Everything You Wanted to Know about Competence by Design but were afraid to ask

A Guide to CBME / CBD
Version 1.0

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Preamble:

In October 2016, the Competency Based Medical Education office was struck to support the postgraduate medical education residency programs in their transition to competency based medical education. Family Medicine’s move to their Triple C curriculum was well underway and the Royal College’s initiative ‘Competence by Design’ had been gearing up since approximately 2014. The RCPSC transition is a massive movement as there are approximately 70 specialties and subspecialties under the auspices of the Royal College. This year, July 2017, two specialties – Anesthesiology and Otolaryngology – will go live with Competence by Design for their incoming PGY1 cohort.

This document has been put together to hopefully assist faculty, learners, administrative staff, etc., to help them understand some of the key concepts of Competence by Design. Many of these concepts are in evolution and therefore, the definitions too will evolve as Competence by Design rolls out.

Definitions:

**CBME: Competency-Based Medical Education**:
Competency-based medical education (CBME) is an outcomes-based approach to the design, implementation, assessment, and evaluation of a medical education program using an organizing framework of competencies (e.g. CanMEDS 2015; [http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework](http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework)). In a CBME system, a curriculum is organized around the outcomes expected of a resident and that resident’s advancement is dependent on having achieved those expected outcomes.

**Competence by Design**:
Competence by Design (CBD) is the Royal College’s version of CBME. It is a transformational change initiative designed to enhance CBME in residency training and specialty practice in Canada.

**Triple C**:
Triple C is a competency-based curriculum for family medicine education that is: Comprehensive, focused on Continuity of education and patient care and Centred in family medicine. It moves away from traditional rotation based models of residency training. It requires residents to be active learners shifting the role of a resident supervisor towards that of a resident’s coach.

**Competence Continuum**
The Royal College’s Competence Continuum breaks down specialist medical education into a series of integrated stages, from the beginning of residency through practice.

**Transition to Discipline (Stage 1)**
This stage emphasizes the orientation and assessment of new trainees arriving from different medical schools and programs.

**Foundations of Discipline (Stage 2)**
This stage covers broad-based competencies that every trainee must acquire before moving on to more advanced, discipline-specific competencies.

This stage covers the essential competencies that make up the majority of a discipline.

**Transition to Practice (Stage 4)**
In this stage, the senior trainee demonstrates readiness for autonomous practice.
**Competence**
Competence is the array of abilities across multiple domains or aspects of physician performance. Competence is both conditional on, and constrained by, each physician's practice context, is dynamic and continually changes over time. Competence is the ability to do all of the tasks of practice effectively and consistently, adapting to contextual and situational needs.

**Competent**
Competent means possessing the required abilities in all domains (areas) in a certain context at a defined stage of medical education or practice. A resident’s promotion from one stage to the next in the competence continuum will occur when they are deemed competent in the competencies defined for that stage.

**Competency**
A competency is an observable ability of a health care professional that develops through stages of expertise from novice to master clinician. Competencies are the things an individual needs to learn to do.

**Milestones**
A milestone is the expected ability of a health care professional at a stage of expertise. CanMEDS milestones illustrate the expected progression of competence from novice to mastery associated with each enabling CanMEDS competency. Each milestone is an observable marker of a person’s ability along a developmental continuum. In the context of CBD, milestones are used for planning, teaching and assessment.

**Entrustable Professional Activity (EPA)**
A key task of a discipline (profession, specialty, or sub-specialty) that an individual can be trusted to perform without direct supervision in a given health care context, once sufficient competence has been demonstrated. In CBD EPAs are the framework for assessment. A Royal College (RC) EPA is linked to a specific stage of the competence continuum and integrates multiple CanMEDS milestones from various CanMEDS Roles relevant to that stage. As resident’s progress through the stages, the RC EPAs become progressively more complex reflecting the resident’s achievement of more complex milestones.

**Work Based Assessment (WBA)**
The assessment of trainees and physicians across the continuum of day-to-day competencies and practice in authentic, clinical environments. It enables the evaluation of performance in context.

**Training experience**
Training experiences are the mandatory and recommended training activities that support a resident’s acquisition of competence. These activities can include, for example: clinical care such as inpatient care, ambulatory clinics, performing technical procedures; or extra clinical activities, for example simulation exercises, scholarly projects, journal clubs etc.

