

The Pediatric Anesthesiology Milestone Project

A Joint Initiative of

The Accreditation Council for Graduate Medical Education

The American Board of Anesthesiology



September 2014

The Pediatric Anesthesiology Milestone Project

The Milestones are designed only for use in evaluation of the fellow in the context of their participation in ACGME-accredited residency or fellowship programs. The Milestones provide a framework for assessment of the development of the fellow 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.

Pediatric Anesthesiology Milestones

Chair: Linda Mason, MD

Working Group

Ira Todd Cohen, MD, MEd
Peter Davis, MD
Laura Edgar, EdD, CAE
Randall Flick, MD, MPH
Anne Gravel Sullivan, PhD
Steve Hall, MD
Samuel Yanofsky, MD, MEd

Advisory Group

Louis Ling, MD
Santhanam Suresh, MD
Margaret Wood, MD, FRCA, EM

Milestone Reporting

This document presents Milestones designed for programs to use in semi-annual review of fellow performance and reporting to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME competencies organized in a developmental framework from less to more advanced. They are descriptors and targets for fellow performance as a fellow moves from entry into fellowship through graduation. In the initial years of implementation, the Review Committee will examine Milestone performance data for each program's fellows as one element in the Next Accreditation System (NAS) to determine whether fellows overall are progressing.

For each period, review and reporting will involve selecting milestone levels that best describe a fellow's current performance and attributes. Milestones are arranged into numbered levels. Tracking from Level 1 to Level 5 is synonymous with moving from novice to expert in the subspecialty.

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

Level 1: The fellow demonstrates milestones expected of an incoming fellow.

Level 2: The fellow is advancing and demonstrates additional milestones, but is not yet performing at a mid-fellowship level.

Level 3: The fellow continues to advance and demonstrate additional milestones, consistently including the majority of milestones targeted for fellowship.

Level 4: The fellow has advanced so that he or she now substantially demonstrates the milestones targeted for fellowship. This level is designed as the graduation target.

Level 5: The fellow has advanced beyond performance targets set for fellowship and is demonstrating "aspirational" goals which might describe the performance of someone who has been in practice for several years. It is expected that only a few exceptional fellows will reach this level.

Additional Notes

Level 4 is designed as the graduation *target* and *does not* represent a graduation *requirement*. Making decisions about readiness for graduation is the purview of the fellowship program director. Study of Milestone performance data will be required before the ACGME and its partners will be able to determine whether milestones in the first four levels appropriately represent the developmental framework, and whether Milestone data are of sufficient quality to be used for high-stakes decisions.

Examples are provided with some milestones. Please note that 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 the ACGME supervision guidelines, as well as institutional and program policies. For example, a fellow who performs a procedure independently must, at a minimum, be supervised through oversight.

Answers to Frequently Asked Questions about the Next Accreditation System and Milestones are posted on the Next Accreditation System section of the ACGME website.

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 fellow's performance on the milestones for each sub-competency will be indicated by selecting the level of milestones that best describes that fellow's performance in relation to those milestones.

Patient Care: Pre-Anesthetic Patient Evaluation, Assessment, and Preparation				
Level 1	Level 2	Level 3	Level 4	Level 5
Obtains general age appropriate histories and performs physical examinations	Identifies disease processes and medical issues specific to the anesthetic care of children	Identifies disease processes and medical or surgical issues relevant to pediatric anesthetic care; may need guidance in identifying unusual clinical problems and their implications for anesthesia care	Performs a complete assessment of complex or critically-ill children across the age spectrum with conditional independence	Independently performs comprehensive assessment for all pediatric patients
Identifies clinical issues relevant to anesthetic care of the non-complex child with direct supervision	Optimizes preparation of non-complex pediatric patients receiving anesthetic care	Optimizes preparation of pediatric patients with complex problems with indirect supervision	Optimizes preparation of complex or critically-ill children across the age spectrum with conditional independence	Independently serves as a consultant to other members of the health care team regarding optimal pre-anesthetic preparation
Identifies the elements and process of informed consent as it applies to children and families	Obtains informed consent and assent when appropriate for routine anesthetic care; discusses likely risks, benefits, and alternatives in a straightforward manner; responds appropriately to patient's or surrogate's questions; recognizes when assistance is needed	Obtains appropriate informed consent/assent tailored to complicated clinical situations with indirect supervision	Obtains appropriate informed consent from parent/guardian and patient assent as appropriate with conditional independence	Ensures that informed consent and assent are comprehensive and address patient and family needs
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Selecting a response box in the middle of a level implies that milestones in that level and in lower levels have been substantially demonstrated.

