

Time Well Spent: Resident Promotion of Microcompetency-Based Medical Education During Inpatient Pediatric Experiences

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It is March and a new group of medical students have matched into our residency, but as a current resident, my role remains fixed. I am the senior resident on an inpatient pediatrics night rotation, charged with supervising Jack, a pediatric intern. Over the first few nights of the rotation, I directly observed Jack as he performed several complete history and physical examinations. He was thorough and demonstrated excellent communication with families. Afterward, he explained his medical reasoning to me, and it was clear that he had a strong knowledge base and sound medical reasoning. I checked all his orders and found them to be accurate. I listened as he communicated thoughtfully and collaboratively with nurses and consultants. Over the next few nights together, I started to pull back supervision. He saw newly admitted patients first and then presented his assessments and plans to me. I checked only error-prone orders. It became clear that he had mastered many key intern-year competencies. I found myself thinking that he was ready to start working on the competencies associated with being a supervising resident. However, Jack and I were stuck in a time-constrained medical education environment.

In the current model of medical education, learners advance through training based on time—4 years of medical school, 3 years of residency, then independent practice or fellowship. Recently, competency-based medical education (CBME) has been suggested as a promising model in which the advancement of learners depends on their ability to demonstrate competency in predetermined areas rather than on historically determined time intervals, because time in training does not ensure competency.^{1,2} The call for CBME originates from the premise that physicians must be able to competently address the health needs of their patients.^{1,3} In this model, Jack could advance based on his skillset, becoming a supervising resident before the end of his intern year.

CBME poses many logistical challenges. First, residents and fellows constitute a large portion of the clinical workforce and it would be daunting to accommodate a shifting number of trainees at a given stage of training.⁴ Additionally, CBME requires direct longitudinal faculty observation of trainees and faculty training in assigning competencies, both of which assume the availability of faculty members, many of whom have competing responsibilities.^{1,5-7} Even if the challenges that are local to an individual program are ad-

ressed, medical schools and residencies must meet the mandates of their umbrella organizations, including the Liaison Committee on Medical Education, state medical boards, the National Resident Matching Program, the Accreditation Council for Graduate Medical Education, and professional specialty boards, each of which has its own timeline.⁸

Although CBME is currently being piloted in a number of avenues, including through the Association of American Medical Colleges Education in Pediatrics Across the Continuum project, and we eagerly anticipate best practices in CBME, we propose the concept of resident-based micro-CBME, a way of rapidly incorporating key features of CBME into an inpatient pediatric rotation spearheaded by supervising residents.⁹ Micro-CBME is a model wherein supervising residents serially observe interns and medical students, offer coaching, and expand or contract responsibilities based on competencies. Supervising residents are well positioned for this role as they frequently directly observe interns and medical students. Supervisors are present on rounds, in the workroom when an intern poses a consult question, standing nearby when a nurse asks him to interpret vital sign changes, listening as he signs out the service to the night team, or observing him providing anticipatory guidance to a family before discharge. These data are everywhere, and it is time we use them.

Given that Jack had mastered key intern-level competencies, on the final night of the rotation, we decided that he would be the supervisor, and I would complete the intern-level tasks—our initial experiment in micro-CBME. That night, we focused on the roles of the supervisor. He would scan the vitals for our entire census, prepare a written handoff document for the day team, and decide when to pipe up when the nurses asked me, the intern, questions. He was being pushed to his zone of proximal development, or the “distance between what a learner has mastered and an incremental new level of proficiency,” a space in which learners are best challenged to advance their skillsets.^{10,11}

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CBME Competency-based medical education

Soon after, another supervising resident (BH) was paired with Jack on a daytime inpatient pediatrics rotation. After reconfirming that Jack had developed mastery of skills expected of interns through repetitive direct observation, BH modified the learning objectives of the rotation—Jack would now focus on developing resident-level team management skills, including knowing the clinical details of all patients on the floor, communicating with the interdisciplinary team about patient needs, and leading the team through interdisciplinary family-centered rounds, and BH took over traditional intern tasks. In our current time-based model, the management skills Jack developed are expected to miraculously emerge over the night of June 30 before the calendar turns to July 1. With micro-CBME, Jack was able to start his new academic year primed to succeed in team leadership.

There are other avenues in which micro-CBME may be implemented. A medical student rotating through her core clerkship may take on roles typically assigned to subinterns, if her supervising resident has determined that she has mastered the competencies of a clerkship student. If an intern has not yet mastered the entrustable professional activities for graduating medical students or struggles to care for her patient panel, the supervising resident may assume some of the intern's responsibilities while simultaneously coaching the intern to facilitate competency development.¹² Medical student and intern progress would be shared directly with medical student clerkship directors and residency program directors to further inform individualized learning plans.

There are existing examples of residents receiving graduated autonomy in the literature under the guidance of attending physicians.^{13,14} Of note, mismatches between autonomy expected by residents and granted in actuality by attendings has been shown to occur.¹⁵ We believe that supervising residents, who recently were themselves medical students and interns, may have unique and valuable insight into the competencies of their junior colleagues. Micro-CBME overcomes one of the major challenges of CBME as frequent direct observation is built into supervisor-supervisee interactions by virtue of the supervisory rotation structure. Similar to CBME, competencies still must be clearly defined, but once done, education around their determination could be completed at residency retreats, a potentially easier task than corralling a large faculty body from many departments. An additional benefit of micro-CBME is that, because acceleration is limited by the structure of existing rotations and because it is not a model that seeks to advance time to graduation, there are fewer logistical concerns.

However, micro-CBME is not without challenges. As senior residents, we could have misjudged the intern's capabilities or reinforced bad practices. Thankfully, we had

close faculty mentorship by our associate program director throughout. The success of the micro-CBME model will depend on engaged faculty advisors, who must be aware and in agreement with acceleration or remediation within a given rotation. In this model, there is risk that a strong learner would become stronger, further separating him from a struggling peer. Program leaders would need to be attuned to emerging hubris or humiliation as trainees advance at variable rates. For example, program leaders should discuss progress in rotations completed to date with trainees as a standard part of their individualized learning plan reviews and gain a sense from trainees of how the experience of variable-acceleration has impacted their personal learning trajectories. If implemented correctly, this model would be practiced in such a way as to ensure psychological safety, that is, areas of weakness are addressed by supervisors and program leadership with attention and care. Additionally, demonstration of competence on 1 rotation (eg, general pediatrics) may not translate into competence on another rotation (eg, newborn nursery) and senior residents would need to assess competencies anew at the start of each rotation. Finally, careful attention must be paid as to whether there is gender disparity in learner advancement, because prior literature has demonstrated that female residents are less likely to be described with competency-based descriptors than male residents in resident assessments.¹⁶

We have described the micro-CBME model based on our own collective experience. Next steps are to translate our experience with micro-CBME into a generalizable model, including (1) partnering across institutions to agree on pediatric rotation competencies, (2) designing curricula for rigorous training programs for senior residents on how best to assign competencies, and (3) performing a multi-institutional study to measure the extent to which a trainee's experience is individualized in the micro-CBME model as compared with the time-based model.

We hypothesize that micro-CBME will provide trainees with an opportunity to emerge from training at their highest level of competency, allowing them to provide autonomous and high-quality care to patients after graduation—in other words, to truly maximize their training time. ■

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