

SCIENTIFIC INVESTIGATIONS

## Sleep Medicine Milestones 2.0: designed for our field

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The Accreditation Council for Graduate Medical Education published the first sleep medicine milestones in 2015. However, these milestones were the same among all internal medicine fellowship programs; they were not specific to the specialty. Based on stakeholder feedback, the Accreditation Council for Graduate Medical Education called for the creation of specialty-specific milestones. Herein, we outline the history of Accreditation Council for Graduate Medical Education reporting milestones; the identification of knowledge, skills, and attitudes that define the practice of sleep medicine; and the creation of the supplemental guide and sleep medicine-specific milestones (Sleep Medicine Milestones 2.0) to assess developmental progression during fellowship training.

**Keywords:** competency-based education, fellowship, milestones, sleep medicine

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### BRIEF SUMMARY

**Current Knowledge/Study Rationale:** The Accreditation Council for Graduate Medical Education's initial reporting competency-based milestones for assessment of fellows performance for sleep medicine were not specialty-specific but rather the same milestones used by all internal medicine subspecialties. Sleep medicine-specific milestones can help programs customize assessment and feedback for sleep medicine fellows.

**Study Impact:** This article describes the development of Sleep Medicine Milestones 2.0, including changes from the initial set of milestones and the creation of the supplemental guide.

### INTRODUCTION

Graduating competent sleep medicine physicians from Accreditation Council for Graduate Medical Education (ACGME)-accredited fellowship programs is key to the ongoing growth and impact of our specialty. The ACGME established 6 core clinical competencies for residency and fellowship training: patient care (PC), medical knowledge (MK), systems-based practice (SBP), practice-based learning and improvement (PBLI), professionalism (PROF), and interpersonal and communication skills (ICS). However, assessment of the competencies was complicated by differing interpretations of specific competencies and heterogeneity of implementation across specialties. The Outcome Project was initiated in 2001, with a 10-year implementation plan that included the development and integration of the 6 competencies into residency training, the development and use of reliable trainee assessments for trainees, and the identification of exemplars for each competency. The Next Accreditation System, established in 2009, used milestone-driven assessment and improvement within the 6 competencies as the basis for program accreditation.<sup>1</sup>

To develop the initial subspecialty reporting milestones, representatives from 26 internal medicine specialty societies, including sleep medicine, identified individual subcompetencies and created developmental milestones. The ultimate decision was to write generic subcompetencies to be used by all internal medicine specialties. One disadvantage to this approach was that not all subcompetencies applied to every subspecialty.

In an effort to bridge the initial ACGME reporting milestones and sleep medicine fellowship training, the American Academy of Sleep Medicine's Sleep Medicine Fellowship Directors Council Steering Committee created sleep medicine-specific curricular milestones that mapped to the generic reporting milestones. For example, subcompetency PC-4a, "Demonstrates skill in performing and interpreting invasive procedures and/or testing," did not pertain to sleep medicine fellowship programs and thus was omitted from the academy's sleep medicine reporting milestones.

Although these sleep medicine-specific curricular milestones helped fellowship programs apply the developmental descriptions of the general competencies, they fell short in

embodying the essence of sleep medicine training. Additional concerns regarding the initial milestones included the complexity and wordiness of the milestones, the inconsistency of milestone progression within and between specialties, the lack of community engagement in the development of the milestones, and the lack of resources to assess progress in trainees. Therefore, new developmental milestones, Sleep Medicine Milestones 2.0 (Milestones 2.0), were created to reflect the knowledge, skills, and attitudes required of a sleep medicine physician and address the shortcomings of the first milestones.<sup>2,3</sup>

The 18 milestones in Milestones 2.0 continue to draw from the 6 core competencies. The milestones are to be used by each program’s Clinical Competency Committee (CCC) and by faculty and trainees. CCCs use the milestones for assessment, faculty use them to guide their own development as educators, and fellows use them to create individualized learning plans that facilitate self-reflection and measurement of individual progress compared with national trends.

