

## REVIEW

# Competency-based medical education in the United States: What the otolaryngologist needs to know

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## Abstract

Competency-based medical education (CBME) is an outcomes-focused approach to educating medical professionals that will be central to future efforts to improve resident training in otolaryngology. The transition to CBME for otolaryngology in the United States will require the development of specialty-specific assessments and benchmarks, the financial and administrative support for implementation, the professional development of faculty and learners, and the cooperation of all major stakeholders in graduate medical education. In this article, we describe the need for evidence-based innovation in surgical training, the history of CBME in the United States, and the progress towards defining “entrustable professional activities” as the building blocks of assessments for CBME. We explore what such a paradigm shift in surgical education could mean for academic otolaryngologists by examining innovative educational practices in other surgical specialties and discussing foreseeable challenges in implementation for the American healthcare system.

## KEYWORDS

entrustable professional activities, residency training, surgical education, workplace-based assessments

## 1 | WHAT IS COMPETENCY-BASED MEDICAL EDUCATION?

In the era of evidence-based medicine, competency-based medical education (CBME) sits at the intersection of graduate medical education (GME) and health systems science as an outcomes-centered approach to training physicians. Over the past 30 years, surgical education in the United States has shifted from unstandardized, time-based apprenticeship models to more standardized frameworks to improve the overall quality of training. In 1999, the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties (ABMS) canonized six Core

Competencies as an early framework for CBME in postgraduate medical training. The competencies (Patient Care, Medical Knowledge, Professionalism, Interpersonal and Communication Skills, Practice-Based Learning and Improvement, and Systems-Based Practice) laid the groundwork for the development of specialty-specific Milestones to rate trainees' progress towards attaining competency. Since then, many specialties have revised their original Milestones, including otolaryngology, which published Milestones 2.0 in July 2022.<sup>1</sup>

The pressing need for CBME has been well-established across specialties in the medical education literature.<sup>2,3</sup> There are many modern challenges to training in otolaryngology that have rendered CBME more important and relevant for our field than ever before.

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Some challenges have been foreseeable, such as trends towards subspecialization, rapid innovations in medical/surgical treatments, and the expansion of ambulatory surgery centers that have made it increasingly difficult for residents to receive exposure to the full breadth of otolaryngology during training.<sup>4,5</sup> Other challenges have been unpredictable, like the COVID-19 pandemic that derailed training schedules, exposing how a time-spent model of training might not be adequate to indicate readiness for independent practice.<sup>6</sup>

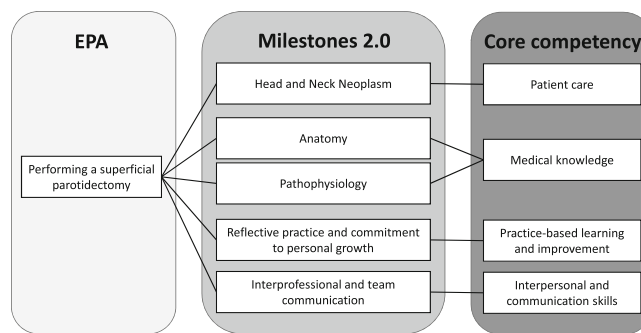
A major barrier to the measurement of existing ACME Competencies and Milestones has been the difficulty in mapping these ideas to the everyday activities of trainees.<sup>7</sup> Most academic surgical faculty struggle to apply these complex frameworks to assessments and feedback while teaching residents. As such, a more practical concept has emerged in medical education that links broader competencies to everyday clinical practices: entrustable professional activities (EPAs).

## 2 | WHAT ARE ENTRUSTABLE PROFESSIONAL ACTIVITIES?

Although competencies are broad descriptions of the qualities of physicians and milestones are stages in the development of these competencies, EPAs describe essential clinical tasks that physicians perform, framing competencies in the context of discrete clinical activities.<sup>8</sup> Mastering a single EPA usually requires skills from multiple Competencies: Figure 1 shows an example of how a hypothetical otolaryngology EPA could be mapped back to ACGME Milestones and Core Competencies. In comparison to the broader Competencies and Milestones outlined by the ACGME, EPAs represent a complementary framework to link the abstract Competencies and Milestones to the actual work that physicians perform.<sup>8</sup> They also represent measurable outcomes that can inform decisions for progression, annual promotion, graduation, and certification. As a resident demonstrates mastery of an EPA, clinical supervisors can entrust the resident to perform that task with increasing autonomy. EPAs therefore provide a concrete framework for residents to transition from supervised activities to autonomous practice.

