Competency-Based Medical Education: Developing a Framework for Obstetrics and Gynaecology

Nicolette Caccia, MD, MEd, FRCSC,[1,2,3] Amy Nakajima, MD, FRCSC,[4] Fedde Scheele, MD, PhD,[5,6] Nancy Kent, MD, MEd, FRCSC[7]

[1]Department of Obstetrics and Gynaecology, University of Toronto, Toronto ON

[2]Department of Obstetrics and Gynaecology, McMaster University, Hamilton ON

[3]Department of Obstetrics and Gynaecology, Queens University, Kingston ON

[4]Department of Obstetrics and Gynecology, University of Ottawa, Ottawa ON

[5]Departent of Health Systems Innovation, VU University Medical Centre and Athena Institute for Transdisciplinary Research, Amsterdam, the Netherlands

[6]Department of Obstetrics and Gynaecology, St. Lucas Andreas Hospital, Amsterdam, the Netherlands

[7]Department of Obstetrics and Gynaecology, University of British Columbia, Vancouver BC

Abstract

The development of a Canadian competency-based medical education (CBME) curriculum in obstetrics and gynaecology, slated to begin in 2017, must be rooted in, and aligned with, the principles of CanMEDS 2015 and Competence by Design. It must also reflect the unique realities of the practice of the specialty. The Dutch Society of Obstetrics and Gynaecology has been at the forefront of the movement to design and implement competency-based training for obstetrics and gynaecology. The Dutch curriculum represents a practical example of how such a program could be developed. Several CBME curricular initiatives have now also begun across Canada.

Résumé

La mise sur pied d'un curriculum canadien de formation médicale fondée sur les compétences (FMFC) en obstétrique-gynécologie (devant débuter en 2017) doit être ancrée dans les principes des programmes « CanMEDS 2015 » et « La compétence par conception ». Ce curriculum doit également refléter les réalités particulières de la pratique de la spécialité. La *Dutch Society of Obstetrics and Gynaecology* est à l'avant-garde du mouvement visant la conception et la mise en œuvre de la formation fondée sur les compétences en obstétrique-gynécologie. Le curriculum hollandais représente un exemple pratique de la façon dont un tel programme pourrait être élaboré. Plusieurs initiatives de FMFC ont maintenant vu le jour au Canada.

Key Words: Competency-based medical education, obstetrics and gynaecology curriculum, assessment, milestones

Competing Interests: None declared.

Received on June 5, 2015

Accepted on July 27, 2015

INTRODUCTION

Physician competence is a complex construct that is multidimensional, dynamic, contextual, and developmental in character.[1] For each individual competence there is a spectrum of capabilities from novice to master. This progressional competence for learning is situated in the workplace. Frank et al. introduced the term "dyscompetence" to refer to a relative deficiency in one or more domains of competence.[1] This term is less pejorative than "incompetence," and it encompasses both a competency not yet achieved and a competency that has been lost. Currently, obstetrics and gynaecology trainees commonly graduate with skills they do not need or use once they begin practice. Conversely, there are practices for which their training programs did not prepare them. Hence, there is a need to restructure our current training to better align with the authentic professional activities of our specialty.

Why Should We Move to a Competency-based Medical Education Format?

The Royal College of Physicians and Surgeons of Canada is adopting a competency-based medical education approach to training, integrating best practices in medical education, to better meet and respond to patient and societal needs.[2] The CanMEDS Physician Competency Framework,

J Obstet Gynaecol Can 2015;37(12):1104–1112

around which Canadian specialty training and continuing professional development is structured, required a significant update to align with a CBME approach. To this end, the Royal College of Physicians and Surgeons of Canada undertook the CanMEDS 2015 project in 2012. CanMEDS 2015[3] includes more clarity in role descriptions and definitions, with less overlap between the seven roles of Medical Expert, Communicator, Collaborator, Leader (formerly Manager), Health Advocate, Scholar, and Professional. CanMEDS 2015 was unveiled in October 2015 at the International Conference on Residency Education in Vancouver.

Competency milestones within each role have been developed to describe physician abilities across the continuum of medical education: from entry into postgraduate training, throughout residency, transitioning into practice, throughout independent practice, and transitioning out of professional practice. Milestones refer to the abilities expected of a physician or trainee at defined stages of their development. Milestones form a developmental model of training, with descriptions of behaviours that must be observable or demonstrable and that have a goal to make explicit what is implicit.[4] Milestones serve as a learning roadmap for trainees, and they allow teachers to track the progression from a dependent to an independent learner.