**MILESTONE PROGRESSION**

Milestones 2.0 uses the Dreyfus and Dreyfus<sup>4</sup> 5-stage developmental model of mental activities for skill acquisition during the fellowship year: novice (level 1), advanced beginner (level 2), competent (level 3), proficient (level 4), and expert fellow (level 5). In Milestones 2.0, level 1 is a novice learner in the specialty of sleep medicine and level 5 is an expert learner, a notable difference from the first set of subspecialty reporting milestones, which ranged from “critical deficiencies” to “ready for unsupervised practice” and “aspirational.” This paradigm allows fellows in all accredited programs to achieve defined competencies in the management of adult and pediatric sleep disorders within the broader context of the health care system.

Key changes incorporated into Milestones 2.0 are summarized in **Table 1**.<sup>2</sup> The anchors applied to Milestones 2.0 differ from those used in the original reporting milestones. The

changes highlight a conscious decision to remove negative language (eg, “critical deficiency”) and implications about fitness for graduation (eg, “ready for unsupervised practice”). In addition, Milestones 2.0 includes a relative leftward shift of the associated anchors for each subcompetency: Level 3 is now considered proficient vs level 4, which is considered ready for unsupervised practice. As always, the determination about a fellow’s readiness for graduation lies with the program director, with advisement from the program’s CCC.

**NEW HARMONIZED MILESTONES FOR PBLI, PROF, ICS, AND SBP**

In the original reporting milestones, the non-PC and non-MK domain subcompetencies and associated developmental milestones differed across specialties. The second ACGME Milestones Summit in December 2016 included representatives from all ACGME core specialties who expressed concerns about the variable definitions of developmental progression and competency within the PBLI, PROF, ICS, and SBP domains.<sup>5</sup> An analysis by the ACGME Department of Milestone Development and Evaluation showed that the 26 core specialty milestones included 171 descriptions for PBLI, 230 for PROF, 176 for ICS, and 122 for SBP.<sup>6</sup> To address these inconsistencies, the ACGME assembled a working group to develop a set of harmonized milestones for these 4 domains. The harmonized milestones were posted for public review and comment in 2017.<sup>5</sup> The Sleep Medicine Milestones 2.0 Working Group (Working Group) incorporated the harmonized milestones with minor edits and customizations for sleep medicine fellowship training.

**DEVELOPMENT OF SLEEP MEDICINE MILESTONES 2.0**

In 2018, the ACGME Department of Milestone Development and Evaluation extended a call for volunteers to work on sleep medicine milestones and selected a group of 10 physician

**Table 1—Key changes incorporated into Sleep Medicine Milestones 2.0.**

Overall Change	Example
Removal of negative language	Level 1 is now “novice” instead of “critical deficiency” with option to also mark “not yet completed level 1” or “not yet assessable”
Changes to level 1–5 anchors	Novice, advanced beginner, competent, proficient, expert fellow
Sleep medicine–specific milestones	
PC	PC-2: Use of diagnostic tools in sleep medicine across the lifespan
MK	MK-2: therapeutic knowledge for sleep disorders
Harmonized milestones	
SBP	SBP-2: system navigation for patient-centered care
PBLI	PBLI-1: evidence-based and informed practice
PROF	PROF-3: self-awareness and help-seeking
ICS	ICS-1: patient- and family-centered communication

See Accreditation Council for Graduate Medical Education.<sup>2</sup> ICS = interpersonal and communication skills, MK = medical knowledge, PBLI = practice-based learning and improvement, PC = patient care, PROF = professionalism, SBP = systems-based practice.

volunteers from ACGME-accredited sleep fellowship programs. The group included program directors, attending physicians, sleep medicine fellows, and ACGME milestones staff. The Working Group gathered for 4 days in February and May 2019 at the ACGME headquarters in Chicago, Illinois, to develop Milestones 2.0.

Both sleep medicine-specific and harmonized milestones were written to address a sleep medicine-specific learning environment. Review of the initial reporting milestones resulted in 1 or 2 subcompetencies being dropped from every core competency domain except for ICS, which was increased from 2 to 3 subcompetencies. The harmonized milestones encompassed skills related to patient-centered care delivery, diversity and inclusion, working within a team structure, and navigating large, complex health care systems. The Working Group focused on progressive stages of learner growth, defining points along the trajectory from a novice learner to an innovator and a leader in the field of sleep medicine.

