American Board of Psychiatry and Neurology
Professors of Child Neurology
Review Committee for Child 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 v).

#### **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 subcompetency in the same format as the ACGME Report Worksheet. For each reporting period, a resident's performance on the milestones for each subcompetency will be indicated by selecting the level of milestones that best describes that resident's performance in relation to those milestones.

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 (actual or simulated)	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
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				
Selecting a respon middle of a level im	plies that			nse box on the line indicates that mileston
milestones in that level and in lower levels have been substantially demonstrated.			in lower levels ha demonstrated as milestones in the	

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:  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 Completed Level 1  Not Yet Assessable				

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 neurological conditions and leads the interdisciplinary team
Comments:  Not Yet Completed Level 1  Not Yet Assessable				

Patient Care 5: Diagnos	sis and Management in the	e Outpatient Setting		
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
Comments:  Not Yet Completed Level 1  Not Yet Assessable				

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 Assessable				

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:  Not Yet Completed Level 1  Not Yet Assessable					

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 development across the	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	lifespan	
Comments:				Completed Level 1

Medical Knowledge 2: Lo	ocalization			
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 ssessable

Medical Knowledge 3: C	linical Reasoning and Form	nulation		
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: D	iagnostic 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 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
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:	Comments:  Not Yet Completed 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 teams	Coordinates care of patients in complex clinical situations effectively using the roles of their 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
Demonstrates knowledge of population and community health needs and disparities	Identifies specific population and community health needs and inequities for their local population	Uses local resources effectively to meet the needs of a patient population and community	Participates in changing and adapting practice to provide for the needs of specific populations	Leads innovations and advocates for populations and communities with health care inequities

Level 1	Level 2	Level 3	Level 4	Level 5
dentifies key components of the complex health care system (e.g., hospital, skilled nursing facility, inance, 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 basic health payment systems (e.g., government, private, bublic, uninsured care) and practice models	Delivers care with consideration of each patient's payment model (e.g., insurance type)	Engages with patients in shared decision making, informed by each patient's payment models	Advocates for patient care needs (e.g., community resources, patient assistance resources) with consideration of the limitations of each patient's payment model	Participates in health policy advocacy activities
dentifies basic knowledge domains for effective transition to practice	Describes core administrative knowledge needed for transition to practice	Demonstrates use of administrative knowledge required for transition to practice	Analyzes individual practice patterns and professional requirements for transition to practice	Educates others to prepare them for transition to practice

Practice-Based Learning	and Improvement 1: Evide	ence-Based and Informed P	Practice	
Level 1	Level 2	Level 3	Level 4	Level 5
Uses available evidence to care for a routine patient	Articulates clinical questions to guide evidence-based care	Locates and applies the best available evidence to the care of complex patients	Critically appraises and applies evidence even in the face of uncertainty and conflicting evidence to guide care	Coaches others to critically appraise and apply evidence for complex patients; and/or participates in the development of guidelines
Comments:			Not Yet C	ompleted Level 1

emonstrates openness performance data eedback and other out)	Seeks performance data episodically, with	Intentionally seeks	Role models consistently
Suty	adaptability and humility	performance data consistently with adaptability and humility	seeking performance data with adaptability and humility
nalyzes and reflects on e factors which ontribute to gap(s) etween expectations and ctual performance	Analyzes, reflects on, and institutes behavioral change(s) to narrow the gap(s) between expectations and actual performance	Addresses assumptions and considers alternatives in narrowing the gap(s) between expectations and actual performance	Coaches others on reflective practice
esigns and implements learning plan, with ompting	Independently creates and implements a learning plan	Analyze and edit/modify learning plans regularly	Role models creation, implementation, analysis, and modification of learning plans
e et et et	e factors which ntribute to gap(s) tween expectations and tual performance esigns and implements earning plan, with	institutes behavioral change(s) to narrow the gap(s) between expectations and tual performance expectations and actual performance.  Independently creates and implements a	institutes behavioral change(s) to narrow the gap(s) between expectations and tual performance esigns and implements earning plan, with institutes behavioral change(s) to narrow the gap(s) between narrowing the gap(s) between expectations and actual performance and actual performance Analyze and edit/modify learning plans regularly

Professionalism 1: Profe	essional Behavior and Ethic	al Principles		
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies and describes potential triggers for professionalism lapses and describes when and how to appropriately report professionalism lapses, including strategies for addressing common barriers	Demonstrates professional behavior in routine situations and takes responsibility for own professionalism lapses	Demonstrates professional behavior in complex or stressful situations	Recognizes situations that may trigger professionalism lapses and/or intervenes to prevent lapses in self and others	Coaches others when their behavior fails to meet professional expectations
Demonstrates knowledge of fundamental ethical principles	Analyzes straightforward situations using ethical principles and recognizes need to seek help in managing and resolving complex ethical situations	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
Comments:			Not Yet C	completed Level 1

Professionalism 2: Acco	untability/Conscientiousne	ess			
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	Manages situations that may impact others' ability to complete tasks and responsibilities in a timely manner	Identifies and seeks to address system-level factors that impact completion of tasks	
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	Role models the strategies to ensure that the needs of patients, teams, and systems are met	Coaches others to develop strategies to ensure that the needs of patients, teams, and systems are met	
Comments:					

Professionalism 3: Self-A	Awareness and Well-Being				
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 promote personal and professional well-being	Independently develops a plan to promote personal and professional well-being	Coaches others when emotional responses or limitations in knowledge/ skills do not meet professional expectations	
Recognizes limits in knowledge/skills, with assistance	Independently recognizes limits in knowledge/skills	With assistance, proposes a plan to remediate or improve limits in knowledge/skills	Independently develops a plan to remediate or improve limits in knowledge/skills		
Comments:			Not Yet C	ompleted Level 1	

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 while accurately communicating own role within the health care system	Identifies complex barriers to effective communication	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 practice while identifying teaching a contextual approach to minimize communication barriers

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

Level 1	Level 2	Level 3	Level 4	Level 5
Respectfully requests and/or receives a consultation	Clearly and concisely requests or responds to a consultation	Checks own or others understanding of consultation	Coordinates recommendations from different members of the health care team to	Role models flexible communication strategies that value input from all health care team
Uses language that values all members of the health care team	Communicates information effectively with all members of the health care team	Uses active listening to adapt communication style to fit team needs	optimize patient care	members, resolving conflict when needed
Understands the importance of feedback	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

Interpersonal and Communication Skills 4: Communication within Health Care Systems						
Level 1	Level 2	Level 3	Level 4	Level 5		
Accurately records information in the patient record as required by institutional policy	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		
Describes appropriate use of documentation shortcuts as required by institutional policy	Accurate, timely, and appropriate use of documentation shortcuts 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 (patient notes, email, etc.) that serves as an example for others to follow	Guides departmental or institutional communication around policies and procedures		
Comments:  Not Yet Completed Level 1						