CBME requires that trainees demonstrate competence in progressing along the path from novice to expert. This requires clear definitions of "expected" competencies or milestones, along with appropriate assessments, to determine if the competencies are being met and performed consistently within the context of the clinical environment or workplace. This concept of developmental competence has been used successfully in other health professions. Benner developed a similar concept using five stages of competence, also from novice to expert, which has been used extensively in nursing and adapted to other professions.[5]

Competence is considered to be "the ability to do something successfully." Competencies are general attributes that may be components of an ability to execute a specific activity that can be observed and appraised, but competencies cannot be measured and appraised independently. In clinical practice, competencies are intertwined in complex ways that make them less explicit and measurable. They can be built by starting with concrete clinical activities. However, in developing a CBME curriculum, we must disentangle competencies from the activities themselves, as a competency is an intrinsic personal attribute rather than an action, even though a competency is made manifest in the action(s) that we carry out to demonstrate it.

The development of competence requires an environment that nurtures the learner. We know that experience and mistakes contribute to learning, and that effective learning is promoted by a supportive environment which allows learners to make mistakes with minimal or no consequences. A supportive environment promotes knowledge construction, as learners gradually and comfortably expand their skill set. An example of this would be a child learning to ride a bicycle. The child starts by riding a bicycle with training wheels, progressing to riding without training wheels but with a steadying hand on the back of the bicycle. The child then practises riding independently on quiet streets and masters this ability before progressing to riding on busy streets. At each stage, new skills are built on prior skills as confidence and mastery increase. Similarly, medical competence is consolidated with practice and a chance to make mistakes in an environment that will encourage learners to try again.

Learning From Others

CBME in obstetrics and gynaecology was initiated in the Netherlands in 2004,[6] and a great deal may be learned from the Dutch experience. A crucial concept developed by the Dutch is the Entrustable Professional Activity.[7] EPAs are the integrated competencies of everyday practice that allow one to perform the professional activities expected of a "good" doctor within any given specialty.[7] At their core, EPAs are essential professional activities that:

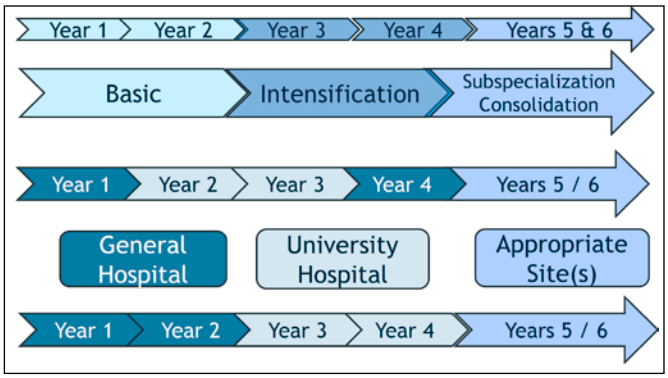
1. specify knowledge, skills, and attitudes;
2. lead to recognized outputs of professional work;
3. can be independently executed;
4. are observable and measurable; and
5. encompass a set of competencies across different roles.[8]

EPAs define a specialty in terms of the specific independent professional activities that are familiar to learners, faculty, and the public, and make core competencies meaningful by placing them in a familiar context without losing a holistic view of the profession.[9] Milestones are behavioural descriptors that need to be linked to a context to allow for training and assessment in daily practice. EPAs provide that necessary context and allow for individual learning trajectories based on longitudinal assessment.[9]

ABBREVIATIONS

CBME	competency-based medical education
EPA	Entrustable Professional Activity
STAR	Statement of Awarded Responsibility

Figure 1. Dutch Obstetrics and Gynaecology Residency Curriculum[13]



EPAs are also identifiable clinical activities that a trainee can be trusted to perform with minimal or no supervision. Communities of practice, such as obstetrician-gynaecologists, are well able to identify such EPAs. Physicians are also easily able to identify trainees, and indeed colleagues, to whom they would entrust care in any given situation.[10] Hence, the concept of being "entrustable" is critically important, as it refers to the privilege of the trainee to engage in an activity without direct supervision. It also implies a responsibility on the part of the "entruster" for the care being provided by the trainee. Ensuring competence in entrustable activities requires both standardization of learning outcomes and individualization of the learning process, to ensure that the trainee receives the necessary training to meet the minimum competency. Ultimately, deliberate "decisions of entrustment" for concrete entrustable activities are based on a professional judgement of competence by experienced clinicians. Structuring resident education and assessment around entrustment serves two purposes: refocusing attention on the central element of progression, and reminding clinician-educators of the importance of subjecting the process of entrustment to critical examination.[11]

