Adult Reconstructive Orthopaedic Surgery Milestones

The Accreditation Council for Graduate Medical Education



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The Milestones are designed only for use in evaluation of fellows in the context of their participation in ACGMEaccredited fellowship programs. The Milestones provide a framework for the 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.

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American Board of Orthopaedic Surgery

ACGME Review Committee for Orthopaedic Surgery

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Understanding Milestone Levels and Reporting

This document presents the Milestones, which programs use in a semi-annual review of resident/fellow 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/fellow 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 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, a junior fellow may achieve higher levels early in the educational program just as a senior fellow may be at a lower level later in the educational program. There is no predetermined timing for a fellow to attain any particular level. 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 fellow substantially demonstrates the milestones in that level, as well as those in lower levels (see the diagram on page v).

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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 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. 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 fellow 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.

Supplemental Guides and other resources are available on the Milestones page of each specialty section of the ACGME website. On <u>www.acgme.org</u>, choose the applicable specialty under the "Specialties" menu, then select the "Milestones" link in the lower navigation bar.

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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.

Medical Knowledge 1: Orthopaedic Clinical Decision Making				
Level 1	Level 2	Level 3	Level 4	Level 5
Articulates a methodology for clinical reasoning	Demonstrates clinical reasoning to determine treatment goals	Synthesizes information to make clinical decisions for straightforward conditions	Efficiently synthesizes information and integrates reflection to make clinical decisions for complex conditions	Incorporates clinical reasoning to improve care pathways
Identifies resources to direct clinical decisions	Selects and prioritizes relevant resources based on scenario to inform decisions	Integrates evidence- based information to inform diagnostic decision making for straightforward conditions	Integrates evidence- based information to inform diagnostic decision making for complex conditions	
middle of a lev milestones in t	sponse box in the rel implies that hat level and in lower en substantially	Selecting a response boy between levels indicates in lower levels have been demonstrated as well as milestones in the higher	x on the line in that milestones n substantially some	ompleted Level 1

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Level 1	Level 2	Level 3	Level 4	Level 5
Obtains appropriate medical history and performs a basic orthopaedic examination, with guidance	Obtains history of the condition or injury and performs an orthopaedic examination for common adult reconstructive conditions	Obtains history of the condition or injury, performs an orthopaedic examination, and recognizes complex or high-risk adult reconstructive conditions	Independently obtains history of conditions or injuries and consistently performs complex examinations of adult reconstructive conditions	Develops and publishes on a new physical examination maneuver
Identifies diagnostic testing for common adult reconstructive conditions	Interprets diagnostic testing for adult reconstructive conditions, with guidance	Orders and interprets diagnostic testing for complex adult reconstructive conditions, with guidance	Independently interprets diagnostic testing for complex adult reconstructive conditions	Develops a novel diagnostic technique or tool
Develops a basic differential diagnosis pertinent to common orthopaedic conditions, with guidance	Develops a basic differential diagnosis pertinent to adult reconstructive conditions, with guidance	Develops a comprehensive differential diagnosis based on the history and physical examination finding, with guidance	Independently develops a comprehensive differential diagnosis based on history and physical examination finding	

Patient Care 2: Non-Operative Management				
Level 1	Level 2	Level 3	Level 4	Level 5
Generates a basic treatment plan for common adult reconstructive conditions, with direct supervision	Generates a basic treatment plan for common adult reconstructive conditions, with indirect supervision	Generates and modifies a treatment plan for complex adult reconstructive conditions, with guidance	Independently generates and modifies individualized treatment plans	Develops and/or disseminates a novel treatment protocol
Manages patients with basic adult reconstructive conditions (e.g., knee injection, bracing, physical therapy prescription), with direct supervision	Manages patients with basic adult reconstructive conditions, with indirect supervision	Independently manages patients and adapts the management plan for basic adult reconstructive conditions	Independently manages patients and adapts the management plan for complex adult reconstructive conditions	
Comments: Not Yet Completed Level 1				

Patient Care 3: Arthroscopic Operative Skills				
Level 1	Level 2	Level 3	Level 4	Level 5
Develops a simple surgical plan, with indirect supervision	Develops a surgical plan that includes identification of potential challenges and technical complexities, with guidance	Develops a surgical plan for complex procedures, including contingencies for complications, with guidance	Independently develops a surgical plan for complex procedures, including contingencies for complications	
Demonstrates basic surgical skills (e.g., wound closure) and assists with procedures	Establishes portals and access and performs diagnostic knee and/or shoulder arthroscopy, with indirect supervision	Performs critical steps of knee and/or shoulder procedures, with guidance; establishes portals and access and performs hip and/or elbow arthroscopy, with indirect supervision	Independently performs complex procedures with skill and confidence	Develops novel surgical techniques
Identifies and reports simple complications	Identifies and manages simple complications, with guidance	Identifies and manages complex complications, with guidance	Independently develops a plan for managing complex complications	Contributes to quality improvement initiative regarding complications at the institution
Comments: Not Yet Completed Level 1 Not Yet Assessable				