**Competence Committee**
A Competence Committee (CC) is responsible for assessing the progress of trainees in achieving the specialty-specific requirements of a program. These requirements are established for each stage of training, based on design of Competence by Design (CBD).
Goals of CBME:

1. An optimal medical foundation system that is focused on achievement of competence rather than focused on time spent in training.

2. Supervision and entrustment decisions to be based on comprehensive information regarding the learner’s overall strengths and weaknesses.

3. Residents to be provided with consistent assessments and increased feedback to guide progression and development.

4. Residents to be promoted to the next stage of training when they are ready, and at a logical juncture in their training, mirroring promotions in their career to follow.

5. Minimize, where possible, variation in physician performance in practice.

6. Build a medical system that results in high performing graduates, regardless of training location.

7. Seamless transitions between stages of training and a new, true view on an integrated continuum of training and practice.

8. A coordinated and responsive medical education and health care system that promotes positive health outcomes and fosters innovations in patient care.
Core Competencies of CBME:

1. FRAMEWORK: Competencies are clearly articulated

2. PROGRESSION: Competencies are sequenced progressively

3. TAILORED EXPERIENCES: Learning experiences facilitate progression

4. COMPETENCY FOCUSED INSTRUCTIONS: Teaching practices promote progression

5. PROGRAMMATIC ASSESSMENT: Assessment practices support and document progression
<table>
<thead>
<tr>
<th>Core Component of CBME</th>
<th>Features of CBD</th>
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</table>
| **1. FRAMEWORK: Competencies are clearly articulated** | - **Social accountability**: Competencies and outcomes are aligned with societal needs  
- Every discipline will have **Entrustable Professional Activities (EPAs)** and associated milestones that will provide discrete markers of competence.  
- **CanMEDS 2015** and discipline-specific competencies |
| **2. PROGRESSION: Competencies are sequenced progressively** | - **CBD Competence Continuum**: Specific, distinct, integrated stages of training are employed to mark increasing progression on a continuum of competence (stages of increasing competence and independence in practice)  
- **Achievement of competencies are sequenced progressively**: Categorization of milestones and EPAs within each stage of progression |
| **3. TAILORED EXPERIENCES: Learning experiences facilitate progression** | - **Authentic, work-based environments** for learning that match the settings of future practice.  
- Learning experiences are organized to acquire competencies and demonstrate EPAs.  
- A **hybrid model** of competency-based, timed rotations between time-free and a time-dependent approaches.  
- A **de-emphasis on time** to ensure that learning experiences are organized to immerse the learner in authentic practice conditions. |
<table>
<thead>
<tr>
<th>4. COMPETENCY FOCUSED INSTRUCTIONS: Teaching practices promote progression</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Learning guided by <strong>real-time, high quality feedback</strong> from multiple observations.</td>
</tr>
<tr>
<td>▪ <strong>EPAs</strong> to structure learning and focus instruction (in contrast to extemporaneous approaches).</td>
</tr>
<tr>
<td>▪ Teachers act as coaches for the purpose of improvement, with repeated focused observation and feedback.</td>
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<table>
<thead>
<tr>
<th>5. PROGRAMMATIC ASSESSMENT: Assessment practices support and document progression</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ <strong>Assessment for Learning</strong>: Competency-based assessment focused on <strong>EPA observations in the workplace</strong>.</td>
</tr>
<tr>
<td>▪ <strong>Assessment for Progression</strong>: Promotion decisions and certification is accomplished upon successful completion of EPAs and progression through stages of training, and is to be determined by a <strong>Competence Committee</strong> responsible for regular review of learner progress using highly integrative data from multiple EPA and milestone observations and feedback in clinical practice.</td>
</tr>
<tr>
<td>▪ <strong>Changes to the certification examination</strong>: Entry to the Royal College examinations will be aligned with promotion decisions entrusted to the Competence Committees. Examinations will be maintained, but the timing and emphasis of such examinations will shift to occur earlier in training to promote a smoother transition to practice.</td>
</tr>
<tr>
<td>▪ An <strong>electronic portfolio</strong> to demonstrate and record developments in competence and independence</td>
</tr>
</tbody>
</table>
Competence Continuum – Stages of Training and Beyond:
Milestones and Entrustable Professional Activities (EPA):

- **Milestones**
  
  A defined, observable marker of an individual’s ability along a developmental continuum.

- **Entrustable Professional Activity (EPA)**
  
  An essential task of a "discipline" that an individual can be trusted to perform independently in a given context.

  A Royal College EPA is an encompassing task in a clinical setting that may be delegated to a resident by a supervisor once sufficient competence has been demonstrated. The assessment of Royal College EPAs integrates multiple milestones.