Once constructed, EPAs can be assigned to CanMEDS roles and aligned with the learning objectives of any clinical rotation. All CanMEDS competencies can be assessed by EPAs in the workplace but few EPAs can measure all CanMEDS competencies at once. However, when all the EPAs for a given specialty are combined, all the CanMEDS competencies and roles will have been assessed. An example of an EPA that incorporates competencies from all the CanMEDS roles is the ability to perform a Caesarean section. Using the correct operative technique for the correct indication, and being able to deal with any complications, are encompassed in the Medical Expert role. Working with other health care professionals in the labour and delivery unit and the operating room to organize an emergency CS demonstrates Collaborator and Leader competencies. Communicator competencies include the discussions with the patient and her family. A trainee can demonstrate Health Advocate competencies by advocating for vaginal birth after CS and promoting external cephalic version of breech presentations to reduce CS rates. The commitment to ethical CS practice falls into the Professional role, and performance of CS according to evidence-based medicine is a Scholar competency. A smaller EPA would be the insertion of an intrauterine device. Here, the Medical Expert role involves demonstrating an understanding of the mechanism of action, knowing the indications, contraindications, and potential complications, acquiring the ability to insert the IUD, and recognizing and managing complications when they occur. Communicator competencies include documenting the discussion and insertion. The Leader role is demonstrated by ensuring appropriate supplies and preparation for the insertion of the IUD.

Placing specialty specific training in a broader context, van der Lee et al. asked patients, nurses, midwives, family physicians, and members of hospital boards to describe three aspects of performance identified as being important to the specialty of gynaecology, which were then mapped to CanMEDS roles.[12] Reflective practice, collaboration, and contextual awareness were all felt to be important aspects of gynaecologic practice by the non-physicians. However, these receive minimal attention in the CanMEDS framework. Viewed from a perspective of team-based, patient-centred health care in the real world, CBME curricula must consider the context in which our trainees will ultimately practise, and must attempt to accommodate both learner and societal interests in determining the ideal competencies of our specialty. This will require a greater alignment of training in obstetrics and gynaecology with interprofessional practice and societal needs.[12]

Residency training in the Netherlands takes six years (see Figure 1).[13] In the Dutch model, the development of competence is mirrored by an adapted level of supervision, so that a lessening of supervision comes with increasing entrustment. At Level 1, learners only observe modelled behaviour, because they do not have the skills or knowledge to perform a specific EPA, even with full supervision. By Level 2, they can practise the EPA under controlled circumstances with full supervision. At Level 3, they practise the EPA with supervision on demand. At Level 4, unsupervised practice is allowed, with the caveat that learners will seek help when their capabilities are insufficient to competently complete the task. Finally,

Competency levels expected at different stages of training in the Dutch system[13]

Benchmarks for attaining levels of competency (levels 1 to 5) throughout training	Benchmark 1 Year 2	Benchmark 2 Year 4
Uncomplicated antenatal care	5	
Complicated antenatal care	3	5
Intrapartum care	5	
Complicated childbirth	3	5
Basic high-risk childbirth	3	3
Uncomplicated postpartum and newborn care	5	
Complicated postpartum and newborn care	3	5
Basic reproductive medicine	2	4
Benign outpatient gynaecology	3	4
Basic surgery	3	4
Basic urogynaecology and pelvic floor	2	4
Sexual health	3	4
Basic oncology	2	4
Perioperative care	3	4

at Level 5, they supervise other learners in that specific EPA.[13] Direct observation and formative feedback are independent of the need for supervision, and promote learning at all levels.

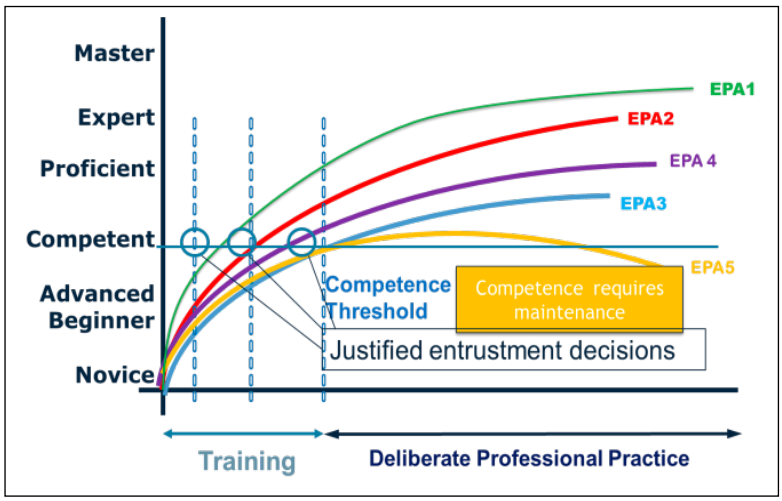
The Dutch competency levels can be mapped to our Canadian model of Competence by Design.[2] Dutch Level 1 ("has knowledge of") is supported by modelling, Level 2 ("performs with full supervision") by scaffolding, Level 3 ("performs with limited supervision") by fading, and levels 4 and 5 ("performs without supervision," and "able to supervise others and teach them") through entrusting. Fourteen of the basic Dutch obstetrics and gynaecology EPAs are shown in the Table.[13] By the end of the second year of training, the learner is expected to reach Level 5 in the cornerstones of practice, such as uncomplicated antenatal care, uncomplicated intrapartum care, and uncomplicated postpartum and newborn care. At this point, more complicated EPAs are entrusted only at the "limited supervision Level" (Level 3). It is not until the end of their fourth year that trainees are expected to be entrustable at the "performs without supervision Level" (Level 4). Even then, high-risk childbirth is still entrusted only at the limited supervision level, as consultation with a subspecialist is usually still required.

