

## Principles of Electronic Evaluations in Competency-Based Medical Education

Competency-based medical education (CBME) continues to be embraced throughout the world.

In CBME, Entrustable Professional Activities (EPAs) are a common framework for teaching and meaningfully assessing a candidate's competence while embedded in a clinical context. EPAs attempt to classify and describe all key competencies that a candidate must successfully integrate in care delivery before being considered a full-service, competent physician. Once a candidate is considered entrustable, the individual is ready to perform the activity without direct supervision.

While adopting CBME and EPAs, Program Directors and faculty need to rethink the electronic field note, evaluation tools, and faculty-candidate communication to account for this new mapping of domains, competencies, and milestones.

According to The College of Family Physicians Canada, successful evaluations in CBME are:

**Valid**, meaning indeed indicative of competence in the domain of tasks for the discipline in question

**Reliable**, meaning consistent in the measurement and distinction between competence and non-competence

**Cost-effective** in time, money, and attention

**Acceptable**, meaning pertinent, rigorous, and fair to both candidates and evaluators

**Positive in their effect on learning**, driving learning toward true competence rather than toward simply passing an exam

An electronic evaluation tool in a CBME context should align with these characteristics and enhance the candidate's progress toward competence. From experience with our clients, we have distilled a list of principles to consider when designing an electronic evaluation tool for competency-based medical education.

### Evaluations Should Facilitate Immediate Faculty-Student Communication

We often hear Program Directors asking these questions: How do we help candidates and evaluators talk with each other? How do we improve feedback? How do we make sure the learning is optimized in that process?

Residents are hungry for feedback. The more a program can promote rich and useful feedback, the better the learning will be. A mobile electronic solution with the capacity for immediate, on-the-spot evaluations facilitates just this.

While an activity is still top of mind, a candidate can submit a self-evaluation through a mobile device which can immediately be received and reviewed by a preceptor. Differences in the candidate's self-evaluation and the preceptor's evaluation can prompt meaningful questions and discussions immediately post-activity, and result in clear, mutual understanding. This opportunity is much harder to replicate when the evaluation is not immediately performed.

### A Good Assessment Tool Doesn't Just Document, It Guides

Field notes and evaluation tools exist, in part, to ensure preceptors and residents achieve a program's desired outcomes. Unfortunately, Program Directors often have to hope and assume that a combination of comments, feedback, and observations over the course of a training period will hit all of the required learning elements.

But good assessment doesn't assume.

Good assessment requires that the evaluators and candidates understand what the goals and criteria of competence are. A good evaluation tool can nudge and guide them toward those goals, and inform them of how to target and adjust for

them. The tool should guide both parties to understand what good feedback looks like. Any EPA-specific field note and evaluation solution in CBME should complement the educational process, indicating what competency means and to what degree it needs to be demonstrated. Features such as number scales or narrative descriptors embedded in the tool can achieve this.

## EPA-Specific Evaluations Should Highlight Learning Gaps

The first part of the electronic evaluation process is inputting data. The second part is getting a picture of that data's meaning.

The full picture of competence is like a completed puzzle made up of very structured EPA pieces. Within the electronic evaluation platform, a student should be able to see whether she is getting all the pieces of that puzzle, and which pieces remain missing and to what degree. A software tool with granular data management of the puzzle pieces can promote this. A resident, sitting down to look at his EPA field notes, should be able to find and organize his data quickly, and visually identify any gaps. The learner should, afterward, be able to address the questions: 'Where have I not demonstrated that I've mastered this particular EPA? Where am I stalled in my progress?'

Residents should be able to easily access their data, filter it, and understand which activities they may want to have observed and be given feedback on. Program Directors can use the data to evaluate the bigger picture of how the program is progressing across all sites and all EPAs. Preceptors can see which residents they're about to work with and determine which gaps they would like to fill during their time together.

## The Tool Considers the Unique Experiences of Learners

In a week, one resident may do surgery for four and a half clinical shifts and family medicine for a half day. Another resident may do two mornings of surgery, two of internal medicine, two of family practice, and one afternoon elective in addictions.

Students' learning experiences are diverse and opportunistic across different sites. Using a well-designed data management experience, residents can plot out in advance which EPAs they are most likely to work on, and where they are most likely to have the experiences that would give evidence of accomplishing and getting more proficient in those tasks.

## The Tool is Designed to Maintain the Integrity of Your Data

Guidance within the tool is important to ensure activities are not chosen randomly or mistakenly. People are going to use this data to make decisions. It has to be accurate.

One solution to this is a text-based educational function within the application, so if a resident is unsure what the *Collaborator* role means, for instance, she can quickly, intuitively, and painlessly access an indication of the meaning, and make an informed submission.

## The Tool Facilitates Faculty Buy-In through Frictionless Design

A common concern from preceptors regarding any new tool or process is how they will wrench it into their already-busy lives. Preceptors' time is precious and their goodwill, invaluable. Program Directors are rightfully hesitant to spend it.

A busy preceptor has finite patience for an evaluation, and any friction in an electronic process may cause frustration. To avoid that frustration and spur adoption, the solution has to be fast and undeniably beneficial. Well-designed features with intuitive navigation requiring minimal cognitive load are optimal. The more these intuitive features can induce easy, spontaneous, and serendipitous communication among candidates and faculty, the more likely the tool is to be adopted.

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