  The key difference between EPAs and milestones is that EPAs are the tasks or activities that must be accomplished, whereas milestones are the abilities of the individual.

**Example:**

Parallel parking would be an individual milestone of an EPA related to driving to the store and similarly, the ability to assess and protect the airway can act as a milestone of running a code as an EPA related to medical practice.

**Milestones within an EPA**

EPAs will integrate multiple milestones, usually from different CanMEDS roles. If the EPA is successfully performed, then all the skills that make up the various milestones within that EPA have been learned and the trainee has demonstrated his/her overall competence.
Stage Specific EPAs

Stage Specific EPAs facilitate the progression along the competence continuum. As stage specific EPAs are completed, the trainee progresses through the four stages of the competence continuum.

Milestones and EPAs within the four stages associated with residency.

Transition to practice

Core of discipline

Foundations of discipline

Transition to discipline
New Roles in the Competence by Design Model:

Observer / Coach (Clinical Supervisor)

Faculty will no longer be decision-makers i.e., decide if a resident is Satisfactory / Meets ‘Expectations’ / Unsatisfactory. They will be looking to assess a specific EPA, in terms, of, “I had to do” versus “I didn’t need to be there”. This makes the assessment more straight-forward and meaningful for the Observer and the Learner. However, faculty will be asked to complete more of these ‘mini-biopsies’. The expectation will be that faculty will provide coaching / formative assessment to the learner.

Chair, Competence Committee (CC)

The Competence Committee are the decision-makers: they will be a critical component of competency-based assessment. The CC will be reviewing the ‘mini-biopsies’, along with other assessment tools such as simulation, national examinations, 360 evaluations, etc. The RCPSC has recommended that Chair of the Competence Committee, not be the Program Director, but recognizes in smaller programs that the Program Director may fulfil this role; however, it is recommended that the Program Director be a member of the committee.

The Competence Committee will discuss the progress of each Resident. The CC will meet at least twice a year, though larger programs may require more frequent meetings. The size of the committee should reflect the number of residents in the program, with a minimum number of 3 for smaller programs. (Note: the Program Director may use some discretion – the number of meetings may vary depending on, for example, if residents are having difficulty achieving a particular milestone / EPA. Also, as this is a new committee, it may take additional meetings in order for the committee to gel.)

Members of Competence Committee

Members of the committee are normally from either the Residency Training Program or clinical supervisors associated with the program. Included may be faculty or program director that is external e.g., faculty or program director from another residency program at the University or from the same discipline at another university. May be another healthcare professional or a public member.

Faculty Advisor / Academic Coach

The RCPSC has recommended that Residents have a faculty advisor to mentor them in their development. For programs that use this approach the Faculty Advisor could attend the Competence Committee meeting to summarize the Resident’s progress.

Program Lead for CBD

As the implementation of CBD is work intensive, some programs – particularly the larger ones – have chosen to create a CBD Lead role within their program. This individual would work, in conjunction, with the Program Director with respect to the program implementation of CBD.

Additional Administrative Support

The compilation of the many data points for the EPA's for each resident may require additional administrative assistance.
## Comparison Traditional Model versus CBD Model:

<table>
<thead>
<tr>
<th>Philosophy</th>
<th>Traditional Assessment OF Learning</th>
<th>CBD Assessment FOR Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment type</td>
<td>Largely based on the In-Training Evaluation Report (ITER)</td>
<td>Largely will be based on work based assessments</td>
</tr>
<tr>
<td>Timing of the Assessment</td>
<td>Mid-Unit and End of Rotation</td>
<td>In the moment is optimal</td>
</tr>
<tr>
<td>Assessment scale</td>
<td>• Satisfactory</td>
<td>• Didn’t need to be there</td>
</tr>
<tr>
<td></td>
<td>• Provisional Satisfactory</td>
<td>• Needed to be there just in case</td>
</tr>
<tr>
<td></td>
<td>• Unsatisfactory</td>
<td>• Needed to Prompt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Had to talk them through</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I had to do</td>
</tr>
<tr>
<td>Promotion</td>
<td>Time based e.g., completed 2 blocks of Internal Medicine, 2 blocks of ICU etc. PGY1, PGY2, PGY3 etc.</td>
<td>Outcome based e.g., completion of the EPA’s for each stage.</td>
</tr>
<tr>
<td>RCPSC examination</td>
<td>At the end of training. Successful completion of the certification examination and they are consultant in their discipline.</td>
<td>At the end of Core. Will not be certified until they complete the EPA’s for Transition to Specialty.</td>
</tr>
<tr>
<td>Role of Supervisor</td>
<td>To assess and teach the learner.</td>
<td>To teach / coach the learner.</td>
</tr>
</tbody>
</table>

