ROYAL COLLEGE
OF PHYSICIANS AND SURGEONS OF CANADA
COLLÈGE ROYAL
DES MÉDECINS ET CHIRURGIENS DU CANADA

Competence by Design
PROGRAM EVALUATION

Competence by Design (CBD) Implementation Pulse Check

CBD Program Evaluation Operations Team
Spring 2020

Table of Contents

Executive Summary

Introduction

This report outlines the findings of a study conducted by the Royal College CBD Program Evaluation Operations Team to understand how CBD implementation is going on the ground, as well as benefits, challenges, advice for moving forward, and any early outcomes. This study primarily examines fidelity of implementation at the 6-month mark, which is the extent to which critical components of CBD are present in a program, as well as the occurrence of some very early outcomes. Information gathered in this study will allow for the monitoring of trends in CBD implementation over time, and will ensure lessons learned and necessary adjustments are systematically incorporated into subsequent cohorts implementing CBD.

This study involved a survey to measure a program's overall implementation, implementation of key features of CBD, methods and topics of faculty development, benefits, challenges, and advice for moving forward. 44.1% (79/179) of programs completed the survey. A subset of these respondents (15 programs) also participated in a follow up interview to delve more deeply into their experience.

Key Findings

Overall Implementation and Key Features of Implementation

More than 60% of participants agreed or strongly agreed that, overall, CBD implementation was going well. When asked about specific features of CBD implementation, most programs were on their way to full implementation, and all programs have started to implement most of the key features to at least some degree. Competence Committees were implemented most fully, whereas individualized resident stage-based learning was still in the process of being adopted by many programs.

Faculty Development

The most common faculty development methods were workshops, emails, and grand rounds. Respondents felt that on the ground, hands-on faculty development was very effective. Faculty development topics included "What is CBD" and the how-to for on the ground work. Respondents felt that faculty received information well when it was delivered in bite sized pieces or in "just -in-time training."

Challenges and Benefits

The most common challenges participants faced were around the time and resources required to prepare for and implement CBD, the difficulties encountered in completing EPAs, and the functionality of electronic platforms, particularly around the ability to extract useful information for competence committee review. Culture change, for both faculty and residents, was also a common challenge.

The most common benefits participants found were residents receiving more frequent and better feedback, a more objective review of residents, catching struggling residents earlier, and better engagement of residents and faculty.

Key Takeaways and Recommendations

The majority of programs who responded to the survey have at least begun to implement most, if not all key features of CBD and, thus, are adhering to the fidelity of implementation (i.e. implementing the core characteristics of CBD).

Integrity of implementation is about the extent to which the essential principles of CBD have been adopted into practice. It is possible to adopt a feature related to CBD e.g., establish a competence committee, but not actually change the underlying patterns of behaviour or shared assumptions e.g., shift from a fixed to a growth mindset. Many programs see this culture shift as an important part of CBD, and appear to be working towards it. However, for many programs, the culture shift is still a work in progress.

This study did find some early outcomes, both positive and negative. It will be important to monitor these outcomes and implement changes where needed to ensure CBD is achieving what was intended, and not having a detrimental effect. The table below reflects some of these early outcomes.

Positive	Negative
• Identifying struggling and accelerating residents earlier • Enhanced engagement of faculty in medical education • Residents taking more ownership of their learning	• Some programs are experiencing strain on resources in terms of the time and effort devoted to preparing for and implementing CBD • Some trainees describe CBD as having a negative impact on wellness

Based on the findings in this study, **some key recommendations** were developed.

Monitor outcomes

The monitoring of outcomes should continue as CBD implementation occurs, and outcomes should be explicitly studied. This will ensure CBD is being implemented as intended, and is not having any unintended, detrimental effects. Any unintended, negative outcomes, such as the ones found in the study, should be closely monitored and adaptations made to counteract the negative effects when necessary.

Identify opportunities for enhanced collaboration

As disciplines continue to implement Competence by Design, it will be useful to learn from other programs and disciplines. Identifying opportunities for collaboration and sharing best practices will be important, both within and across disciplines.

Promote the completion of EPAs

Determining how best to support and encourage both faculty and residents to complete EPAs should be considered. This may include directing faculty to developmental resources (such as coaching and feedback modules) or providing residents with the support they need to increase their confidence in approaching faculty with requests for observations and feedback.

Provide support around electronic platforms

Regardless of the platform being used, programs are experiencing challenges with electronic platforms. Efforts should be made to ensure adequate support it is available to faculty and programs, whether it is ensuring everyone has access to the system (including off-service faculty), making sure the proper technological support in place, or offering education/improvements on how to optimize the platforms to extract and present data for reviewing resident progression. Collaboration and discussion between programs using similar platforms may be a way of learning from each other's challenges and solutions.

Support updates and improvements to EPAs and milestones

As programs implement CBD, it will be important to facilitate and support Specialty Committees in making iterative changes and improvements to EPAs and milestones when needed. It will also be important to keep track of challenges previously encountered and use them to guide new disciplines in their EPA and milestone development.

Monitor time required, resources, and impact on wellness

The additional time and effort for some program directors, faculty, residents, and program administrators as they prepare for, support, and engage in CBD implementation may have an impact on wellness. It will be important to monitor the time and resources required at any given time going into CBD to ensure that no one is experiencing burnout or excessive stress. The impact on resident wellness was studied in this report, and will continue to be monitored going forward to determine if any negative impacts on health and wellness are longitudinal in nature or specific to the time. Future studies should also consider exploring the impact of CBD on wellness with program directors, faculty, program assistants, and any others who are heavily involved in CBD implementation.