Ten Cate[14] developed EPAs for obstetrics and gynaecology in the Netherlands in 2004 with a team led by Scheele. They complemented EPAs with Statements of Awarded Responsibility.[13] A STAR is documentation of entrustment for a given EPA. It represents a formal entrustment decision made when the competence threshold is reached and is confirmed by three staff members. A STAR is documented in the resident portfolio and institutional registers, allowing for inter-institutional portability of entrusted practice. One can infer general competence after sufficient EPAs have been rewarded with STARs. In a competency-based curriculum utilizing EPAs and STARs, the concept of flexible training length becomes possible. However, in practice, funding constraints and service requirements make this challenging.

Each of the major EPAs has component parts or "nested EPAs" within it. Nested EPAs can be awarded a STAR for either performance with minimal supervision or without any supervision. For example, complicated childbirth has a number of nested EPAs with overlapping skills. Management of a postpartum hemorrhage, uterine inversion, shoulder dystocia, third and fourth degree tears, assisted vaginal delivery, and CS are all included in the overarching competency of the diagnosis of obstetrical complications. Such nested EPAs can be used to assess several of the major competencies of the specialty.

A well-constructed EPA can be used for a variety of learners who perform the same activity at different phases of their training, but with differing levels of skill and with differing levels of entrustment. For example, the EPA of "managing a normal pregnancy without supervision" would be attained at the end of family medicine training, but earlier in the training of an obstetrician. Similarly, "management of a complicated pregnancy with limited supervision" would be attained near the end of the training of a generalist obstetrician, and perhaps at the midpoint in the training of a maternal–fetal medicine subspecialist.

Figure 2. The competency curve for a single trainee (adapted from ten Cate et al.[20])



Decisions of entrustment have a substantial element of subjectivity. As ten Cate points out,[14] faculty base their entrustment decisions on a global assessment of whether the trainee performs well and seeks help when necessary or does not accept the task if he/she does not feel confident. Entrustment implies a personal involvement and accountability by the faculty for the competence of the trainee at the time of entrustment. However, the degree of supervision affects the ability of trainees to learn.[15] Early unsupervised care may have a negative effect on patient safety, add to the cost of care, increase the liability for the supervisor, and have a negative effect on the learner, especially if their decisions have led to patient harm. Conversely, insufficient self-guided and independent decision–making may negatively affect the trainee's learning trajectory by not providing an appropriate level of challenge. Appropriate supervision for learners at all levels can enrich learning while still ensuring the delivery of safe and effective patient care.[16] Training programs need to cultivate a safe, well-supervised educational environment which includes multiple opportunities for assessment, because frequent formative assessment and timely feedback are essential to both CBME and patient safety.

The competency curve for one trainee is shown in Figure 2. The x-axis represents years of practice, divided into training and deliberate professional practice. The y-axis measures competence from novice to master. For EPA1, the management of a normal delivery, the competence threshold is achieved early and competence continues to increase through training to the expert level. With EPA2, the management of a complicated delivery, competence is attained more slowly and continues to increase, with the expert level only being attained once in independent practice. The trainee reaches the competent level for EPA3, perioperative care, by graduation, and continues to improve performance to the Proficient level through independent practice. Competence is achieved at different rates for different EPAs, continuing to increase in the majority. Graduation is defined as achieving competence in all relevant EPAs for the specialty. However, competence declines in the case of any EPA not used in practice, and dyscompetence can develop, as shown with EPA5.

The Dutch experience in implementing CBME can offer us useful lessons. Basic milestones are outlined in the Dutch National Competency-Based Curriculum for Obstetrics and Gynaecology document for the competencies required of a generalist, with additional milestones for those in a subspecialist program.[13] There is a clear division between the core competencies expected of every obstetrician-gynaecologist in training and electives aimed at subspecialty differentiation, which build on those core competencies. Entrustment is based on a portfolio populated predominantly by low-stakes formative assessments, accompanied by reflection on the part of the learner, leading to guided improvement. Summative assessment, including an annual national examination, is included. However, it is the formative assessments that are pivotal to progression within the training programs.