**Traditional Philosophy**

- Largely based on the In-Training Evaluation Report (ITER)
- Mid-Unit and End of Rotation
- Satisfactory
- Provisional Satisfactory
- Unsatisfactory
- Time based e.g., completed 2 blocks of Internal Medicine, 2 blocks of ICU etc., PGY1, PGY2, PGY3 etc.
- At the end of training. Successful completion of the certification examination and they are consultant in their discipline.
- To assess and teach the learner.

**CBD Philosophy**

- Largely will be based on work based assessments
- In the moment is optimal
- Didn’t need to be there
- Needed to be there just in case
- Needed to Prompt
- Had to talk them through
- I had to do
- Outcome based e.g., completion of the EPA’s for each stage.
- Transition to Discipline Foundation Core Transition to Specialty
- PGY levels will be for pay only.
- At the end of Core. Will not be certified until they complete the EPA’s for Transition to Specialty.
- To teach / coach the learner.
Competency Based Medical Education Committee Structure: PGME, McMaster University

**CBME EXECUTIVE:**

The committee is responsible for the overall oversight and strategic planning for the implementation of Competence By Design in the RCPSC programs at McMaster University as well as ensuring that there is overall alignment with the CFPC. Working groups will be set up to facilitate the implementation of CBME. Subcommittees report to the CBME Executive, who reports to the Assistant Dean, PGME.

**Subcommittees:**

- Assessments (with subcommittee on Information Technology)
- Scholarship
- Faculty Development
- Learner Development

**CBME NETWORK INFORMATION GROUP:**

The CBME Information Network is a group of representatives of key stakeholders in the Postgraduate Medical Education enterprise. This group will endeavor to share information with other members of the group as well as provide information to their own constituents. See Appendices 1 and 2 for Terms of Reference.
Frequently Asked Questions:

Will CBD be time-free?

“Pure” Competency based medical education is time free; however the RCPSC’s Competence by Design is a hybrid model of CBME. It is not time free. Instead, CBD will re-conceptualize time as a framework.

Within CBD, the number of hours need to complete a residency program is not expected to change for the majority of residents. Residents will have the ability to achieve competencies (measured by Entrustable Professional Activities (EPA’s) / milestones) at their own rate within the defined residency program timeframe.

How will CBD affect learners?

- more frequent assessment and meaningful supervision of expert faculty
- clearly defined targets for acquiring competency and meeting standards throughout training, to guide progression to next stage of training
- a more flexible timeframe, which focuses on personal development
- the ability to continuously strive towards excellence throughout practice.

If the exam moves earlier, does this mean trainees are ready for independent practice earlier?

No. The examination will become a milestone in the ‘Transition to Practice’ and one of a number of requirements for certification. Passing the exam at the end of the ‘Core of Discipline’ stage will not lead to certification. The RCPSC will only grant certification when the resident has successfully completed the ‘Transition to Practice’ stage and has received sign off from the Program Director.

What does the RCPSC rollout schedule look like and how does that affect learners already in the residency programs?

The Royal College is taking a phased approach to CBD rollout and implementation. It is anticipated that all specialty and subspecialty programs in Canada will adopt CBD in gradual phases – a transition that will occur until 2022.

**Cohort 1:**
- Medical Oncology – Anticipated launch date: July 2018
- Otolaryngology – Head and Neck Surgery – Launch date: July 2017 for PGY1 cohort

**Cohort 2:**
- Anesthesiology – Launch date: July 2017 for PGY1 cohort
- Forensic Pathology – Launch date TBA
- Gastroenterology – Launch date TBA
- Internal Medicine – Launch date TBA
- Surgical Foundations - Launch TBA
- Urology – Launch date TBA
**Note:** the date on the chart below indicates the ‘**Cohort Initiation Date**’ i.e., refers to the point at which a discipline begins the CBD transformation process by beginning their Royal College workshops to co-create new specialty-specific standards. Cohort launch date refers to the point at which a discipline implements CBD in the training program, aligned with the academic year.