Level 1	Level 2	Level 3	Level 4	Level 5
Develops a simple surgical plan, with indirect supervision	Develops a surgical plan that includes identification of potential challenges and technical complexities, with guidance	Develops a surgical plan for complex procedures, including contingencies for complications, with guidance	Independently develops a surgical plan for complex procedures, including contingencies for complications	
Demonstrates basic surgical skills (e.g., wound closure) and assists with procedures	Performs surgical approach, with indirect supervision	Performs critical steps of procedures, with guidance	Independently performs complex procedures with skill and confidence	Develops novel surgical techniques
Identifies and reports simple complications	Identifies and manages simple complications, with guidance	Identifies and manages complex complications, with guidance	Independently develops a plan for managing complex complications	Contributes to quality improvement initiative regarding complications at the institution

Patient Care 5: Knee and Hip Revision				
Level 1	Level 2	Level 3	Level 4	Level 5
Develops a simple surgical plan, with indirect supervision	Develops a surgical plan that includes identification of potential challenges and technical complexities, with guidance	Develops a surgical plan for complex revision procedures, including contingencies for complications, with guidance	Independently develops a surgical plan for revision complex procedures, including contingencies for complications	
Demonstrates basic surgical skills (e.g., wound closure) and assists with procedures	Performs surgical approach, with direct supervision	Performs surgical approach, with indirect supervision	Performs critical steps of procedures, with guidance	Independently performs complex revision procedures with skill and confidence
Identifies and reports simple complications	Identifies and manages simple complications, with guidance	Identifies and manages complex complications, with guidance	Independently develops a plan for managing complex complications	Contributes to quality improvement initiative regarding complications at the institution
Comments: Not Yet Completed Level 1				

Medical Knowledge 1: Orthopaedic Clinical Decision-Making				
Level 1	Level 2	Level 3	Level 4	Level 5
Articulates a methodology for clinical reasoning	Demonstrates clinical reasoning to determine treatment goals	Synthesizes information to make clinical decisions for straightforward conditions	Efficiently synthesizes information and integrates reflection to make clinical decisions for complex conditions	Incorporates clinical reasoning to improve care pathways
Identifies resources to direct clinical decisions	Selects and prioritizes relevant resources based on the scenario to inform decisions	Integrates evidence- based information to inform diagnostic decision-making for straightforward conditions	Integrates evidence- based information to inform diagnostic decision-making for complex conditions	
Comments:				ompleted Level 1

Medical Knowledge 2: Basic Science: Gross Anatomy, Biomechanics, Tribology, Implant Design, and Pathophysiology				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of regional gross anatomy	Demonstrates knowledge of surgical anatomy and pathophysiology	Applies knowledge of anatomy and pathophysiology to explain the effects of surgical or non-surgical treatment on patient outcomes for straightforward conditions	Applies knowledge of anatomy and pathophysiology to explain the effects of surgical or non-surgical treatment on patient outcomes for complex conditions	Develops and/or disseminates knowledge of adult reconstructive topics
Demonstrates knowledge of basic biomechanics, material properties, implant design, wear, and prosthetic joint infection	Demonstrates knowledge of diagnostic modalities for implant-related complications	Applies knowledge of diagnostic modalities for implant-related complications	Applies knowledge of implant design and selection based on pathology	
Comments:				ompleted Level 1

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	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:				

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 interprofessional team members	Coordinates care of patients in complex clinical situations effectively using the roles of interprofessional team members	Role models effective coordination of patient- centered care among multidisciplinary teams	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 straightforward 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	Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes

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Systems-Based Practice 3: Physician Role in Health Care Systems				
Level 1	Level 2	Level 3	Level 4	Level 5
Describes basic health payment systems, including government, private, public, and uninsured care, as well as different practice models	Describes how working within the health care system impacts patient care, including billing and coding	Analyzes how personal practice affects the system (e.g., length of stay, readmission rates, clinical efficiency)	Uses shared decision- making in patient care, taking into consideration costs to the patient	Participates in advocacy activities for health policy
Comments:			Not Yet C	ompleted Level 1

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Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates how to access and use available evidence and incorporate patient preferences and values to the care of a straightforward condition	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 conditions	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 conditions and/or participates in the development of guidelines
Comments: Not Yet Completed Level 1				

