From workplace-based assessment to programmatic assessment: continuing the evolution of medical assessment to support competency-based medical education

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Introduction

In our article on workplace-based assessment (WBA), we outlined how WBAs represent an important step in the evolution of medical education assessment.[1] By focusing on real-time evaluation and providing formative feedback, WBAs allow learners to refine their clinical performance in actual patient-care settings. However, WBAs alone—similar to any single assessment method—have limitations. As van der Vleuten[2] noted, no single assessment method can comprehensively meet all quality criteria, such as reliability, validity, educational impact, and cost. Reliance on a single approach limits the breadth of information that can be gathered about a learner's abilities, much like relying on a single laboratory test to diagnose a complex medical condition.

Programmatic assessment overcomes these limitations by combining multiple assessment methods in a complementary fashion to provide a more comprehensive and accurate evaluation of learner competence.[3,4] This approach—a cornerstone of competency-based medical education (CBME)—offers a more holistic and continuous form of assessment.[5] In this article, we discuss the rationale behind the shift from traditional assessments to programmatic assessment, the principles that underlie this model, and how it can be successfully implemented in postgraduate medical training programmes.

Limitations of traditional assessment

Traditional assessments often rely heavily on high-stakes examinations at the end of a course or programme. Although these examinations serve a purpose, they fail to fully support the development of clinical competence as required in CBME.[5] High-stakes examinations typically induce anxiety, promote short-term memorisation, and do not capture the complexities of real-world clinical decision-making. When examinations are regarded as make-or-break moments, learners often shift their focus from genuine understanding to mere performance, which does not support long-term mastery.[6]

Several specific limitations of traditional assessments include:

- Overemphasis on passing examinations: High-stakes examinations create an environment in which learners prioritise passing the test over truly understanding the material. This approach is akin to relying on a single test result to make a clinical diagnosis without considering the broader clinical picture.[7]
- False sense of mastery: Passing an examination does not equate to mastery of clinical skills. Much like a normal test result does not guarantee a patient's overall health, passing an examination does not ensure that learners can effectively apply their knowledge in practice.[6]
- Failure to transfer learning: Traditional examinations often fail to ensure that learners can transfer theoretical knowledge into practice. It is one thing to memorise drug dosages; it is another to understand how to administer them properly, considering individual patient variables and clinical context.[8]
- Limited evaluation of core competencies: Communication, teamwork, professionalism, and other essential competencies in medical practice are not easily measured in traditional examinations. These competencies require ongoing evaluation in actual clinical environments, where learners can receive feedback and improve over time.[8]
- Lack of constructive feedback: Traditional assessments often provide limited or no feedback, depriving learners of the opportunity to understand their mistakes and improve. This is akin to treating a patient without explaining the diagnosis, prognosis, or the rationale behind the treatment plan.[8]
- Discouragement of self-directed learning:

Traditional examinations focus on predefined content and leave little room for learners to explore areas of personal or professional growth. Self-directed learning is a cornerstone of lifelong learning in medicine, and traditional assessments offer little encouragement for this essential skill.[8,9]

Programmatic assessment is designed to address these shortcomings. By incorporating multiple data points and reducing reliance on any single examination, it provides a more nuanced and comprehensive evaluation of learners' progression and competencies.

Core principles of programmatic assessment

Programmatic assessment is based on a set of principles derived from educational theories[10] that promote a comprehensive, learner-centred approach to medical education (Fig[4]):

1. "*Every assessment is but a data point, which should be optimised for learning by giving meaningful feedback to the learner. Pass/fail decisions are not given on a single data-point.*"[4]
   No single assessment can reliably determine a learner's progression. In programmatic assessment, each assessment—whether formative or summative—contributes to a cumulative understanding of the learner's abilities. This is similar to using multiple diagnostic tools to form a complete clinical picture. Overall judgement of the learner's competence is made by aggregating these data points over time. At this stage, the focus is on providing meaningful feedback to facilitate learning.[4]
2. "*Use a mix of assessment methods; the choice of method depends on the educational justification for using that method.*"[4]
   Competence in medical practice is multidimensional, and different assessment methods capture distinct facets of a learner's development. Programmatic assessment uses a mix of standardised tests (such as multiple-choice examinations or objective structured clinical examinations [OSCEs]) and non-standardised methods (such as narrative feedback or direct observation during WBAs). This approach mirrors clinical practice, where a combination of laboratory tests, imaging, and clinical examinations provides a comprehensive understanding of a patient's condition.[4]