![Proposed CBD Rollout Schedule: All Residency Programs](image)

<table>
<thead>
<tr>
<th>2016 (Cohort 3)</th>
<th>2017 (Cohort 4)</th>
<th>2018 (Cohort 5)</th>
<th>2019 (Cohort 6)</th>
<th>2020 (Cohort 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomic Path.</td>
<td>PMR</td>
<td>Neurology</td>
<td>Medical Gen.</td>
<td>Interventional Rad.</td>
</tr>
<tr>
<td>Nephrology</td>
<td>Geriatrics</td>
<td>Forensic Psych</td>
<td>ID</td>
<td>Occupational Med.</td>
</tr>
<tr>
<td></td>
<td>Adolescent Med.</td>
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References:

Appendix 1: Competency Based Medical Education (CBME) Executive Committee

Terms of Reference

The CBME Executive Committee is accountable to the Assistant Dean, Postgraduate Medical Education, Faculty of Health Sciences. The committee is responsible for the overall oversight and strategic planning for the implementation of Competency By Design in the RCPSC programs at McMaster University as well as ensuring that there is overall alignment with the CFPC. Working groups will be set up to facilitate the implementation of CBME.

The directions of CBME will endeavor to adhere to the mission and policies of the Michael G. DeGroote School of Medicine. The Executive Committee is responsible for strategic planning in all areas related to competency based medical education at McMaster University, including but not limited to:

- Relations with the Royal College of Physicians and Surgeons of Canada to ensure that the committee has a clear understanding of the RCPSC vision of Competence By Design.
- Relations with the College of Family Physicians of Canada to ensure that ongoing CBME initiatives are supported by PGME.
- Resources / infrastructure that will enable the successful adoption of competency by design at McMaster. This includes both physical and human resources.
- Support strategies for faculty, learners and administrative staff.
- IT strategy at McMaster that will support the implementation of CBD and will integrate with the national platform.
- Proposing and drafting new policies as needed to support competency based medical education.
- Available for consultation re existing policies as it relates to competency based medical education.
- Promoting scholarly activity related to CBME.

Core Membership:
- Director, CBME (Chair)
- Project Manager, CBME
- Faculty leads of working groups as they are defined e.g., faculty development, assessment, scholar
- Resident representation
- Program Director, Family Medicine or delegate
- Royal College Program Directors (2)
- Assistant Dean, Postgraduate Medical Education
- Director, IT, Faculty of Health Sciences

The committee will meet on a regular basis (e.g., monthly). An agenda will be developed and minutes circulated to all committee members. A quorum is represented by half of the membership of the committee. Decisions are to be made by consensus.

Working Groups will be struck at the direction of the CBME Executive.

Final ToR: Approved at PGEC November 16, 2016
Appendix 2: Competency Based Medical Education (CBME) CBME Information Network

Terms of Reference

The CBME Information Network is a group of representatives of key stakeholders in the Postgraduate Medical Education enterprise. This group will endeavor to share information with other members of the group as well as provide information to their own constituents.

The purpose of this group is to:

- Provide a forum that will promote innovation and efficiencies in the development of CBME at McMaster. This could be in terms of new projects, awareness campaigns etc.
- Align key principles for the implementation of CBME in postgraduate medical education at McMaster.
- Create a repository of innovations and scholarly activities, related to CBME, taking place within Postgraduate Medical Education.
- Create a network of individuals who are well informed on the postgraduate plan for the CBD implementation so that they are able to advise PGME leadership on critical points of impact for their particular stakeholder group. These individuals shall represent their constituent group. Other individuals may be invited at the Chair’s discretion.

Membership:
- Director, CBME (Chair)
- Project Manager, CBME
- Faculty leads of working groups as they are defined e.g., faculty development, assessment, scholar
- Resident representation (3)
- Program Director, Family Medicine or delegate
- Royal College Program Directors (3)
- Program Administrators (3)
- Chair, representative
- Associate Dean, Health Professional Education
- Assistant Dean, Postgraduate Medical Education
- Assistant Dean, Undergraduate Medical Education or delegate
- Assistant Dean, Faculty Development
- DEC representative
- Director, Education Services
- Departmental Administrative Director representative
- Representation from Medportal
- Representation from MedSIS
- Hospital Representative(s)
- Regional Campus representative
- Royal College educators

The CBME Network Group will meet approximately 3 times a year or as required at the call of the Chair. An agenda will be developed and minutes circulated to all committee members. This is not a decision making body but may make recommendations that would be forwarded to the CBME Executive

ToR final: Approved at PGEC November 16, 2016