The overall curriculum is set at a national level with a strategic and tactical framework for implementation. The training sites use this to create an operational curriculum plan that respects the resources and needs of each site. This allows for flexibility and increases site buy-in. Adherence to the curriculum is aided by annual onsite internal quality assurance programs, based on a continuous quality improvement model focused on the resident experience of

the learning climate (D-RECT questionnaire), assessment of the learning opportunities, assessment of clinical teacher performance (SET-Q questionnaire), and other relevant feedback such as exit interviews. These data are integrated, analyzed, and reported annually to the local program director and within the hospital to generate a transparent improvement plan and cycle as required by the national governing bodies. An accreditation board monitors these processes every five years to ensure robust quality assurance. When internal quality assurance systems are absent or rudimentary, external assessors for accreditation will provide strict supervision and remediation. Once there is evidence that the internal systems are performing well, the external supervision is transitioned to mere observation and facilitation of the continuous quality improvement process.

It is not surprising that the Dutch have found that both trainees and clinicians find it easier to assess procedural skills and the Medical Expert competencies as a rule. In creating a Canadian curriculum, structures and processes need to be established and implemented, complemented by focused faculty development and active learner training for residents, to ensure that there is teaching and assessment of the intrinsic roles as well.

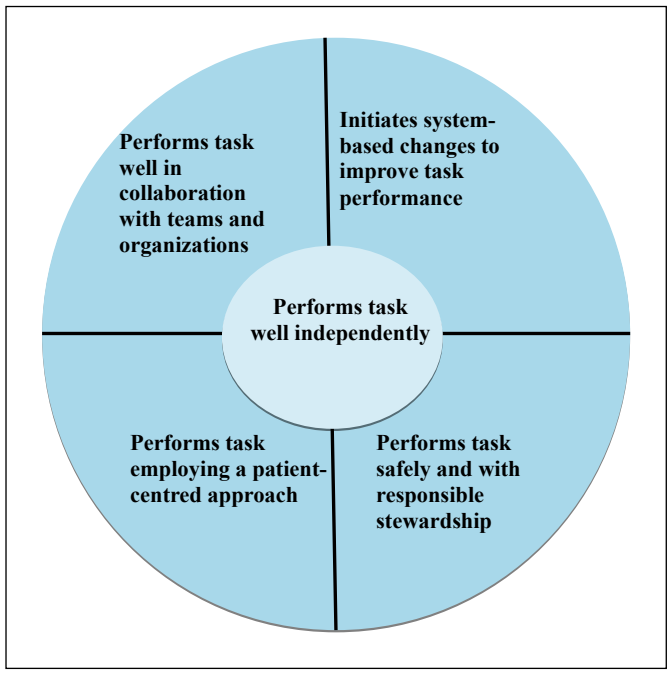
Assessment in CBME

The concept of EPAs is well supported in the assessment literature. In Miller's framework for assessing clinical competence,[17] the learner first "knows" something, then "knows how" to use that information, then "shows how" to use it, and finally progresses to the "does" level, at which point the learner performs the acquired skills in actual clinical practice. "Does" is the apex of demonstrating competence. It is at the "does" level that EPAs can be utilized to assess a trainee's performance. Hence, CBME curricula require that "does" be unpacked and elaborated (Figure 3). The task must be performed:

1. using a patient-centred approach with shared decision making;
2. safely and with responsible stewardship;
3. in collaboration with teams and organizations; and
4. with an awareness that there may be system-based changes to improve the task.

These four criteria place "does" in the wider context of the CanMEDS roles and broadens the assessment framework to add meaning from the workplace. Any assessment method at the "does" level is characterized in some way by reliance on the subjective judgement of knowledgeable people.[18] However, our current assessment tools were developed mainly to assess "knows," "knows how," and "shows." They can certainly be adapted to assess "does," but this requires multiple assessments over time, assessing different content in different contexts and using a variety of assessment tools.[18]

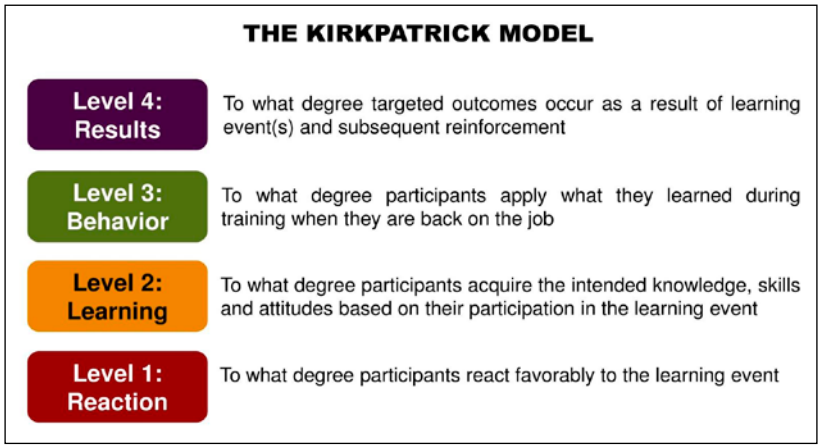
Figure 3. Expansion of Miller's "does" categorizations for CBME[17]