The Working Group identified key knowledge, skills, and attitudes that future sleep medicine specialists need upon graduation from fellowship. The revised PC subcompetencies indicate that the observable behavior should be shown when the fellow works with patients “across the lifespan” to reflect that sleep medicine fellowship training encompasses pediatric and adult populations. To ensure that Milestones 2.0 remains applicable as new technologies are incorporated into sleep medicine practice, milestones related to diagnosis and management of sleep disorders do not specify procedures or treatment modalities.

The Working Group was divided into 6 subgroups, each assigned to a core competency domain to update Milestones 2.0 to fit within the new learner-based model of competence (ie, a novice learner to an expert learner of sleep medicine). The entire group reviewed and modified each subgroup’s recommendations until the full group reached consensus.

## PC

The PC competency domain is divided into 4 subcompetencies. PC-1 focuses on information collection and synthesis, PC-2 concerns the ability to choose appropriate diagnostic tools, PC-3 regards the interpretation of physiologic testing, and PC-4 involves the development of management plans for patients with sleep disorders. The PC milestones progress from level 1 through level 5 as the complexity of clinical scenarios and testing interpretation increases.

## MK

There are 2 MK subcompetencies. MK-1 highlights the application of the knowledge of physiology and pathophysiology of sleep-wake disorders to clinical care. MK-2 assesses the knowledge of therapeutics to treat sleep-wake disorders. Both MK subcompetencies progress from a basic knowledge of common sleep disorders and treatments to familiarity with uncommon and complex sleep disorders and treatment modalities that are emerging or are less often used.

## SBP

The SBP competency domain contains 3 subcompetencies. SBP-1 focuses on patient safety and quality improvement, including disclosing patient safety events to patients and

families and participating in quality improvement projects. SBP-2 concerns system navigation for patient-centered care, including interdisciplinary team interactions and the coordination of patient care among various disciplines and specialties. SBP-3 involves the fellow’s role in the health care system to improve care delivery and health systems performance, including analyzing individual practice patterns and professional requirements in preparation for practice. Learners progress from novice learner to expert learner as they are able to successfully navigate increasingly complex systems.

## PBLI

The PBLI competency domain is divided into 2 subcompetencies. PBLI-1 focuses on incorporating evidence and patient values in the care of patients with sleep disorders, with different levels achieved as situational complexity increases. PBLI-2 is about the fellow’s self-reflective practices and commitment to personal growth. The PBLI-2 trajectory encompasses openness to performance feedback and the implementation of learning plans with increasing levels of independence.

## PROF

There are 3 PROF subcompetencies. PROF-1 assesses professional and ethical behavior, including identifying professional lapses, taking responsibility for identified lapses, and using appropriate sources for managing and resolving ethical dilemmas. PROF-2 focuses on accountability and conscientiousness, moving from taking responsibility for completing simple tasks to proactively implementing strategies for timely task completion and systems-level improvement. PROF-3 centers on well-being and help-seeking; progression from level 1 to level 5 occurs with growth from personal awareness to coaching others to optimize their professional well-being.

## ICS

The ICS competency domain is divided into 4 subcompetencies. ICS-1 focuses on patient and family-centered communication. Early levels show effective communication with patients and families in simple encounters, with progression to higher levels of competency as shown by effective communication during more complex encounters. ICS-2 assesses the fellow’s growth from identification of barriers and bias (novice learner) to reflection on personal bias and implementation of measures to mitigate bias (expert learner). ICS-3 focuses on interprofessional and team communication in straightforward and complex situations, along with the fellow’s receptiveness to feedback as a member of the health care team. ICS-4 emphasizes communication within health care systems and the accuracy and timeliness of recordkeeping.

