

# **Anesthesiology Milestones**

The Accreditation Council for Graduate Medical Education



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# Anesthesiology 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 competence 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.

### **Anesthesiology Milestones**

#### Work Group

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American Board of Anesthesiology American Osteopathic Association American Osteopathic College of Anesthesiologists Review Committee for Anesthesiology Society for Education in Anesthesia

## **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.

Practice-based Learning and improvement 2. Reflective Practice and Communent to Personal Growth				
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 form 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 performance deficits	Analyzes and acknowledges the factors which contribute to performance deficits	Institutes behavioral change(s) to improve performance	Considers alternatives to improve performance	Models reflective practice
Actively seeks opportunities to improve	Designs and implements a learning plan, with prompting	Independently creates and implements a learning plan	Integrates performance data to adapt the learning plan	Facilitates the design and implementation of learning plans for others
Comments: Not Yet Completed Level 1				
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#### Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth

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Patient Care 1: Pre-Anesthetic Evaluation				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs basic chart review	Performs focused chart review, with indirect supervision	Interprets chart review information to assess need for further work-up	Evaluates diagnostic data and provides risk stratification based on comorbidities and anesthetic implications	
Conducts patient interview, with direct supervision	Interviews the patient and gathers pertinent information, with indirect supervision	Interprets information collected during patient interview, with assistance	Independently identifies the need for additional evaluation and suggests therapeutic interventions	
Conducts and interprets a physical examination, with direct supervision	Conducts a focused physical examination, with indirect supervision	Identifies comorbidities on physical examination that may require further evaluation, with indirect supervision	Independently identifies concerning physical exam findings that require further evaluation	Independently identifies a previously undiagnosed condition
Comments: Not Yet Completed Level 1 Not Yet Assessable				

Patient Care 2: Peri-Operative Care and Management				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies the components of an anesthetic plan	Develops an anesthetic plan for a healthy patient undergoing uncomplicated procedures	Develops an anesthetic plan for patients with well- controlled comorbidities or undergoing complicated procedures	Develops an anesthetic plan for patients with multiple, uncontrolled comorbidities, and undergoing complicated procedures	
Identifies the components of a pain management plan	Implements simple peri- operative pain management plan	Identifies patients with a history of chronic pain who require a modified peri-operative pain management plan	Implements the anesthetic plan for patients with complex pain history and polypharmacy	In collaboration with other specialists, develops protocols for multimodal analgesia plan for patients with a complex pain history and substance use disorder
Identifies potential impact of anesthesia beyond intra-operative period	Identifies patient specific risks factors for long-term anesthetic effects	Develops the anesthetic plan based on risk factors to mitigate the long-term impact of anesthesia	Implements the anesthetic plan to mitigate the long-term impact of anesthesia	Develops departmental or institutional protocols for reduction of the long-term impact of anesthesia
Comments: Not Yet Completed Level 1				

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies standard monitors	Independently selects central and arterial catheters based on patient comorbidities and procedure	Selects advanced monitors based on patient comorbidities and procedure, with supervision	Independently selects advanced monitors based on patient comorbidities and procedure	
Applies standard monitors to patients	Inserts central and arterial catheters, with supervision	Inserts or applies advanced monitors, with supervision	Independently inserts or applies advanced invasive monitors	Functions as a consultant for difficult advanced monitor placement
Interprets standard monitoring data	Addresses malfunctions in standard monitors and interprets data from central and arterial lines, with supervision	Recognizes and addresses malfunctions in advanced monitors and interprets data, with supervision	Independently interprets data, recognizes, and addresses malfunctions in monitors and other anesthesia equipment	Participates in the research and/or development of protocols for monitoring technology

Patient Care 4: Intra-Operative Care				
Level 1	Level 2	Level 3	Level 4	Level 5
Assists in the initiation of the anesthetic	Plans and initiates the anesthetic for healthy patients undergoing uncomplicated procedures	Plans and initiates the anesthetic in a patient with well-controlled comorbidities, or undergoing complicated procedures	Independently plans and initiates the anesthetic in a patient with multiple, uncontrolled comorbidities undergoing complicated procedures	
Assists in maintenance of anesthetic care	Manages expected events during anesthetic care, with supervision	Independently manages expected events during anesthetic care	Independently manages unexpected events during anesthetic care	Manages rare events during anesthetic care
Assists with emergence from anesthesia	Anticipates and manages expected events during emergence, with supervision	Anticipates and manages unexpected events during emergence, with supervision	Independently anticipates and manages unexpected events during emergence	Manages rare events during emergence
Comments: Not Yet Completed Level 1				