In the Kirkpatrick Evaluation Schema (Figure 4),[19] each successive assessment level is built on information provided by the levels below. The bottom level represents reaction, which is assessed according to learner satisfaction and utility judgement. The second level up represents learning, which is divided into immediate knowledge, knowledge retention, and demonstration of skill. The third level represents performance, manifest in observable and measurable behaviours. The fourth and most difficult level to assess represents results, measured by patient outcomes and societal benefits. Current trainee assessment concentrates on the learning level (Level 2), while EPAs measure at the level of performance (Level 3).

Assessment in CBME is thus tied to a trainee's performance of the essential clinical activities that define the specialty. Competencies and EPAs are two dimensions of a grid in which an EPA can be mapped to a number of competencies.[20] Competence becomes an integrated quality combining knowledge, skills, and attitudes, and the ability to use them in the work place to produce the desired results for patients. Competencies are most relevant when they are defined in the context of the clinical environment,

Figure 4. Kirkpatrick Evaluation Schema



and hence competence varies according to the environment. Entrustment is predicated on confidence by the assessors that the desired outcome will result. We know that entrustment decisions take place every day in health care settings at the competence level corresponding to the "performance–observable and measurable behaviour" level of the Kirkpatrick Evaluation Schema[19] or the "does" level in Miller's pyramid.[17]

In summary, assessment must be formative and frequent to aid in making entrustment decisions.

The Challenges of Competency-Based Medical Education

The introduction of CBME is not without its challenges. The successful use of EPAs depends on a clear overview of the resident's progress and a flexible clinical teaching environment that can be used to fulfil the remaining needs of the trainee, both in terms of case mix and volume.[9] Workplace assessment of competence requires a reorganization of the clinical environment to allow fulfilment of these conditions. The clinical environment must be aligned with the intended curriculum of the CBME program. The introduction of a curriculum focused on training in a clinical environment with priorities other than those that have to do with the training of learners will result in an enacted curriculum that differs from the intended curriculum created by professional bodies and educational organizations.[21] Much of the literature on CBME focuses on the refinement of the educational process, such as feedback, assessment, and faculty development, underestimating the issue of the alignment of the workplace culture and the intended learner goals.[22] Using EPAs for postgraduate medical training will require an adaptive workplace and trained faculty whose values and culture are aligned with the intended curriculum.[9]

One of the greatest barriers to this alignment is the current lack of a culture of assessment. The key to successful CBME is appropriate assessment of skills in the clinical setting.[23] Assessment is a process that should be performed "with" trainees, and not "on" them. An assessment system must include a clear purpose and a clear definition of what is to be assessed, appropriately trained assessors, timeliness and transparency, and reliable processes to disseminate and collect the assessments. Education and assessment must be recognized as important. This is a significant paradigm shift from our current model of training and assessment. Faculty development and recognition or rewards are necessary to generate and support this culture of assessment. Clinician-educator portfolios can provide a framework for recognition. Incentives to assess trainees can be built into the system, such as linking assessment to the teaching portfolio. There should be bi-directional assessment, allowing trainees to assess the teaching ability of faculty members (once their own assessment has been posted) to complete the loop. Service and assessment must be reciprocally linked, so that trainee service is "paid for" by faculty assessment, and vice versa. Robust assessment and subsequent entrustment allow trainees to be best deployed to provide service in areas in which they are competent. Thus, a trainee "gives back" time, in the form of service, after competency is attained. Clinical and teaching responsibilities must also be better balanced for successful implementation of CBME. Adequate time to perform assessment must be incorporated into the system. This will necessitate a change in the delivery of care, with educational time being built into clinical encounters. Once competence has been attained and trainees can perform a given professional activity without supervision, they can perform these tasks independently and can free up time for the faculty to concentrate on developing other competencies still to be attained by that trainee or those of other trainees.

Inherent in CBME is a need for individual customization of residency programs to better accommodate the needs of both excelling and poorly performing residents. This requires forward planning and innovations, such as structuring rotations into modular components of shorter duration. It has been the Dutch experience that overall time commitments balance out. If an average resident requires six months of training to achieve competence in a rotation, the excelling resident might demonstrate competence after only four months, consisting of two blocks of two months each, while the poorly performing resident might need eight months or four blocks. The training requirements of the poorly performing resident would thus be offset by the fast-track resident, in terms of the overall training resources of the residency program.

