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 |
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| 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 |
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| 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 |
| | | | | |