   For standardised assessments, it is important to recognise that competence is content-specific—a learner's performance in one scenario or question may not reliably predict performance in another. Thus, standardised assessments require large samples of data to ensure reliability. This applies equally to objective tests (eg, multiple-choice questions) and more subjective assessments, such as oral examinations. Broad sampling of questions and examiners enhances validity. Additionally, quality assurance measures must be established to ensure fairness and relevance to intended competencies.[10]

   For non-standardised assessments, the emphasis lies in real-life application and expert judgement. Bias is inherent, but it can be minimised by using multiple assessors and multiple assessments over time. Feedback should be narrative, offering deeper insights into performance. Validity depends on adequate preparation of both trainers and trainees.[11]
3. "*Distinction between summative and formative is replaced by a continuum of stakes, and decision-making on learner progress is proportionally related to the stakes.*"[4]
   In traditional assessments, the distinction between formative (low-stakes) and summative (high-stakes) is clear. In programmatic assessment, this becomes more fluid. Low-stakes assessments guide learning and improvement, while high-stakes assessments are used for certification or other key decisions. The amount of evidence required is proportional to the stakes involved, similar to monitoring a patient's condition over time—minor issues are addressed early on, whereas major decisions (eg, surgery) are based on cumulative understanding of the patient's health.[4]
4. "*Assessment information is triangulated across data-points.*"[4]
   Information pertaining to the same content is triangulated, similar to synthesising laboratory results, imaging, and patient history in diagnosis. For example, history-taking skills can be assessed using an OSCE, a mini-clinical evaluation exercise, and patient feedback. This method of

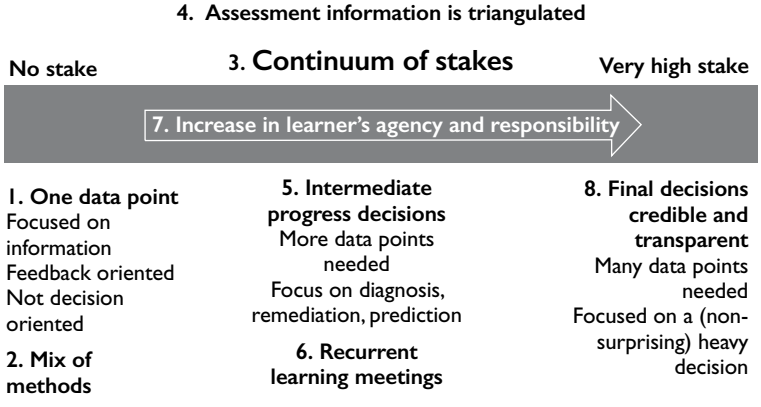

FIG. Principles of programmatic assessment[4]

aggregating results is more meaningful than aggregating by test format.[4]

5. "*Intermediate reviews are made to discuss and decide with the learner on their progress.*"[4]
   Learners meet regularly with mentors or supervisors to reflect on feedback and adjust learning plans, much like adjusting a treatment based on new laboratory results. These intermediate reviews prevent surprising high-stakes decisions at the end of the programme.[4]
6. "*Learners have recurrent learning meetings with faculty using a self-analysis of all assessment data.*"[4]
   Self-assessment is critical for learners to become self-directed professionals. Learners are encouraged to review their portfolio data and discuss with mentors. Initially, guidance from trainers is required for self-assessment to foster deeper learning and professional development.[4]
7. "*Learners are increasingly accountable for their learning.*"[4]
   Over time, learners are expected to take greater responsibility for their learning, similar to patients who assume greater ownership of their health as they become more informed about their condition. This shift in responsibility helps prepare learners for independent practice and fosters lifelong learning.[4]
8. "*High-stakes decisions are made in a credible and transparent manner.*"[4]
   High-stakes decisions, such as those related to certification, are based on multiple assessments collected over time. This approach ensures that decisions are fair and reflect a holistic understanding of the learner's competence. Much like the review of a complex clinical case by a multidisciplinary team, programmatic assessment enables thorough and transparent decision-making.[4]

Implementing programmatic assessment

The implementation of programmatic assessment clearly requires transformative changes to our assessment system. The Royal College of Physicians and Surgeons of Canada has adopted a Competence by Design approach to implement CBME, serving as a 'hybrid' model that blends a competency-based framework within the existing system.[12] Similarly, the transition in our assessment system can be guided by applying the following principles of programmatic assessment while building on the structure of the current framework.

