Orthopaedic Surgery of the Spine 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 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.

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Work Group

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American Board of Orthopaedic Surgery 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 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 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 their educational program just as a senior fellow may be at a lower level later in their 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 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 vi).

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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.

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 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.

Patient Care 1: Lumbar Degenerative				
Level 1	Level 2	Level 3	Level 4	Level 5
Prepares patient for procedures, including patient positioning and post-operative plan, and performs posterior approach	Performs uncomplicated procedures (e.g., discectomy, simple laminectomy) and assists with anterior procedures	Performs common complex procedures (e.g. multilevel degenerative spondyloses) and assists with lateral approach	procedures (e.g.,	Performs rare or high-risk procedures (e.g., 360- degree fusion)
Manages simple complications	Identifies complex complications	Develops a plan for managing complex complications	Develops a plan and implements treatment of complex complications	Adapts surgical techniques for complex situations
Comments:			Not Yet C Not Yet A	ompleted Level 1
Selecting a response box in the				
middle of a level implies that milestones in that level and in lower levels have been substantially demonstrated.		b in d	electing a response l etween levels indicat h lower levels have be emonstrated as well hilestones in the high	es that milestones een substantially as some

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Patient Care 1: History and Physical Examination					
Level 1	Level 2	Level 3	Level 4	Level 5	
Obtains an appropriate medical history and performs a basic orthopaedic examination, with guidance	Obtains a history of the condition or injury and performs an orthopaedic examination for common spinal conditions	Obtains a history of the condition or injury, performs an orthopaedic examination, and recognizes complex or high-risk spinal conditions	Independently obtains a history of conditions or injuries and consistently performs complex examinations of spinal conditions	Develops and publishes on new physical examination maneuver	
Identifies diagnostic testing for common spinal conditions	Interprets diagnostic testing for spinal conditions, with guidance	Orders and interprets diagnostic testing for complex spinal conditions, with guidance	Independently interprets diagnostic testing for complex spinal 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 spinal 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 the history and physical examination finding		
Comments:	Comments: Not Yet Completed Level 1				

Level 1	Level 2	Level 3	Level 4	Level 5
Obtains a patient history, performs a physical examination, and develops a differential diagnosis for patients across clinical settings	Orders and interprets diagnostic testing and consultations based on patient evaluation	Synthesizes a plan to manage healthy patients with straightforward conditions, including operative and non- operative options	Synthesizes a comprehensive plan to manage patients with complex conditions and comorbidities	Develops a clinical pathway or guideline for the management of patients based on demonstrated clinical expertise
Manages patients with straightforward conditions (e.g., stable compression fracture), with indirect supervision	Manages patients with straightforward conditions (e.g., radiculopathy)	Independently manages patients and adapts the management plan for a changing clinical situation (e.g., development of neurologic deficit)	Leads an orthopaedic team in the management of patients with complex conditions (e.g., unstable fractures in the setting of medical comorbidities)	Leads a multidisciplinary team in the management of patients with complex conditions
Recognizes and initiates work-up of emergent conditions (e.g., cauda equina syndrome)	Formulates and executes a stabilization plan for emergent conditions	Triages management of multiple emergent conditions	Leads an orthopaedic team in the management of emergent conditions (e.g., polytrauma)	

Patient Care 3: Lumbar Degenerative				
Level 1	Level 2	Level 3	Level 4	Level 5
Prepares patients for procedures, including patient positioning and post-operative planning, and performs a posterior approach	Performs uncomplicated procedures (e.g., discectomy, simple laminectomy) and assists with anterior procedures	Performs common complex procedures (e.g., multilevel degenerative spondyloses) and assists with a lateral approach	Performs uncommon complex and revision procedures (e.g., revision TLIF) and common lateral approaches	Performs rare or high-risk procedures (e.g., 360- degree fusion)
Manages simple complications	Identifies complex complications	Develops a plan for managing complex complications	Develops a plan and implements treatment for complex complications	Adapts surgical techniques for complex situations
Comments: Not Yet Completed Level 1				

Prepares patients for lower cervical procedures, including patient positioning and post-operative planning, and performs a posterior approachPerforms uncomplicated procedures (e.g., simple anterior cervical discectomy and fusion [ACDF], simple laminectomy) and assists with an anterior approachPerforms common complex procedures (e.g., multilevel degenerative spondyloses, foraminotomy) and a primary anterior approach; prepares patients for upper cervical procedures (e.g., revision ACDF) and an anterior revision approachPerforms upper cervical and revision procedures (e.g., revision ACDF) and an anterior revision approachPerforms rare or high-risk and revision procedures (e.g., revision ACDF) and an anterior revision approachPerforms upper cervical and an anterior revision approachPerforms upper cervical and revision procedures (e.g., revision ACDF) and an anterior revision approachPerforms rare or high-risk and revision procedures (e.g., revision ACDF) and an anterior revision approachPerforms upper cervical and an anterior revision approachPerforms upper cervical approachPerforms upper cervical approachPerforms upper cervical approachPerforms upper cervical approachPerforms upper cervical approachPerforms upper cervical approachPerforms upper cervical proceduresPerforms upper cervical proceduresPerforms upper cervical proceduresPerforms upper cervical proceduresPerforms uper cervical procedures	Level 1	Level 2	Level 3	Level 4	Level 5
complicationscomplicationsmanaging complex complicationsimplements treatment for complextechniques for complex situations	lower cervical procedures, including patient positioning and post-operative planning, and performs a posterior	procedures (e.g., simple anterior cervical discectomy and fusion [ACDF], simple laminectomy) and assists	complex procedures (e.g., multilevel degenerative spondyloses, foraminotomy) and a primary anterior approach; prepares patients for upper cervical	and revision procedures (e.g., revision ACDF) and an anterior revision	
	•	-	managing complex	implements treatment for complex	techniques for complex

