



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

A Guide to CBME / CBD
Version 2.1

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Table of Contents:

PREAMBLE	2-3
TERMINOLOGY AND DEFINITIONS	3-5
GOALS OF CBME	5-6
CORE COMPETENCIES OF CBME	6-8
COMPETENCE CONTINUUM – STAGES OF TRAINING AND BEYOND	9
COMPARISON TRADITIONAL MODEL VERSUS CBD MODEL	10
ENTRUSTABLE PROFESSIONAL ACTIVITIES (EPAS) AND MILESTONES.....	11-12
CBME FROM A RESIDENT'S PERSPECTIVE	13
COACHING AND FEEDBACK	14
THE COMPETENCE COMMITTEE: AN OVERVIEW	15-16
COMPETENCY BASED MEDICAL EDUCATION COMMITTEE STRUCTURE: PGME, MCMASTER UNIVERSITY	17
FREQUENTLY ASKED QUESTIONS	18
CONTACT INFORMATION	19
ADDITIONAL RESOURCES.....	19

Preamble

This is a guide to some of the basic concepts and terminology of Competency Based Medical Education. If you are interested in more indepth information please refer to our website: <https://cbmepg.mcmaster.ca/>

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.

Part of the mandate of the CBME office is to provide an infrastructure for competency based medical education in postgraduate medicine at McMaster. To date, the following guidelines have been approved and disseminated, to help programs develop their own infrastructure. These guidelines can be found on the website under Resources.

1. Competence Committee (CC) suggested guidelines to develop your Terms of Reference
2. Competence Committee suggested guidelines – Process and Procedures – how to run your CC.
3. Academic Coach – suggested guidelines for a job description
4. Competency based medical education Program Lead – suggested guidelines for a job description
5. Education plan templates
6. Curriculum Mapping templates
 - a. Year at a glance
 - b. Direct mapping
 - c. Reverse mapping

A critical component to the success of the implementation of competency based medical education is the electronic assessment platform that will facilitate in-the-moment work based assessments and collate the information for the competence committees. MedSIS has been selected as the platform that will support CBME at McMaster - considerable groundwork has been done to date and much more in the works. Regular updates are being provided to stakeholders.

July 2017, two specialties – Anesthesiology and Otolaryngology – went live with Competence by Design for their incoming PGY1 cohort. July 2018, Emergency Medicine (Adult), Forensic Pathology, Medical Oncology, Nephrology, Surgical Foundations and Urology are the next cohort of programs.

July 2019 programs have been approved for launch:

- (i) Anatomical Pathology
- (ii) Cardiac Surgery
- (iii) Critical Care – Adult
- (iv) Critical Care – Pediatrics
- (v) Gastroenterology – Adult
- (vi) Gastroenterology – Pediatrics
- (vii) General Internal Medicine
- (viii) General Pathology
- (ix) Geriatric Medicine
- (x) Internal Medicine

- (xi) Neurosurgery
- (xii) Obstetrics & Gynecology
- (xiii) Radiation Oncology
- (xiv) Rheumatology

Proposed 2020 programs at McMaster, pending approval are:

- (i) Cardiology (Adult)
- (ii) General Surgery
- (iii) Neonatal-Perinatal
- (iv) Physical Medicine & Rehabilitation
- (v) Psychiatry
- (vi) Respiriology (Adult)
- (vii) Clinical Immunology & Allergy (Adult and Pediatrics)
- (viii) Neurology (Adult)
- (ix) Pediatric Neurology
- (x) Orthopedic Surgery
- (xi) Pediatric Hematology Oncology
- (xii) Pediatric Surgery
- (xiii) Pediatrics
- (xiv) Plastic Surgery
- (xv) Vascular Surgery

Terminology and 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>). 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: **C**omprehensive, focused on **C**ontinuity of education and patient care and **C**entred 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.

Core of Discipline (Stage 3):

This stage covers the core 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).

Chair, Competence Committee:

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.

Observer / Coach in the moment (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 Resident. However, faculty will be asked to complete more 'in-the-moment' work based assessments. The expectation will be that faculty will provide coaching / formative assessment to the resident.

Academic Coach / Coach over time:

The RCPSC has recommended that Residents have an academic coach to mentor them in their development.

CBD Program Lead:

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.