Patient Care 5: Airway Management				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs basic airway assessment	Uses the airway exam and identifiable risk factors to formulate a patient-specific plan	Devises airway management plans that address contingencies, with supervision	Independently devises airway management plans that address contingencies	
Performs bag-mask ventilation in uncomplicated airway	Prepares basic equipment and manages an uncomplicated airway	Prepares and incorporates advanced equipment in the management of a complicated airway, with supervision	Independently prepares and incorporates advanced equipment in the management of a complicated airway	Functions as an expert in an airway crisis for complicated airways
Comments:				completed Level 1

Patient Care 6: Point-of-Care Ultrasound				
Level 1	Level 2	Level 3	Level 4	Level 5
Lists and explains the basic science and terminology of ultrasound	Selects ultrasound equipment for procedures, with supervision	Selects ultrasound equipment for a patient with difficult anatomy, with supervision	Independently selects proper ultrasound equipment and settings for indicated scenarios	Participates in research of emerging ultrasound procedures
Identifies relevant anatomy using ultrasound	Conducts point-of-care ultrasound, with supervision	Interprets point-of-care ultrasound, with supervision	Independently conducts and interprets point-of- care ultrasound	Participates in the development of institutional protocols for point-of-care ultrasound
Uses ultrasound for vascular access in routine situations, with supervision	Uses ultrasound for vascular access in routine situations	Uses ultrasound for vascular access in complex situations, with supervision	Independently uses ultrasound for vascular access in complex situations	
Comments: Not Yet Completed Level 1				

Patient Care 7: Situational Awareness and Crisis Management				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates vigilance during clinical care	Demonstrates awareness of case flow and developments throughout a procedure	Demonstrates awareness of case flow and developments throughout a procedure, including those outside of one's own immediate control, with supervision	Independently demonstrates awareness of case flow and developments throughout a procedure, including those outside of one's own immediate control	
Articulates causes of common peri-operative crisis situations	Recognizes crisis situations; calls for help	Anticipates impending crisis and identifies possible etiologies with supervision	Independently anticipates impending crisis and identifies possible etiologies	
Responds to crisis situations as a reliable team member	Participates in management during crisis situations	Initiates management and resolves crisis situations, with supervision	Independently initiates management and resolves crisis situations	Leads the health care team in the management of crisis situations
Comments: Not Yet Completed Level 1				

Patient Care 8: Post-Ope	erative Care			
Level 1	Level 2	Level 3	Level 4	Level 5
Outlines post-operative disposition options for patients	Plans disposition for uncomplicated procedures	Identifies unexpected changes in patient status meriting change in disposition, with supervision	Independently identifies unexpected changes in patient status meriting change in disposition	Develops protocols for disposition based on procedure and patient comorbidities
Lists complications commonly encountered post-operatively	Diagnoses, manages, and documents commonly encountered complications arising from anesthetic care, with supervision	Diagnoses, manages, and documents uncommon complications arising from anesthetic care, with supervision	Independently diagnoses, manages, and documents uncommon complications arising from anesthetic care	
Comments:			Not Yet C Not Yet A	ompleted Level 1

Patient Care 9: Critical Care				
Level 1	Level 2	Level 3	Level 4	Level 5
Acquires data for the care of the critically-ill patient	Interprets routine diagnostic data in the care of critically-ill patients	Interprets advanced diagnostic data in the care of critically-ill patients, with supervision	Independently interprets advanced diagnostic data in the care of critically-ill patients	
Recognizes when a patient is critically ill	Prioritizes the care of the critically-ill patient	Prioritizes the care of multiple critically-ill patients, with supervision	Independently prioritizes the care of multiple critically-ill patients	Leads and deploys resources in the care of the critically-ill patient
	Implements the care team's plan for a critically- ill patient	Develops and implements a comprehensive plan of care for the critically-ill patient, with supervision	Develops and implements a comprehensive plan of care for the critically-ill patient	Functions in a supervisory role managing all patients in a unit and the unit's resources
Comments:   Not Yet Completed Level 1   Not Yet Assessable				