## 3 | WHAT ARE THE NEXT STEPS FOR IMPLEMENTING CBME IN OTOLARYNGOLOGY?

In the United States, there is increasing interest in building comparable frameworks for CBME using EPAs that would reflect the practices of American physicians and the needs of the patients served.<sup>4</sup> Although otolaryngology in the United States has yet to formalize its strategy for competency-based surgical training, colleagues in other procedural subspecialties are moving forward. The American Board of General Surgery is launching the assessment of EPAs in July, 2023 as a requirement for all programs and for board eligibility.<sup>9</sup> Emergency medicine has designed EPAs for multicenter pilots, funded by a \$1.25 million dollar grant from the American Medical Association.<sup>10</sup> In the field of plastic surgery, a small



**FIGURE 1** Mapping a hypothetical EPA for otolaryngology onto ACGME core competencies and Milestones 2.0 sub-competencies. ACGME, Accreditation Council for Graduate Medical Education; EPA, entrustable professional activity.

number of residency programs have formed the Consortium for Competency-Based Plastic Surgery Training<sup>11</sup>; these programs have implemented a flexible, competency-based training curriculum, informed by custom evaluation tools to assess operative entrustability.<sup>12</sup> Although these procedural specialties in the United States have begun to transition to competency based surgical training, most efforts are in their infancy and detailed investigations into their successes and challenges have not yet been conducted.

Internationally, some countries are more advanced in their exploration of competency-based training. In Canada, EPAs have been used to assess otolaryngology residents since 2017 and some surgical specialties such as orthopedic surgery have even progressed to time-variable models of training.<sup>13</sup> In the Netherlands, CBME with variable-length training has been the norm since 2014 across all specialties.<sup>14</sup> Pilot programs for otolaryngology EPAs have also been conducted in other countries with diverse patient needs, from India<sup>15</sup> to Australia.<sup>16</sup>

In the United States, each specialty will forge its own unique path towards CBME. Drawing from the experiences of colleagues in other specialties and countries further along in their transitions to CBME, a number of key next steps necessary to move towards implementation can be identified for the field of otolaryngology:

### 3.1 | Designing EPAs

Most specialties arrived at their EPAs using working groups with leaders and representatives in the field using rigorous consensus methods such as the Delphi technique.<sup>17,18</sup> Amendments were then made by a range of other stakeholders in GME participating in writing groups to define the scales and scopes of each EPA. In Canada, otolaryngology was one of the first specialties to adopt competency-based education in 2017 as part of the Royal College's "Competency by Design" initiative. Their curriculum presently includes 34 EPAs across four phases of training: *Transition to Discipline*, *Foundations of Discipline*, *Core of Discipline*, and *Transition to Practice*. The EPAs were designed to be developmental, progressing from smaller tasks (e.g., performing a head and neck history and exam during *Transition to Discipline*) to more complex collections of

activities (e.g., participating in and/or leading educational or administrative activities in *Transition to Practice*).<sup>13</sup>

More recently, however, learning experts have determined that a large number of EPAs can be burdensome for residents and faculty to track and postulated that there should be only around 15–20 core EPAs for each specialty.<sup>8,19,20</sup> In the United States, general surgery has identified 18 EPAs that represent the “floor” of the discipline, defining the minimum criteria by which to assess readiness for general surgical practice.<sup>9</sup> Learning from our colleagues, otolaryngology in the United States can use EPAs to define what is core to the specialty and to track trainee advancement towards independent practice.

### 3.2 | Supporting faculty development

CBME represents a significant shift from the traditional time-based medical education, placing an emphasis on the ability of faculty to fairly and accurately assess residents on their performance.<sup>21</sup> Faculty members will need a strong foundational understanding of the goals and principles of CBME to effectively provide repeated, criterion-based assessments with formative feedback for trainees rather than end-of-rotation summative impressions.<sup>22</sup> Although this will require investment in faculty development, this also represents an opportunity for programs to educate faculty, sharpen their abilities as surgical teachers, and involve them in program improvement efforts.<sup>21</sup>

### 3.3 | Using assessments to inform flexible transitions in training

As CBME allows programs to capture data about the progression of trainees towards competency, it may enable time-variable training. This has been demonstrated by orthopedic surgery training programs in Canada where pilot CBME initiatives reduced the 5 years of training down to 4 for the majority of participating residents.<sup>23</sup> Aside from its potential to shorten the overall length of training, capturing more data about the progress of trainees may enable program directors or clinical competency committees to create more individualized learning plans for residents with different learning goals and needs.<sup>24</sup> For example, a resident struggling with endoscopic sinus surgery might be granted additional time to bolster those skills, while a resident demonstrating proficiency at an accelerated pace may craft an advanced capstone rotation in their future area of practice.