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 resident'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

Core Component of CBME	Features of CBD
<p>1. FRAMEWORK: Competencies are clearly articulated</p>	<ul style="list-style-type: none"> ▪ 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
<p>2. PROGRESSION: Competencies are sequenced progressively</p>	<ul style="list-style-type: none"> ▪ 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.
<p>3. TAILORED EXPERIENCES: Learning experiences facilitate progression</p>	<ul style="list-style-type: none"> ▪ 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 between time-free / time-dependent approach of competency-based medicine with timed rotations. ▪ A de-emphasis on time to ensure that learning experiences are organized to immerse the resident in authentic practice conditions.
<p>4. COMPETENCY FOCUSED INSTRUCTIONS: Teaching practices promote progression</p>	<ul style="list-style-type: none"> ▪ Learning guided by real-time, high quality feedback from multiple observations. ▪ EPAs to structure learning and focus instruction (in contrast to extemporaneous approaches). ▪ Clinical Supervisors / observers act as coaches for the purpose of improvement, with repeated focused observation and feedback.

5. PROGRAMMATIC ASSESSMENT: Assessment practices support and document progression

- **Assessment for Learning:** Competency-based assessment focused on **EPA observations in the workplace.**
- **Assessment for Progression:** Promotion decisions and certification is accomplished on successful completion of EPAs and progression through stages of training, and is to be determined by a **Competence Committee** responsible for regular review of resident progress using highly integrative data from multiple EPA and milestone observations and feedback in clinical practice.
- **Changes to the certification examination:** 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.
- An **electronic portfolio** to demonstrate and record developments in competence and independence

Competence Continuum – Stages of Training and Beyond



Comparison Traditional Model versus CBD Model

	Traditional	CBD
Philosophy	Assessment OF Learning	Assessment FOR Learning
Assessment type	Largely based on the In-Training Evaluation Report (ITER).	Largely will be based on work based assessments.
Timing of the Assessment	Mid-Unit and End of Rotation.	In the moment.
Assessment scale	<ul style="list-style-type: none"> • Satisfactory • Provisional Satisfactory • Unsatisfactory 	<ul style="list-style-type: none"> • 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
Promotion	<p>Time based e.g., completed 2 blocks of Internal Medicine, 2 blocks of ICU etc.</p> <p>PGY1, PGY2, PGY3 etc.</p>	<p>Outcome based e.g., completion of the EPA's for each stage.</p> <p>Transition to Discipline Foundation Core</p> <p>Transition to Specialty</p> <p>PGY levels will be for pay only.</p>
RCPSC examination	At the end of training. Successful completion of the certification examination and they are consultant in their discipline.	At the end of Core. Will not be certified until they complete the EPA's for Transition to Specialty.
Role of Supervisor	To assess and teach the resident.	To teach / coach the resident.

Entrustable Professional Activities & Milestones



Key Concept of ENTRUSTMENT

Assessment is the process of gathering and analyzing information in order to measure a physician's competence or performance, and compare it to defined criteria. Though Entrustable Professional Activities (EPAs) will be the mainstay of competency based medical education, programs should maintain a holistic approach to assessment. Use of multiple methods of assessments should continue to be employed by programs to gather the best evidence of learner progression.

Entrustable Professional Activity (EPA)

An essential **task** of a "discipline" that an individual can be trusted to perform independently in a given context.

Milestones

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

Milestones within an EPA

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.

A Royal College **EPA** is an encompassing task 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**.

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.

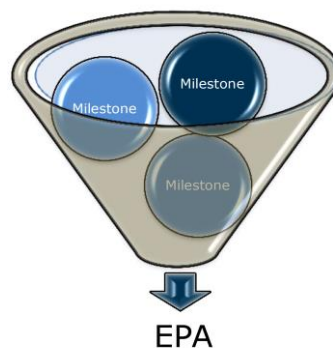
Example:

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.

Can EPA's be used for clinical tasks + non-clinical tasks? Absolutely!

There are many pieces of knowledge, skills and tasks that feed into a fulsome understanding of the modern physician.