Selecting a response box on the line in between levels indicates that milestones in lower levels have been substantially demonstrated as well as **some** milestones in the higher level(s).

Patient Care: Pre-Anesthetic Patient Evaluation, Assessment, and Preparation				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Obtains general age-appropriate histories and performs physical examinations</p> <p>Identifies, with direct supervision, clinical issues relevant to anesthetic care of the non-complex child</p> <p>Identifies the elements and process of informed consent as they applies to children and families</p>	<p>Identifies disease processes and medical issues specific to the anesthetic care of children</p> <p>Optimizes preparation of non-complex pediatric patients receiving anesthetic care</p> <p>Obtains informed consent and assent when appropriate for routine anesthetic care; discusses likely risks, benefits, and alternatives in a straightforward manner; responds appropriately to patient's or surrogate's questions; recognizes when assistance is needed</p>	<p>Identifies disease processes and medical or surgical issues relevant to pediatric anesthetic care; may need guidance in identifying unusual clinical problems and their implications for anesthesia care</p> <p>With indirect supervision, optimizes preparation of pediatric patients with complex problems</p> <p>With indirect supervision, obtains appropriate informed consent/assent tailored to complicated clinical situations</p>	<p>With conditional independence, performs a complete assessment of complex or critically-ill children across the age spectrum</p> <p>With conditional independence, optimizes preparation of complex or critically-ill children across the age spectrum</p> <p>With conditional independence, obtains appropriate informed consent from parent/guardian, and patient assent as appropriate</p>	<p>Independently performs comprehensive assessment for all pediatric patients</p> <p>Independently serves as a consultant to other members of the health care team regarding optimal pre-anesthetic preparation</p> <p>Ensures that informed consent and assent are comprehensive and address patient and family needs</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Patient Care: Technical Skills				
Level 1	Level 2	Level 3	Level 4	Level 5
Recognizes unique characteristics of pediatric anatomy, as pertains to routine airway management, regional anesthesia, and vascular access	Under direct supervision, performs routine pediatric airway management, regional anesthesia, and vascular access across the age spectrum	Under direct supervision, performs advanced pediatric airway management, regional anesthesia, and vascular access across the spectrum of complex and non-complex patients	With conditional independence, identifies and corrects problems and complications associated with the unique characteristics of pediatric anatomy, as pertains to airway management, regional anesthesia, and vascular access Manages complex airways, advanced regional anesthetics, and difficult vascular access, as well as potential associated complications	Independently identifies and corrects problems and complications associated with the unique characteristics of pediatric complex and non-complex anatomy, as pertains to advanced airway management, regional anesthesia, and vascular access Independently supervises and provides consultation to other members of the health care team for advanced airway management, regional anesthetics, and difficult vascular access, as well as management of complications
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Patient Care: Peri-operative Planning and Management				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Formulates patient care plans that include consideration of underlying clinical conditions, past medical history, and patient, medical, or surgical risk factors unique to the pediatric patient</p> <p>Adapts to new settings for delivery of pediatric patient care</p>	<p>Formulates intra- and post-operative plans for pediatric patients undergoing routine procedures that include consideration of underlying clinical conditions, past medical history, patient, anesthetic, and surgical risk factors unique to pediatric patients</p> <p>With indirect supervision, conducts routine intra- and post-operative care, including management of commonly-encountered age-dependent physiologic alterations associated with anesthetic care</p>	<p>Formulates intra- and post-operative plans for pediatric patients undergoing increasingly complex procedures that include consideration of medical, anesthetic, and surgical risk factors, and that take into consideration factors unique to pediatric patients</p> <p>Conducts intra-operative and post-operative care with indirect supervision, but may require direct supervision for more complex procedures and patients</p>	<p>With conditional independence, formulates and tailors intra- and post-operative care plans that include consideration of peri-operative medical, anesthetic, and surgical risk factors unique to pediatric patients with complex medical issues undergoing complex procedures</p> <p>With conditional independence, conducts complex intra- and post-operative care; may supervise others in the management of complex clinical problems</p>	<p>Independently formulates intra- and post-operative care plans that include consideration of medical, anesthetic, and surgical risk factors for complex patients and procedures</p> <p>Performs complex intra- and post-operative care independently</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Medical