Level 1	Level 2	Level 3	Level 4	Level 5
Describes anatomy relevant to regional anesthesia	Describes indications and contraindications for regional anesthesia	Develops a patient- and procedure-specific regional anesthesia plan, with supervision	Independently develops a patient- and procedure-specific regional anesthesia plan	
Prepares the patient and the equipment for common regional anesthesia techniques	Performs regional anesthesia techniques, with direct supervision	Performs regional anesthesia techniques, with indirect supervision	Independently performs regional anesthesia techniques	Serves as a consultant on advanced or difficult regional techniques
Describes potential complications of regional anesthesia	Recognizes and manages complications of regional anesthesia, with direct supervision	Recognizes and manages complications of regional anesthesia, with indirect supervision	Independently recognizes and manages complications of regional anesthesia	Develops institutional protocol for using regional anesthesia and managing complications

Medical Knowledge 1: Foundational Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of pathophysiology and treatment of medical and surgical conditions	Demonstrates knowledge of common medical and surgical disease, treatments, and populations as it relates to anesthetic care	Demonstrates knowledge of complex medical and surgical disease, treatments, and populations as it relates to anesthetic care	Demonstrates comprehensive knowledge of medical and surgical disease as it relates to the full spectrum of the patient's peri-operative care	Demonstrates scientific knowledge of uncommon, atypical, or complex conditions as it relates to the full spectrum of the patient's peri-operative care
Identifies medications used to treat common comorbidities	Demonstrates knowledge of pharmacology of medications routinely used in anesthetic care	Demonstrates knowledge of medications used in subspecialty areas (e.g., cardiac, obstetrics)	Demonstrates comprehensive knowledge of pharmacology in the setting of complex comorbidities	Participates in research related to pharmacology
Comments: Not Yet Completed Level 1 Not Yet Assessable				

Medical Knowledge 2: C	linical Reasoning				
Level 1	Level 2	Level 3	Level 4	Level 5	
Organizes and accurately summarizes information obtained from the patient evaluation to develop a clinical impression	Integrates information from all sources to develop a basic differential diagnosis for common patient presentations	Develops a thorough and prioritized differential diagnosis for common patient presentations	Develops prioritized differential diagnoses in complex patient presentations and incorporates subtle, unusual, or conflicting findings	Coaches others to develop prioritized differential diagnoses in complex patient presentations	
Lists types of clinical reasoning errors	Identifies clinical reasoning errors within patient care, with guidance	Retrospectively applies clinical reasoning principles to identify errors	Continually re-appraises one's clinical reasoning to improve patient care in real time	Models how to recognize errors and reflect upon one's own clinical reasoning	
Comments:	Comments: Not Yet Completed Level 1				

Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of common events that impact patient safety	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 departmental quality improvement initiatives	Participates in department 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 level or above
metrics			improvement project	above

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	Analyzes the process of care coordination and participates 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	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 institutional 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	Advocates for populations and communities with health care inequities in the peri-operative setting

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	
States factors impacting the costs of anesthetic care	Documents anesthetic detail to facilitate accurate billing and reimbursement	Explains the impact of documentation on billing and reimbursement	Practices and advocates for cost- effective patient care	Engages in external activities related to advocacy for cost- effective care	
Comments:	Comments:				

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice					
Level 1	Level 2	Level 3	Level 4	Level 5	
Accesses and uses evidence in routine patient care	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	Appraises and applies evidence, even in the face of uncertainty and conflicting evidence, to guide individualized care	Coaches others to appraise and apply evidence for complex patients and/or participates in the development of guidelines	
Comments:			Not Yet C	ompleted Level 1	

Practice-Based Learning	Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth				
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 form 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 that contribute to performance deficits	Analyzes and acknowledges the factors that contribute to performance deficits	Institutes behavioral change(s) to improve performance	Considers alternatives to improve performance	Models reflective practice	
Actively seeks opportunities to improve	Designs and implements a learning plan, with prompting	Independently creates and implements a learning plan	Integrates performance data to adapt the learning plan	Facilitates the design and implementation of learning plans for others	
Comments:	Comments:				