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Level 1	Level 2	Level 3	Level 4	Level 5
Accepts responsibility for personal and professional development by establishing goals	Demonstrates openness to feedback and other input to inform goals	Responds to feedback and other input episodically, with adaptability and humility	Actively seeks feedback and other input with adaptability and humility	Role models consistently seeking feedback and other input with adaptability and humility
Identifies the strengths, deficiencies, and limitations in one's knowledge and expertise	Analyzes and reflects on the strengths, deficiencies, and limitations in one's knowledge and expertise to design a learning plan, with assistance	Creates and implements a learning plan to optimize educational and professional development	Uses ongoing reflection, feedback, and other input to measure the effectiveness of the learning plan, and, when necessary, improves it	Coaches others on reflective practice

Level 1	Level 2	Level 3	Level 4	Level 5
Identifies and describes inciting events for professionalism lapses	Demonstrates insight into professional behavior in straightforward situations	Demonstrates professional behavior in complex situations	Recognizes situations that may promote professionalism lapses and intervenes to prevent lapses in oneself and others	Coaches others when their behavior fails to meet professional expectations
Demonstrates knowledge of the ethical principles underlying patient care (e.g., informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics)	Applies ethical principles in straightforward situations and takes responsibility for lapses	Integrates ethical principles and recognizes the need to seek help in complex situations	Recognizes and uses appropriate resources for managing and resolving ethical dilemmas (e.g., ethics consultations, literature review, risk management/legal consultation)	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
Reliably arrives to clinical activities on time and describes strategies for ensuring timely task completion	Performs tasks and responsibilities in a timely manner with appropriate attention to detail in straightforward situations	Prioritizes tasks and responsibilities in a timely manner with appropriate attention to detail in complex situations	Recognizes barriers that may impact others' ability to complete tasks and responsibilities in a timely manner	Develops processes to enhance other's ability to efficiently complete patient care tasks and responsibilities
Responds promptly to requests or reminders to complete tasks and responsibilities	Completes tasks and responsibilities without reminders	Proactively completes tasks and responsibilities to ensure that the needs of patients, teams, and systems are met		

Professionalism 3: Well-Being				
Level 1	Level 2	Level 3	Level 4	Level 5
Recognizes the importance of addressing personal and professional well-being (e.g., physical and	Lists available resources for personal and professional well-being	Discusses a plan to promote personal and professional well-being with institutional support	Independently develops a plan to promote personal and professional well-being	Creates institutional-level interventions that promote colleagues' well-being
emotional health)	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:	ended to evaluate a fellow's wel			ompleted Level 1

This subcompetency is not intended to evaluate a fellow's well-being, but to ensure each fellow has the fundamental knowledge of factors that impact wellbeing, the mechanisms by which those factors impact well-being, and available resources and tools to improve well-being.

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Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates respect and establishes rapport with patients and their families (e.g., situational awareness of language, disability, health literacy level, cultural differences)	Establishes a therapeutic relationship in straightforward encounters	Establishes a therapeutic relationship in challenging encounters (e.g., shared decision-making)	Facilitates difficult discussions with patients and their families, (e.g., explaining complications, therapeutic uncertainty)	Coaches others in the facilitation of difficult conversations
Communicates with patients and their families in an understandable and respectful manner	Identifies barriers to effective communication (e.g., health literacy, cultural differences)	When prompted, reflects on personal biases while attempting to minimize communication barriers	Recognizes biases and integrates the patient's viewpoint and autonomy to ensure effective communication	Mentors others in situational awareness and critical self-reflection
Demonstrates basic understanding of the informed consent process	Answers questions about straightforward treatment plans, with assistance	Counsels patients through the decision-making process for straightforward conditions	Counsels patients through the decision- making process for complex conditions	Counsels patients through the decision-making process for uncommon conditions

Interpersonal and Communication Skills 2: Interprofessional and Team Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Recognizes the value and role of each team member and respectfully interacts with all members of health care team	Communicates in a professional and productive manner to facilitate teamwork (e.g., active listening, updates in timely fashion)	Actively recognizes and mitigates communication barriers and biases with the health care team	Facilitates respectful communications and conflict resolution with the multidisciplinary health care team	Is an exemplar of effective and respectful communication strategies
Comments:			Not Yet C	ompleted Level 1

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Level 1	Level 2	Level 3	Level 4	Level 5
Accurately records information in the patient record while safeguarding patient personal health information	Demonstrates accurate, timely, and efficient use of the electronic health record to communicate with the health care team	Concisely reports diagnostic and therapeutic reasoning while incorporating relevant outside data	Independently communicates via written or verbal methods based on urgency and context	Facilitates improved written and verbal communication of others
	Uses appropriate communication methods (e.g., face-to-face, voice, electronic)	Respectfully initiates communications about concerns in the system	Uses appropriate channels to offer clear and constructive suggestions to improve the system	Guides departmental or institutional communication around policies and procedures