Provide meaningful feedback

A cornerstone of programmatic assessment is detailed feedback. Traditional methods such as grades or pass/fail results offer limited insight, whereas narrative feedback can help learners understand the nuances of their performance. While we have highlighted the value of feedback in WBA, it should also be incorporated into other forms of assessment. For example, detailed feedback after an OSCE could break down performance in communication, clinical reasoning, and technical skills, helping learners target areas for improvement.[13]

Establish a reliable system for collecting information

All assessment data, including feedback, reflective reports, and performance outcomes, must be systematically collected to enable learners and educators to monitor progress over time. e-Portfolios play a crucial role in programmatic assessment, serving as essential tools for tracking these data. An effective e-portfolio should be user-friendly, facilitating seamless access and integration across various platforms.[13,14]

Organise intermediate assessments

Portfolios are only valuable if they are actively used to promote learning. Regular intermediate assessments play a key role by offering diagnostic, therapeutic, and prognostic insights. These assessments ensure that learners receive timely feedback on their current performance, understand areas requiring improvement, and have a clear sense of their future trajectory. By providing of ongoing guidance, they help prevent unexpected outcomes at the end of programmes and enable timely interventions when needed.[13,14]

Adapt high-stakes examinations for competency-based medical education

Although CBME relies heavily on frequent low-stakes assessments, high-stakes examinations continue to hold value. However, these examinations must be adapted to align with the CBME framework. The optimal approach is still evolving. The Royal College of Physicians and Surgeons of Canada has implemented several changes that are worth considering.[15]

Earlier timing

Scheduling examinations earlier in training allows learners to demonstrate competence sooner, freeing up time in later stages to focus on clinical practice.

Integration with other assessments

Examinations should complement WBAs by focusing on competencies that are more difficult to assess in clinical settings, such as the management of rare conditions.

Sequencing

Written examinations should precede practical or oral examinations, ensuring learners have the necessary foundational knowledge before progressing to more complex skills.

Global rating scales

In practical examinations, transitioning from checklists to global ratings encourages the assessment of higher-order clinical decision-making, rather than rote memorisation of facts.

Updated psychometrics

New psychometric approaches focus on decision consistency, ensuring that examinations measure true competence rather than simply comparing learners with their peers.

Promote faculty development

As assessment methods and tools are only as effective as the faculty who utilise them, it is essential that faculty develop the competencies required for accurate assessment and effective feedback. Strong leadership, supported by a committed faculty, has been identified as the most important factor enabling implementation of programmatic assessment.[16,17] The Hong Kong Academy of Medicine has developed a comprehensive faculty development framework for trainers, examiners, supervisors of training, and collegial leads.[18] Additionally, it is crucial to prepare trainees for this new assessment model. Training programmes are either currently in place or will soon be introduced to support and facilitate this transition.

Ensure reliable decision-making

For high-stakes decisions, such as passing or promoting a learner, it is essential to consider a comprehensive range of data gathered from diverse settings, methods, and assessors. These data should include both quantitative measures and qualitative feedback, such as written or verbal evaluations. Professional judgement is required to effectively interpret and synthesise this information. Given the significant consequences of these decisions, it is critical to ensure that the process is fair and trustworthy.[12] To support the integrity of this decision-making process, recommendations have been established for procedural measures and quality assurance frameworks.[8,19]

Evaluate and adapt the programme

Like any curriculum, an assessment programme must undergo regular evaluation to identify potential issues and areas for improvement. Continuous monitoring ensures the programme remains aligned with its goals and is responsive to learner and faculty feedback. This process is essential to maintain the relevance and effectiveness of programmatic assessment.[13]

Conclusion

Programmatic assessment represents a major advancement in medical education by integrating diverse assessment methods, providing continuous feedback, and using multiple data points to make informed decisions. This learner-centred approach helps ensure that future clinicians are equipped to meet the challenges of modern healthcare, much like a comprehensive, multidisciplinary treatment plan supports better outcomes for patients.

As articulated in our Position Paper on Postgraduate Medical Education,[9] we are progressing along the journey towards CBME, within which programmatic assessment is a key component. In this context, there is a clear need to review Hong Kong's assessment systems to ensure alignment with CBME principles. However, such progression does not imply the complete replacement of high-stakes examinations. Even in countries that have advanced further along the CBME journey, high-stakes examinations continue to serve important roles in maintaining standards and ensuring public accountability.[15] The priority, therefore, is not to abolish such examinations but to integrate them within a programmatic framework that values multiple sources of evidence, meaningful feedback, and longitudinal decision-making. The evolution towards programmatic assessment should be viewed as a gradual and deliberate process requiring sustained faculty development, structural support, and system-level coordination.

Author contributions

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Acquisition of data: HY So.
Analysis or interpretation of data: HY So, AKM Chan.
Drafting of the manuscript: HY So.
Critical revision of the manuscript for important intellectual content: All authors.

Conflicts of interest

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