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies 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 oneself	Coaches others when their behavior fails to meet professional expectations
Describes when and how to report lapses in professionalism	Takes responsibility for one's own professionalism lapses	Recognizes need to seek help in managing and resolving complex interpersonal situations	Actively solicits help and acts on recommendations to resolve complex interpersonal situations	
Demonstrates knowledge of the ethical principles underlying patient care	Analyzes straightforward situations using ethical principles	Analyzes complex situations using ethical principles	Recognizes and utilizes resources for managing and resolving ethical dilemmas	Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution

Level 1	Level 2	Level 3	Level 4	Level 5
Responds promptly to requests or reminders to complete tasks	Performs tasks and responsibilities in a timely manner	Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations	Prioritizes tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations	
Takes responsibility for failure to complete tasks	Recognizes situations that may impact one's own ability to complete tasks and responsibilities in a timely manner	Takes responsibility for tasks not completed in a timely manner and identifies strategies to prevent recurrence	Proactively implements strategies to ensure that the needs of patients, teams, and systems are met	Designs and implements an institutional systems approach to ensure timely task completion and shared responsibility

Professionalism 3: Well-Being					
Level 1	Level 2	Level 3	Level 4	Level 5	
Recognizes the importance of addressing personal and professional well-being	Lists available resources for 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	Creates institutional-level interventions that promote colleagues' well-being	
	Describes institutional resources that are meant to promote well-being	Recognizes which institutional factors affect well-being	Describes institutional factors that positively and/or negatively affect well-being	Describes institutional programs designed to examine systemic contributors to burnout	
Comments:			Not Yet C	ompleted Level 1	

Level 1	Level 2	Level 3	Level 4	Level 5
Communicates with patients and their families in an understandable and respectful manner	Customizes communication in the setting of personal biases and barriers with patients and patients' families	Explains complex and difficult information to patients and patients' families	Facilitates difficult discussions with patients and patients' families	Mentors others in the facilitation of crucial conversations
Provides timely updates to patients and patients' families	Actively listens to patients and patients' families to elicit patient preferences and expectations	Uses shared decision making to make a personalized care plan	Effectively negotiates and manages conflict among patients, patients' families, and the health care team	Mentors others in conflict resolution
Comments:			Not Yet C	Completed Level 1 (

	Level 2	Level 3	Level 4	Level 5
Respectfully requests or eceives consultations	Clearly, concisely and promptly requests or responds to a consultation	Uses closed-loop communication to verify understanding	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
Jses language that values all members of he health care team	Communicates information effectively with all health care team members	Adapts communication style to fit team needs	Maintains effective communication in crisis situations	Leads an after-event debrief of the health care team
Respectfully receives eedback from the health are team	Solicits feedback on performance as a member of the health care team	Communicates concerns and provides feedback to peers and learners	Communicates constructive feedback to superiors	Facilitates regular health care team-based feedback in complex situations

Interpersonal and Communication Skills 3: Communication within Health Care Systems				
Level 1	Level 2	Level 3	Level 4	Level 5
Accurately records information in the patient record; demonstrates judicious use of documentation shortcuts	Accurately records information in the anesthetic record for basic cases	Accurately records information in the anesthetic record and communicates complex care decisions for complex cases	Uses medical record functionality to highlight challenges in anesthetic care to facilitate future peri-operative management	Explores innovative uses of the medical record to facilitate peri-operative management
Safeguards patient personal health information	Documents required data in formats specified by institutional policy	Appropriately selects direct and indirect forms of communication based on context	Models exemplary written or verbal communication	Guides departmental or institutional policies and procedures around communication
Communicates through appropriate channels as required by institutional policy	Respectfully communicates concerns about the system	Respectfully communicates concerns about the system and contributes to solutions	Uses appropriate channels to offer clear and constructive suggestions to improve the system	Initiates difficult conversations with appropriate stakeholders to improve the system
Comments:			Not Yet C	ompleted Level 1