To encourage faculty buy-in, assessment tools must be clear and easily understood and faculty must be involved in their development. Easy-to-use tools mandate an electronic form of assessment, which may include internet- or computer-based forms or an app. This transition will require an initial financial outlay and utilization of information technology expertise. Coordination of effort and sharing of tools or skills between institutions or specialties will help manage the costs.

A shift to CBME will also require changes in resident attitudes to assessment. Residents will need to become active participants in soliciting and responding to feedback and will need to take ownership of addressing their learning needs. A conscious effort is required to incorporate formative feedback and deliberate practice of tasks mindfully to achieve mastery in the field.

Faculty development will be a major issue but it is the key to successful implementation of CBME. There are significant challenges to preparing frontline clinician-teachers. The majority of faculty lack any formal training in assessment and teaching. In addition, they need to develop an explicit awareness and appreciation of the core clinical competencies; this is required both to understand the principles of CBME and to be able to train and assess learners in a CBME system.[24] Faculty must learn how to deliver valid and reliable assessments of trainees to minimize rating errors and improve their discrimination and accuracy. There must be faculty agreement on the essential elements of the competency to be observed, and on standardized criteria for grading the individual competencies. Since competencies are contextual, there must be integrated assessment focusing on direct observation, and it must occur as regularly and as authentically as possible. There must be strategies in place to increase the frequency of direct observation of the trainees.

A notable challenge is that current faculty were not taught in a way that was aligned with the CanMEDS Physician Competencies Framework during their own training, and now they must learn how to anchor their teaching to the CanMEDS roles. They must be especially supported to develop strategies for teaching and assessing competence in the intrinsic roles (such as Collaborator, Health Advocate, and Leader) in order to train learners who are well-rounded and competent to provide safer, quality patient care.

There will be a need for ongoing faculty development process over years, both at the systems level and at the level of the individual teachers.[24] High-level institutional administration support of the leadership provided by the program director and key faculty champions at the local level will be critical to successful CBME implementation.[16] It is essential that the process of transition to a CBME model has the flexibility to meet the needs of the learner while promoting the necessary change in the existing infrastructure of a time-and-process-based system. This has the potential to be impeded by a lack of strategies to fund a full competency-based, flexible-time model.

Canadian CBME Initiatives

The University of Montreal Department of Obstetrics and Gynaecology has constructed a CBME-based assessment framework.[25] Based on this model, the University of Manitoba Department of Obstetrics and Gynaecology has constructed rubrics for the assessment of gynaecological surgery (M. Burnett, personal communication, May 30, 2015). The Department of Obstetrics and Gynaecology at Queens University has constructed assessment tools for core obstetrical competencies (S. Chamberlain, personal communication, June 11, 2015). At the University of Toronto, CBME assessment pilot studies in maternal–fetal medicine, reproductive endocrinology/pediatric and adolescent gynaecology, and urogynaecology have been initiated, and a CBME-based framework for ultrasound skills is under development (D. Steele, personal communication, September 25, 2015).

CONCLUSION

Competency-based medical education offers an opportunity to rethink and remodel residency training, but poses significant challenges to implementation. CBME will require changes in our approach to residency education, including a substantial increase in direct observation with frequent formative assessment of observable and measurable outcomes. It will require longitudinal teaching and continuous assessment of the progression of competence of individual trainees. Faculty development

will play a crucial role, requiring an understanding of the basic principles of teaching, learning and assessment, as well as the theories underpinning CBME and EPAs. Focused education on direct observation, formative assessment and debriefing will be particularly important. The Dutch experience and the CBME initiatives which have been undertaken in various Canadian departments of obstetrics and gynaecology will help formulate a framework on which to construct a robust Canadian CBME postgraduate curriculum. The Association of Academic Professionals in Obstetrics and Gynaecology (APOG) has taken a lead in supporting a national approach towards achieving that end.

ACKNOWLEDGEMENTS

We would like to thank Margaret Burnett, Maggie Morris, and Lucie Morin for their ongoing support and advice. This manuscript would not have been possible without the support of the other members of the APOG Education Innovation Committee: Sharon Dore and Peggy Sagle.