### 3.4 | Investing in continuous program improvement

After the successful launch of any CBME initiative in otolaryngology training, thoughtful program evaluation and continuous improvement strategies must be adopted. Using principles of implementation science, the impact of these educational interventions must be studied from the perspectives of all stakeholders including faculty, residents,

other hospital staff, and patients. For example, assessments must be monitored for biases, including gender bias.<sup>25</sup> This represents an opportunity for continuous program improvement, incrementally improving the processes of training over time with the goal of producing competent otolaryngologists that can serve their intended patient populations.

## 4 | WHAT ARE SOME OF THE FORESEEABLE CHALLENGES OF CBME?

Based on the experiences of colleagues in other fields that are transitioning to competency-based training, a number of challenges may arise during the implementation of CBME for otolaryngology in the United States:

### 4.1 | Administrative burden of assessments

Assessing trainees on EPAs can require considerable time and effort from both faculty and trainees. This burden could be lessened by use of electronic assessment tools that may also automate reporting and data analytics. Canadian programs have partnered with various technological vendors to collect and organize assessment data.<sup>23</sup> The American Board of Surgery will be using a smartphone application to streamline data collection and analysis.<sup>9</sup> Learning management systems can be built around such platforms to collect assessments, consolidate feedback and provide direct teaching (e.g., with videos or articles). Combining learning management systems with artificial intelligence may even 1 day generate automated suggestions for individualized learning plans for otolaryngology residents.<sup>26</sup>

### 4.2 | Workforce instability with time-variable training

If CBME leads to flexibility in the duration of training or even simply the duration of resident rotations, this can create instability in the resident workforce. For example, some residents may qualify to finish a rotation early, leaving an unfilled position in the workforce, while other residents may require additional time as they cannot demonstrate competency. Similarly, select residents might even demonstrate competence early and be deemed board-eligible prior to the end of the traditional 5 years of training, resulting in an unstable workforce among senior residents. This may require significant dedication and creativity from departments and sponsoring institutions to accommodate this flexibility by recruiting other types of healthcare providers (e.g., advanced practice providers) or administrative staff to support the work of residents. Rising to this challenge may, however, improve the overall resiliency of the medical workforce. In the Netherlands, the implementation of CBME enabled many residents to work as part time employees, giving them flexibility for family planning or other personal needs.<sup>27</sup> Innovations in learning analytics could also 1 day

use predictive models to help programs anticipate training needs and improve workforce planning.<sup>28</sup>

### 4.3 | Funding for CBME

It may prove challenging to financially support CBME implementation and evaluation in the United States. The funding mechanisms for GME in the United States are complex and many of the payments from governmental sources (e.g., Medicare) are directly tied to a time-based model of training.<sup>29</sup> In addition, the administrative costs of CBME alone may be substantial, compounded by the costs of ongoing faculty development and programmatic review.<sup>23</sup> Innovative ideas have been proposed for residents who shorten their training by demonstrating competency early; 1 day, select residents may attain early board eligibility and be permitted to practice and/or bill independently at their training institutions.<sup>24</sup> These practices might provide alternative sources of revenue to support educational efforts at sponsoring institutions. Communication and collaboration must occur between major regulatory boards including the ACGME, specialty boards, state medical boards, hospital privileging boards, and major funders of GME for this transition to be successful.<sup>30</sup>

## 5 | CONCLUSION

Although the road to competency-based surgical training in otolaryngology may be long in the United States, our field must begin to use data and implementation science to improve the outcomes of surgical training. Viewing the potential of competency-based medical education through the lens of health systems science and recognizing its implications for patient safety and quality of care, CBME is the future of graduate medical education. The development of novel assessments like EPAs as the working unit of CBME will be an opportunity to measure the outcomes of training and incrementally improve the way that otolaryngologists are trained using evidence. Although there are significant challenges in the design and implementation of CBME for otolaryngology in the United States, these are accompanied by even greater opportunities for innovation.

### CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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**How to cite this article:** Chen JX, Thorne MC, Galaiya D, Campisi P, Gray ST. Competency-based medical education in the United States: What the otolaryngologist needs to know. *Laryngoscope Investigative Otolaryngology.* 2023;8(4):827-831. doi:[10.1002/lio2.1095](https://doi.org/10.1002/lio2.1095)