Knowledge: Knowledge of Biomedical, Epidemiologic, and Developmental Sciences related to Pediatric Anesthesiology				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates current knowledge of: <ul style="list-style-type: none"> • cardiovascular, respiratory, renal, hepatic, and central nervous system physiology, pathophysiology, and therapy • metabolic and endocrine effects of surgery and critical illness • infectious disease pathophysiology and therapy • coagulation abnormalities and therapy • normal and abnormal physical and psychological development • congenital anomalies and developmental delay 	Articulates current knowledge of: <ul style="list-style-type: none"> • cardiovascular, respiratory, renal, hepatic, and central nervous system physiology, pathophysiology, and therapy • metabolic and endocrine effects of surgery and critical illness • infectious disease pathophysiology and therapy • coagulation abnormalities and therapy • normal and abnormal physical and psychological development • congenital anomalies and developmental delay 	Expands knowledge of: <ul style="list-style-type: none"> • cardiovascular, respiratory, renal, hepatic, and central nervous system physiology, pathophysiology, and therapy • metabolic and endocrine effects of surgery and critical illness • infectious disease pathophysiology and therapy • coagulation abnormalities and therapy • normal and abnormal physical and psychological development • congenital anomalies and developmental delay 	Synthesizes current knowledge of: <ul style="list-style-type: none"> • cardiovascular, respiratory, renal, hepatic, and central nervous system physiology, pathophysiology, and therapy • metabolic and endocrine effects of surgery and critical illness • infectious disease pathophysiology and therapy • coagulation abnormalities and therapy • normal and abnormal physical and psychological development • congenital anomalies and developmental delay 	Advances the specialty of pediatric anesthesiology through scholarly activity such as research, education, quality, safety, and leadership
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Medical Knowledge: Knowledge of Clinical and Behavioral Sciences related to Pediatric Anesthesiology				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates current of knowledge of: <ul style="list-style-type: none"> • medical and surgical problems common in children • use and toxicity of local and general anesthetic agents • airway problems common in children • pain management in pediatric patients of all ages • ethical and legal aspects of care • transport of critically-ill patients • trauma, including burn management • organ transplantation in children • post-anesthetic care and critical care management 	Articulates current knowledge of: <ul style="list-style-type: none"> • medical and surgical problems common in children • use and toxicity of local and general anesthetic agents • airway problems common in children • pain management in pediatric patients of all ages • ethical and legal aspects of care • transport of critically-ill patients • trauma, including burn management • organ transplantation in children • post-anesthetic care and critical care management 	Expands current knowledge of: <ul style="list-style-type: none"> • medical and surgical problems common in children • use and toxicity of local and general anesthetic agents • airway problems common in children • pain management in pediatric patients of all ages • ethical and legal aspects of care • transport of critically-ill patients • trauma, including burn management • organ transplantation in children • post-anesthetic care and critical care management 	Synthesizes current knowledge of: <ul style="list-style-type: none"> • medical and surgical problems common in children • use and toxicity of local and general anesthetic agents • airway problems common in children • pain management in pediatric patients of all ages • ethical and legal aspects of care • transport of critically-ill patients • trauma, including burn management • organ transplantation in children • post-anesthetic care and critical care management 	Advances the specialty of pediatric anesthesiology through scholarly activity such as research, education, quality, safety, and leadership
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Systems-based Practice: Interdisciplinary and Transition of Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Requires direct supervision to effectively collaborate as a member of the interdisciplinary care team within the health care system</p> <p>Requires direct supervision for effective transitions of care within the health care system</p>	<p>Effectively collaborates as a member of an interdisciplinary care team during routine care within the health care system with indirect supervision</p> <p>Requires direct supervision to effectively collaborate during complex clinical situations (e.g., emergencies, etc.) within the health care system</p> <p>Manages transitions of care within the health care system with indirect supervision</p>	<p>With indirect supervision, manages the interdisciplinary care team for all clinical situations within and between health care systems</p> <p>With direct supervision, coordinates transitions of care for all clinical situations within and between health care delivery systems</p>	<p>With conditional independence, leads the interdisciplinary care team for all clinical situations</p> <p>With conditional independence, coordinates transitions of care for all clinical situations</p>	<p>Develops methods to optimize and coordinate care throughout the continuum</p> <p>Serves as a role model and teacher in demonstrating effective methods for coordination of care during transitions across health care systems</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Systems-based Practice: Incorporation of Patient Safety and Quality Improvement into Clinical Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