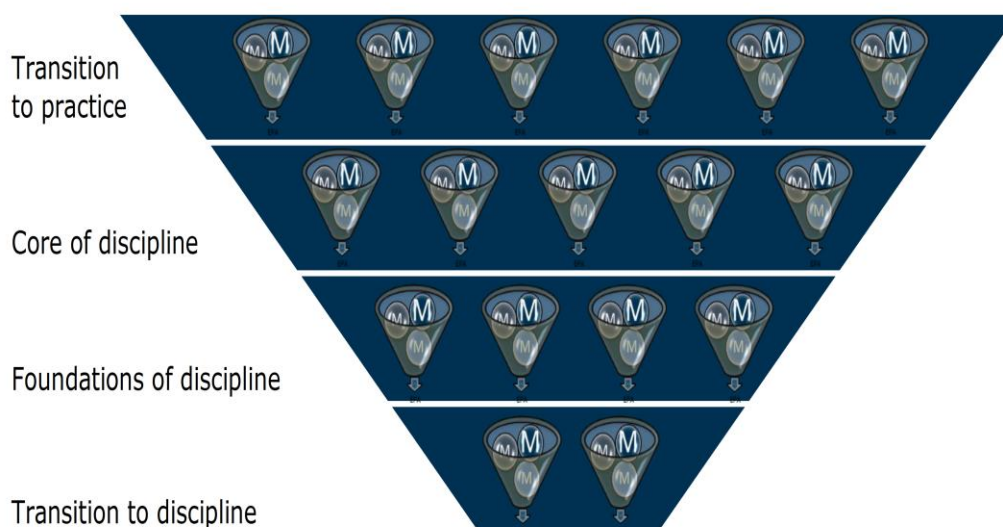
Originally, EPA's were envisioned as pertaining to clinical tasks only. The Royal College's CBD model recognizes non-clinical tasks that are a part of medicine. Both clinical and other tasks, such as quality improvement, teaching and scholarly work are considered to be essential tasks of a specialty physician and require an element of entrustment and are therefore eligible for EPA.



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.



CBME from a Resident's Perspective

Residents in competency based medical education will take **ownership of their own learning**. The Resident will play a big role in the planning of their own learning experiences and tracking their own progress against the EPAs and milestones.

Current residency education in Canada is based on the assumption that the more time a resident spends on an activity, the more the learner absorbs and excels. However, not all residents achieve mastery at the same rate. For this reason, in a competency based medical education model, residents may progress through their residency at different rates. This being said, generally speaking, we don't anticipate the length of residency will change for the majority of residents. The intention is not to shorten or lengthen training but to create competent residents who are ready for practice.

In the CBME environment, residents will be **proactive and share the responsibility** of ensuring that they are receiving an adequate number of assessments in addition to meaningful feedback, in a variety of environments, in order to have their EPA's properly assessed by the Competence Committee.

CBD Benefits for the Resident

The systems, milestones and resources created for CBD will provide learners with:

- More frequent assessment and meaningful feedback from faculty,
- Well-defined learning paths and clarity around the competencies needed to progress to next stages of training,
- A learning plan that focuses on personal development,
- The chance to prepare for independent practice by honing skills and working more independently during the final stage of residency.



**Key concept of
OWNING IT!**

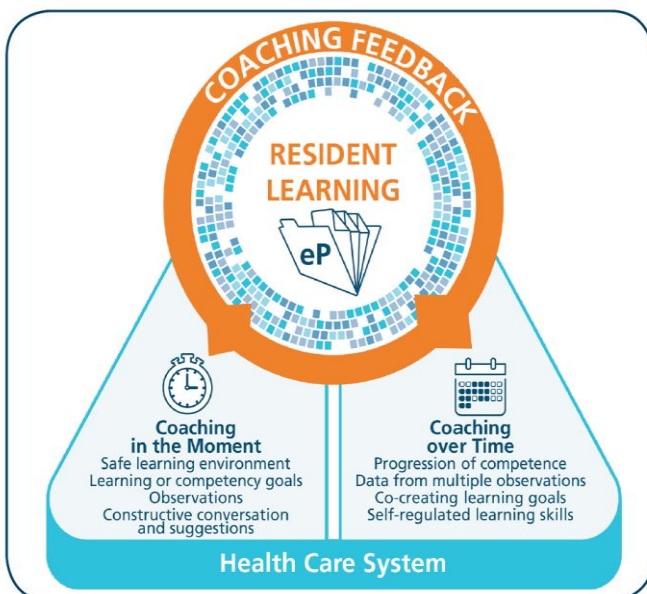
Coaching and Feedback



Key concept of COACHING IN THE MOMENT

Coaching in the moment requires clinicians to establish rapport and set expectations with their residents, observe their residents doing their daily work, provide coaching feedback, and document the encounter. Frequent observation is key ingredient in resident learning and assessment.