## ASSESSMENT TOOLS TO USE WITH MILESTONES 2.0

The sleep medicine-specific PC and MK milestones can be assessed with direct observation, medical record audit, multi-source feedback, simulation, and sleep in-service examinations. Potential assessments for the harmonized milestones include direct observation, medical chart audit, multisource feedback, individual learning plans, and quality metrics. Other strategies

may include group interviews and discussions for team activities, institutional online training modules, participation in institutional well-being programs, personal wellness plans, and self-assessment. Assessment tools and their relationship to each competency domain are summarized in **Table S1** in the supplemental material.<sup>7</sup> Programs are encouraged to develop and implement innovative assessment strategies to inform their use of Milestones 2.0. Optimally, each subcompetency should be evaluated by multiple assessment tools and assessors; however, we recognize that this is not always feasible.

## DEVELOPMENT, CONTENT, AND APPLICATION OF THE SUPPLEMENTAL GUIDE

To facilitate the transition to Milestones 2.0, the Working Group created a supplemental guide with examples of validated behaviors for each milestone and potential assessment methods to use for each competency.<sup>7</sup> For instance, the National Library of Medicine PubMed tutorial may be a useful resource for trainees to learn how to efficiently access available literature, which is part of the PBLI-1 subcompetency. The supplemental guide orients assessors and presents illustrative examples but does not provide an exhaustive list of examples or resources. The ACGME website provides additional tools to help programs implement Milestones 2.0 and hosts faculty development sessions created to improve faculty proficiency with assessment (<https://www.acgme.org>).

The supplemental guide describes 5 aspects of each subcompetency: (1) the title and intent, to clarify its purpose; (2) concrete, level-specific examples for each milestone; (3) potential assessment models and tools that can be used for assessment; (4) a space for programs to map their curriculum to the milestone to improve the program's efficiency of assessment; and (5) resources that can be used by programs and fellows to help fellows progress through the milestones. Each assessor will need to consider the complexity of patients seen and managed by a fellow when incorporating Milestones 2.0 into fellow assessment. The flexible curriculum mapping framework helps the program identify components and rotations of the curriculum during which each subcompetency can be assessed. This map can also be useful for fellows to know which milestones are meant to be achieved under a given part of the training program.

## CONCLUSIONS

Milestones 2.0 represents the next phase of the competency-based assessment of sleep medicine fellow performance. We recommend that programs thoroughly review their current curriculum and assessment tools, Milestones 2.0, and the supplemental guide to identify current assessment tools compatible with the new milestones and develop new tools when necessary. Milestones 2.0 is published in an editable document format so that programs can modify and tailor according to their individual program and uses of the supplemental guide.

Recommended next steps for programs are to (1) map the curriculum and existing assessment tools to Milestones 2.0,

(2) develop new assessment tools to fill identified voids, (3) convene the CCC to build a shared framework for each subcompetency growth level and document the committee's decisions, and (4) implement faculty development regarding assessment to ensure that all faculty consistently assess fellows in a manner that aligns with the program's goals.

Fellows need timely feedback, informal and formal, so that they can build upon this information and advance in their training. Faculty are encouraged to provide frequent feedback during all experiences and rotations in the training program. In addition, the CCC should provide at least semiannual but ideally quarterly feedback to fellows about their progress through the milestones. Furthermore, Milestones 2.0 can be a valuable self-assessment framework for fellows to enhance their personal and professional growth during their training.

As the field of sleep medicine advances, the milestones will evolve with input from stakeholders; there is a plan to review and revise the milestones in 7 to 10 years. This iterative process of milestone development and revision will help ensure that sleep medicine fellow assessment remains current and aligned with the knowledge, skills, and attitudes needed by sleep medicine specialists.

## ABBREVIATIONS

ACGME, Accreditation Council for Graduate Medical Education  
 CCC, Clinical Competency Committee  
 ICS, interpersonal and communication skills  
 Milestones 2.0, Sleep Medicine Milestones 2.0  
 MK, medical knowledge  
 PBLI, practice-based learning and improvement  
 PC, patient care  
 PROF, professionalism  
 SBP, systems-based practice  
 Working Group, Sleep Medicine Milestones 2.0 Working Group

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