Requires prompting to consistently incorporate patient safety principles into clinical practice Requires direct supervision to incorporate principles of continuous quality improvement into clinical practice	Identifies common causes of clinical errors and medical device-related hazards and complications, and communicates them to faculty and staff members Reports near misses and complications associated with clinical care using incident reporting system	Identifies opportunities and activities to optimize patient safety and quality of care and initiates quality improvement processes to address them Reports near misses and collaborates with colleagues to identify ways to reduce their occurrence Participates in root cause analyses and sentinel event reviews	Actively participates in patient safety initiatives and quality improvement activities Identifies opportunities to improve practice to optimize patient care Utilizes data about clinical practice to define opportunities to improve patient care	Leads a patient safety or quality improvement initiative
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Systems-based Practice: Understanding of Health Care Economics: Cost Awareness and Cost-benefit Analysis				
Level 1	Level 2	Level 3	Level 4	Level 5
Requires prompting to consider costs of medications, devices, and procedures when making clinical decisions	Understands general concepts related to the economics of clinical practice, including to the costs of care, cost vs. charge relationships, and cost-benefit implications, when selecting medications, devices, and procedures	Identifies opportunities to analyze costs relative to benefit of clinical interventions and practice patterns Identifies ways to reduce costs while maintaining or improving quality of care	Consistently incorporates cost awareness and cost-benefit analysis into clinical practice Initiates programs to reduce costs and improve efficiency of clinical care	Leads a team or teams to determine the most cost-effective strategies for all aspects of a procedure Participates in LEAN and other reengineering projects to improve clinical care and reduce costs
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Practice-based Learning and Improvement: Self-directed Learning and Scholarly Activity				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Completes assigned/recommended readings and reviews literature related to specific patient problems</p> <p>Participates in journal clubs, morbidity and mortality conferences, and other educational activities</p>	<p>Critically evaluates the scientific literature and understands limitations in addressing clinical issues</p> <p>Uses self-directed literature review to modify patient care</p> <p>Identifies mentor(s) to optimize education in data analysis, statistics, and research design</p>	<p>Independently integrates evidence-based practices into clinical care</p> <p>Participates in clinical research projects within the subspecialty</p>	<p>Participates in development of evidence-based clinical protocols and guidelines</p> <p>Analyzes and modifies practice based on self-directed learning</p> <p>Identifies opportunities to improve personal clinical practices and learning from multiple sources</p>	<p>Designs and implements clinical research studies based on appropriate research design</p> <p>Publishes a case report, clinical review article, or other scholarly manuscript</p> <p>Serves as research mentor to other providers</p> <p>Participates in editorial reviews and other scholarly activity for appropriate medical journals</p> <p>Participates in professional society and other activities to advance scholarship</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Practice-based Learning and Improvement: Education of Team Members and Other Health Care Providers				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Disseminates educational information and guidance clearly and effectively to medical students, residents, and other health care team members</p> <p>With prompting, communicates plans for care, and their rationale, to other health care providers</p>	<p>With indirect supervision, effectively explains clinical decision making and its rationale to other members of the health care team</p> <p>Effectively presents relevant information at departmental educational conferences</p>	<p>Seeks opportunities to provide thoughtful and relevant communication to other members of the health care team in the clinical setting and in presentations at educational conferences</p>	<p>Actively promotes education of all team members and other providers regarding clinical practice and optimizing patient care</p> <p>Coordinates conferences and case discussions</p> <p>Disseminates educational research through presentations and/or publications</p>	<p>Develops patient-oriented educational materials to optimize communication with patients and families</p> <p>Develops an educational curriculum for members of the health care team to optimize understanding of clinical issues and quality of care</p> <p>Serves as a role model for teaching and mentoring, or receives a teaching award</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Professionalism: Commitment to Institution, Department, and