Coaching over time is a relatively new concept to postgraduate medical education. Some programs are using **Academic Coaches** to develop a longitudinal relationship between a faculty member and a resident. This educational partnership requires regularly scheduled face-to-face discussions about the resident's progression toward competence.



This is a graphic representation of the coaching model that has been developed to support resident learning and progressive competence development in the Royal College model of Competence by Design.

Resident learning is the focal point and reflects the importance of a learner-centred, development approach to competency acquisition.

Coaching feedback is the prominent method to facilitate the learning and development.

The Competence Committee: An Overview

Competence committees are critical components of competency based medical education that allow for robust and transparent resident performance review. Their goal is to ensure all residents achieve the requirements of the discipline through synthesis and review of qualitative and quantitative assessment data at each stage of training, and to provide recommendations on future learning activities.

Role

A competence committee reviews and makes recommendations to the Program Director and Residency Program Committee (RPC) related to the progress of residents. The RPC ratifies the resident status recommendations.

Responsibilities

The overall responsibility of the Competence Committee, but is not limited to, is to synthesize the results from multiple assessments and observations to make recommendations related to promotion from stage to stage. To determine when an enhanced education plan is required.

Composition

The Competence Committee will be composed of individuals with interest and experience in assessment and medical education relevant to the discipline. The Program Director will be a member of the competence committee but is not the Chair of the committee. The membership of the committee will be at the discretion of the Residency Program Committee and the Program Director.



The literature supports that groups make better decisions.

Resources:

1. PGME Suggested Guidelines – Terms of Reference – <https://cbmepg.mcmaster.ca/>
2. PGME Suggested Guidelines – Process and Procedures – <https://cbmepg.mcmaster.ca/>
3. RCPSC Competence Committee Cases to help train your Competence Committee
http://www.royalcollege.ca/mssites/casescenarios_en/story_html5.html
4. Helpful articles regarding competence committee
 - Steinert Y. The 'problem' learner: whose problem is it? AMEE Guide No. 76. Medical teacher. 2013 Apr 1;35(4):e1035-45. <https://www.bmj.com/content/336/7636/150>
 - Chan T, Sebok-Syer S, Thoma B, Wise A, Sherbino J, Pusic M. Learning Analytics in Medical Education Assessment: The Past, The Present, and The Future. AEM Education and Training. 2018; 2(2); 178-187. <https://onlinelibrary.wiley.com/doi/abs/10.1002/aet2.10087>
5. RCPSC: How Competence Committees deliberate
<http://www.royalcollege.ca/rcsite/cbd/assessment/committees/competence-committees-how-they-deliberate-e>



➤ **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. Subcommittees have been structured to facilitate the implementation of CBME. Subcommittees report to the CBME Executive, who reports to the Associate Dean, PGME.

Subcommittees:

- **ASSESSMENT (with subcommittee on Information Technology)**
- **SCHOLARSHIP**
- **FACULTY DEVELOPMENT**
- **LEARNER DEVELOPMENT**
- **PROGRAM ADMINISTRATORS**

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 the residents?

- 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.

How will CBD affect the Clinical Supervisors / Observers?

Going forward residents will start to think of their clinical supervisors / observers as a coach, someone who helps them develop their skills. The clinical supervisor / observer will incorporate both direct and indirect observation into their work on a regular basis and in a way that is practical for the reality of their environment. The clinical supervisor / observer will give short focused feedback to the residents and complete brief records of the observed performance.

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 residents already in the residency programs?

The Royal College is taking a phased approach to the 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. Once a specialty is approved to move forward, all Canadian residency programs of that specialty will move at the same time. The program will recruit the CBD residents into their first year of training. Therefore, there will be two cohorts of residents in our programs: CBD and Traditional – this will last until all the Traditional residents complete their residency program.

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Additional Resources:

1. <http://www.royalcollege.ca/rcsite/competence-design-e>
2. http://www.cfpc.ca/Triple_C/

Royal College of Physicians and Surgeons of Canada: EPA's and Milestones

1. [Understanding Entrustable Professional Activities \(Video\)](#)
2. [Milestones and EPAs in the Royal College CBD Model – Introduction \(Video\)](#)
3. [Entrustable Professional Activity \(EPA\) Fast Facts](#)