REFERENCES

1. Frank JR, Snell LS, ten Cate O, Holmboe ES, Carraccio C, Swing SR, et al. Competency-based medical education: theory to practice. Med Teach 2010;32:638–45
2. Snell L, Frank J, Stoneham G, De Rossi S, Fletcher W, Gillis K, et al. Chapter 7: competency-based medical education (CBME). In: Frank JR, Harris KA, eds. Competence by design: reshaping Canadian medical education. Ottawa (ON): Royal College of Physicians and Surgeons; 2014:99–105.
3. Frank J, Snell L, Sherbino J, eds. The draft CanMEDS 2015 physician competency framework—series IV. Ottawa (ON): Royal College of Physicians and Surgeons of Canada; 2015. Available at: http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/framework/canmeds2015_framework_series_IV_e.pdf. Accessed May 1, 2015.
4. Hicks PJ, Schumacher DJ, Benson BJ, Burke AE, Englander R, Guralnick S, et al. The pediatrics milestones: conceptual framework, guiding principles, and approach to development. J Grad Med Educ 2010;2:410–8.
5. Benner P. Using the Dreyfus model of skill acquisition to describe and interpret skill acquisition and clinical judgment in nursing practice and education. Bull Sci Technol Soc 2004;24:188–9.
6. Scheele FA, Teunissen PW, van Luijk S, Heineman E, Fluit L, Mulder H, et al. Introducing competency-based postgraduate medical education in the Netherlands. Med Teach 2008;30:248–53.
7. ten Cate O, Scheele F. Competency-based postgraduate training: can we bridge the gap between theory and clinical practice? Acad Med 2007;82:542–7.
8. Boyce P, Davies M, McEvoy P, Spratt C. Using entrustable professional activities to guide curriculum development in psychiatry training. BMC Med Educ 2011;11:96.
9. van Loon K, Driessen EW, Teunissen PW, Scheele F. Experiences with EPAs, potential benefits and pitfalls. Med Teach 2014;36698–702.
10. Giudice E, Carraccio C. Best evidence calling for educational reform: will we do the right thing? J Grad Med Educ 2011;3:577–9. doi: http://dx.doi.org/10.4300/JGME-D-11–00127.1.
11. Jones MD, Rosenberg AA, Gilhooly JT, Carraccio CL. Competencies, outcomes, and controversy—linking professional activities to competencies to improve residents education and practice. Acad Med 2011;86:161–5.
12. van der Lee N, Fokkema JP, Westerman M, Driessen E, van der Vleuten CPM, Scherpbier A, et al. The CanMEDS framework: relevant but not quite the whole story. Med Teach 2013;35:949–55.
13. Scheele F, Caccia N, van Luijk S, van Loon K, den Rooyen C. BOEG: better education for obstetrics and gynaecology. Dutch national competency based curriculum for obstetrics and gynaecology (NL). English translation, 2013. Available at: http://knmg.artsennet.nl/web/file?uuid=acd04178–734f-44af-935c-2300fba1569f&owner=a8a9ce0e-f42b-47a5–960e-be08025b7b04&contentid=149209&elementid=1785861. Accessed May 3, 2015.
14. ten Cate O. Trust, competence, and the supervisor's role in postgraduate training. BMJ 2006;333:748.
15. Sterkenburg A, Barach P, Kalkman C, Guilen M, ten Cate O. When do supervising physicians decide to entrust residents with unsupervised tasks? Acad Med 2010;85:1408–17.
16. Iobst W, Sherbino J, ten Cate O, Richardson DL, Dath D, Swing SR, et al. Competency-based medical education in postgraduate medical education. Med Teach 2010;32:651–6.
17. Miller GE. The assessment of clinical skills/performance. Acad Med 1990;(Suppl)65:S63-S67.
18. van der Vleuten CPM, Schuwirth LWT, Scheele F, Driessen EW, Hodges B. The assessment of professional competence: building blocks for theory development. Best Pract Res Clin Obstet Gynaecol 2010;24:703–19.
19. Kirkpatrick DL, Kirkpatrick JD. Evaluating training programs: the four levels. San Francisco (CA): Berrett-Koehler; 2005.
20. ten Cate O, Snell LS, Carraccio C. Medical competence: the interplay between individual ability and the health care environment. Med Teach 2010;32:669–75.
21. Billett S. Constituting the workplace curriculum. J Curriculum Stud 2006;38:31–48.
22. Bok HG, Teunissen PW. Patients and learners: time for a re-evaluation of our goals in bringing them together. Med Educ 2013;47:1157–9.
23. Carraccio C, Sectish TC. Report of colloquium II: the theory and practice of graduate medical education—how do we know when we have made a good doctor? Pediatrics 2009;123:S17.
24. Dath D, Iobst W. The importance of faculty development in the transition of competency-based medical education. Med Teach 2010;32: 683–6.
25. Université de Montréal Programme de Résidence en Obstétrique-Gynécologie. Montreal (QC): Université de Montréal; 2015. Available at: http://www.deptobsgyn.umontreal.ca/wp-content/uploads/objectifs_exigences_residence.pdf. Accessed May2, 2015.