Colleagues				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Complies with institutional policies and regulations, including those pertaining to duty hours</p> <p>Volunteers to assist colleagues, when appropriate, to cover illnesses/absences</p> <p>Completes requested evaluations (e.g., faculty member, program, peers, ACGME Resident Survey) in a timely manner</p>	<p>Acts as a reliable team member, recognizing the impact of one's own work responsibilities on the institution and on one's colleagues</p>	<p>Serves as a resource to residents and medical students during routine clinical care</p> <p>Serves as a role model and responsible representative of the division/program/department</p>	<p>Seeks to participate in departmental and institutional committees</p> <p>Serves as a resource to medical students and residents after adverse clinical outcomes</p>	<p>Participates in regional or national committees; chairs institutional, regional, or national committees</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Professionalism: Receiving and Giving of Feedback				
Level 1	Level 2	Level 3	Level 4	Level 5
Seeks constructive feedback from faculty members and colleagues	When prompted, provides constructive feedback in a tactful and supportive way to residents and medical students Accepts feedback from faculty members, and incorporates suggestions into practice	Consistently seeks and provides feedback from faculty members and other members of the care team Correlates feedback with self-reflection, and incorporates it into lifelong learning to enhance patient care	Provides constructive feedback in a tactful and supportive way to physician and non-physician members of the care team to enhance patient care	Effectively seeks and provides constructive feedback in challenging situations (e.g., when there is resistance, there are adverse outcomes, or an experienced practitioner is involved)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Professionalism: Responsibility to Maintain Personal Emotional, Physical, and Mental Health				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Demonstrates basic professional responsibilities, such as reporting for work rested and prepared with appropriate professional attire and grooming</p> <p>Demonstrates knowledge of basic requirements related to fatigue management, sleep deprivation, and principles of physician well-being</p> <p>Recognizes the need to balance patient, personal, institutional, and societal needs when providing health care</p>	<p>Demonstrates the ability to balance personal, institutional, and societal goals with professional responsibilities</p> <p>Identifies departmental and institutional resources available to address issues related to personal well-being in self and others</p>	<p>Reports concerns about the health or well-being of colleagues to a more experienced individual</p> <p>Reinforces to residents the importance of compliance with systems to prevent impairment</p> <p>Recognizes the impact of adverse outcomes on one's personal well-being and seeks assistance in addressing it</p>	<p>Teaches residents and students the need to balance patient, personal, institutional, and societal needs when providing health care</p>	<p>Serves as a resource for the development of organizational policies and procedures regarding professional responsibilities</p> <p>Assists with or leads management of suspected impaired colleagues</p> <p>Serves as resource for colleagues returning from treatment for impairment</p> <p>Serves on institutional well-being committee</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Interpersonal and Communications Skills: Communication with Patients and Families				
Level 1	Level 2	Level 3	Level 4	Level 5
<p>Effectively communicates routine information in a developmentally-appropriate manner</p> <p>Obtains informed consent/assent for routine procedures using language appropriate to the patient's and family's level of understanding</p> <p>Recognizes situations where communication of information requires the assistance of another individual and asks for help</p> <p>Identifies situations where patient and family conflicts exist, and appropriately seeks assistance with resolution</p> <p>Recognizes that institutional resources are available to assist with disclosure of medical errors</p>	<p>Effectively uses appropriate resources (e.g., translator, patient representative) to optimize communication</p> <p>Effectively participates in multidisciplinary communication</p> <p>Manages simple patient and family conflicts</p> <p>Consults appropriate institutional resources (e.g., Risk Management, Bioethics Committee)</p>	<p>With direct supervision, manages patient and family conflicts in complex situations (e.g., cultural factors, end-of-life issues, custodial issues), including in communication with persons of different socioeconomic and cultural backgrounds</p> <p>Demonstrates the ability to disclose medical errors or complications</p>	<p>With conditional independence, manages patient and family conflicts in complex situations</p> <p>With conditional independence, discloses medical errors or complications</p>	<p>Consistently ensures that effective communication and resolution of concerns occurs with patients and/or families</p> <p>Independently manages patient and family conflicts in all situations</p> <p>Independently discloses medical errors or medical complications</p> <p>Models cross-cultural communication and establishes therapeutic relationships with persons of diverse socioeconomic and cultural backgrounds</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				