Level 1	Level 2	Level 3	Level 4	Level 5
Characterizes or classifies a disorder and discusses indications/ application of reduction techniques, positions the patient, and performs posterior approaches	Assists with common complex procedures (simple osteotomies, laminectomy, positional reduction, closed cervical reductions) and assists with anterior approaches	Performs common complex procedures (laminectomy, open posterior reduction/ stabilization of an unstable spine)	Performs uncommon complex or revision procedures (transpedicular decompression, corpectomy and reconstruction)	Performs rare or high-risk procedures (circumferential fusion, three-column osteotomies)
Manages simple complications	Identifies complex complications and coordinates effectively in the multidisciplinary team	Develops a plan for managing complex complications and initiates complex coordinated care	Develops a plan and implements treatment for complex complications	Adapts surgical techniques for complex situations
Comments:				

Patient Care 6: Deformity (scoliosis, coronal/sagittal deformity, isthmic spondylosis, proximal junctional kyphosis)					
Level 1	Level 2	Level 3	Level 4	Level 5	
Prepares patients for procedures, including assessment of skeletal age and bone quality, patient positioning, and post-operative planning; performs a posterior approach	Assists with common complex procedures (e.g., simple osteotomies, laminectomies)	Performs common complex procedures (e.g., simple osteotomies), assists with uncommon complex procedures	Performs pelvic fixation and uncommon complex procedures (e.g., pedicle osteotomies, revision transforaminal lumbar interbody fusion [TLIF], low grade spondylolistheses)	Performs rare or high-risk procedures (e.g., vertebral column resections, high-grade isthmic spondylolistheses)	
Manages simple complications	Identifies complex complications	Develops a plan for managing complex complications	Develops a plan and implements treatment for complex complications	Adapts surgical techniques for complex situations	
Comments:	Comments: Not Yet Completed Level 1				

Medical Knowledge 1: Anatomy, Indications, and Diagnostics					
Level 1	Level 2	Level 3	Level 4	Level 5	
Demonstrates knowledge of basic spinal anatomy, including surgical approaches	Identifies applied surgical approach, including nerve root variations and upper cervical vascular structures	Anticipates complications and presents a management plans based on review of complex or unusual patient anatomy	Routinely leads residents through surgical anatomy (e.g., anatomy course, operating room teaching)	Independently manages patients with complex or unusual anatomy or bone quality (e.g., osteogenesis imperfecta, ankylosing spondylitis)	
Obtains and documents an appropriate social and medical history, including a standard neurologic exam, signs or symptoms of spinal cord dysfunction, and coexisting medical or social risks	Synthesizes and prioritizes a differential diagnosis and anticipates potential complications for complex spinal conditions	Adapts the peri-operative plan for an existing patient risks (e.g., poor bone quality, opioid addiction, lack of social support)	Independently plans accommodative post- operative care, including bracing, post-operative therapy needs, and mobilization of social resources		
Obtains and provides a basic interpretation of relevant imaging studies	Independently evaluates plain films, magnetic resonance imaging (MRI) sequences, and computed tomography (CT) scans and discusses indications for other forms of imaging	Identifies the role of post- operative imaging to assess healing, complications, and instrumentation failure	Appropriately requests advanced imaging and neurologic studies	Independently analyzes advanced imaging and neurologic studies	
Comments:	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
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:				ssessable

		Level 3	Level 4	Level 5
Demonstrates knowledge of common batient 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 guides others in the disclosure of patient safety events
Demonstrates nowledge of basic quality improvement nethodologies and netrics	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

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

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 for the patient	Participates in advocacy activities for health policy	
Comments: Not Yet Completed Level 1					

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 C	ompleted Level 1	

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
Comments:			Not Yet C	ompleted Level 1

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 others' 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.

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates respect and establishes rapport with patients and patients' 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	Guides 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
Comments:	Comments: Not Yet Completed Level 1			

Interpersonal and Comm	unication Skills 2: Interpro	fessional and Team Comm	unication	
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 health care team members	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

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
Comments:			Not Yet C	completed Level 1