Acknowledge that change is a process

Competence by Design has not been fully embraced by everyone involved in its implementation. There are many who are involved only because it has been mandated at the national level and are not necessarily convinced by the need for change. To encourage a shift in culture, it will be important to continue to share the rationale for CBD and to promote the adoption of a growth mindset, acknowledging that change takes time.

Utility of findings

It will be important to continuously monitor the utility of the findings that are coming out of this report and other studies looking at the implementation of CBD. This will mean engaging with those who receive the report to determine the usefulness of the information received and to better understand how it may be used to make improvements to their own programs, committees, or faculties. This will help inform future iterations of the survey and the questions asked during interviews to better support programs moving forward.

CBD Pulse Check Report

Background

Competence by Design (CBD) is the Royal College of Physicians and Surgeons of Canada's major change initiative to reform the training of medical specialists in Canada. It is based on a global movement known as Competency Based Medical Education (CBME), and is led by the medical education community. The objective of CBD is to ensure physicians graduate with the competencies required to meet local health needs, and it aims to enhance patient care by improving learning and assessment in residency. It will eventually be implemented across the continuum from residency to retirement.

In CBD, progression of competence occurs within a structured but flexible curriculum consisting of five core components (Appendix A). More specifically, in a competency-based approach, competencies required for practice form a **framework** and are accordingly organized into a **progressive sequence**. Promoting resident progression forms the basis for the design of all curricular elements: **learning experiences that are tailored** to the acquisition of competencies, **instruction that is competency-focused** and **assessment that is programmatic** in approach (Van Melle et al., 2019). For more information on CBD, please visit the Royal College website.

CBD is being implemented across the system of specialty medicine in Canada in stages. The first disciplines launched in July 2017, and on July 1st each year, additional disciplines implement CBD. As of July 1st, 2019, 12 more disciplines launched; these disciplines are the focus of the current report.

CBD Program Evaluation

The purpose of this study is to contribute to the longitudinal program evaluation of CBD. CBD is a complex initiative and the program evaluation will require a systematic, longitudinal approach that continuously monitors implementation, challenges, and opportunities for improvement. Many projects will be undertaken over the course of the evaluation.

The program evaluation will help to answer specific questions about CBD for the purpose of decision making, including if CBD is being implemented as intended, identifying areas for improvement and understanding program impacts (Van Melle, Frank, Brzezina, & Gorman, 2017).

The CBD program evaluation has three goals, each of which is addressed by a pillar of the evaluation.

1. **To foster successful implementation of CBD.**

It is important to understand what factors influence a successful implementation (Durlak & DuPre, 2008). This goal will be addressed by the readiness to implement pillar. Readiness to implement

examines an organization's resolve (beliefs, attitudes, and intentions) and capacity (capabilities, resources, structure) to implement CBD (Scaccia, 2016).

2. **To understand the influence of local contexts, adaptations and innovations.**

Local sites will adapt CBD to fit their local context, and it is important to understand these adaptations to determine if there is a point where they compromise the fundamental principles of CBD. Without understanding this, we cannot determine if a lack of impact is from poor implementation or inadequacies in program theory (Palacios et al., 2016). This goal will be addressed by examining fidelity of implementation (the extent to which critical components of CBD are present in the program) (Century, Rudnick, & Freeman, 2010) and integrity of implementation (the extent to which the program embodies the qualities of CBD that will lead to desired outcomes over time) (Patton, 2016).

3. **To build an evidence base of the impact of CBD-Residency Education overtime.**

It is important to understand the impact of CBD, and what it is about CBD that works, for whom, in what circumstances, and why (Pawson et al., 2005). To meet this goal, short, medium, and long-term, as well as unintended outcomes will be examined overtime.

For more information on the program evaluation initiative, please email educationstrategy@royalcollege.ca.

Focus

The Pulse Check was conducted to monitor the implementation of CBD across the system of specialty medicine in Canada. Results were used to explore the status of CBD implementation, to gain a better understanding of the challenges and opportunities for improvement in implementation, to examine early outcomes, and to gather advice for moving forward.

In relation to the Program Evaluation pillars, the Pulse Check will focus primarily on fidelity of implementation, and touch on integrity of implementation, by examining the degree to which key features of CBD are implemented, and how they have been implemented in programs. It will also examine early outcomes through current benefits and challenges in implementation.

The information gathered from this study will allow the monitoring of trends in CBD implementation across the system of specialty medicine in Canada overtime, and will ensure lessons learned and necessary adjustments are systematically incorporated into subsequent cohorts implementing CBD.

Methods

Participants of this study were program directors or program CBME leads of the 2019 CBD launch disciplines. Participants were contacted by email and asked to participate in an online survey, and were asked at the end of the survey if they would like to participate in a follow up interview. The survey response rate was 44.1% (n = 79) and 15 respondents participated in a follow-up interview. (see Table 1). Interviews were spread out across programs and Faculties of Medicine for maximum representation.

Specialty	Survey Response Rate	Number of Interviews
Anatomical Pathology	35.7% (5/14)	1
Cardiac Surgery	27.3% (3/11)	0
Critical Care Medicine (Adult)	38.5% (5/13)	2
Critical Care Medicine (Pediatric)	37.5% (3/8)	0
Gastroenterology (Adult)	28.6% (4/14)	1
Gastroenterology (Pediatric)	28.6% (2/7)	0
General Internal Medicine	31.3% (5/16)	2
General Pathology	33.3% (2/6)	1
Geriatric Medicine	36.4% (4/11)	0
Internal Medicine	52.9% (9/17)	2
Neurosurgery	78.6% (11/14)	1
Obstetrics and Gynecology	62.5% (10/16)	1
Radiation Oncology	46.2% (6/13)	3
Rheumatology (Adult)	60.0% (9/15)	1
Rheumatology (Pediatric)	25.0% (1/4)	0

Table 1. Survey and interview response rates by program.

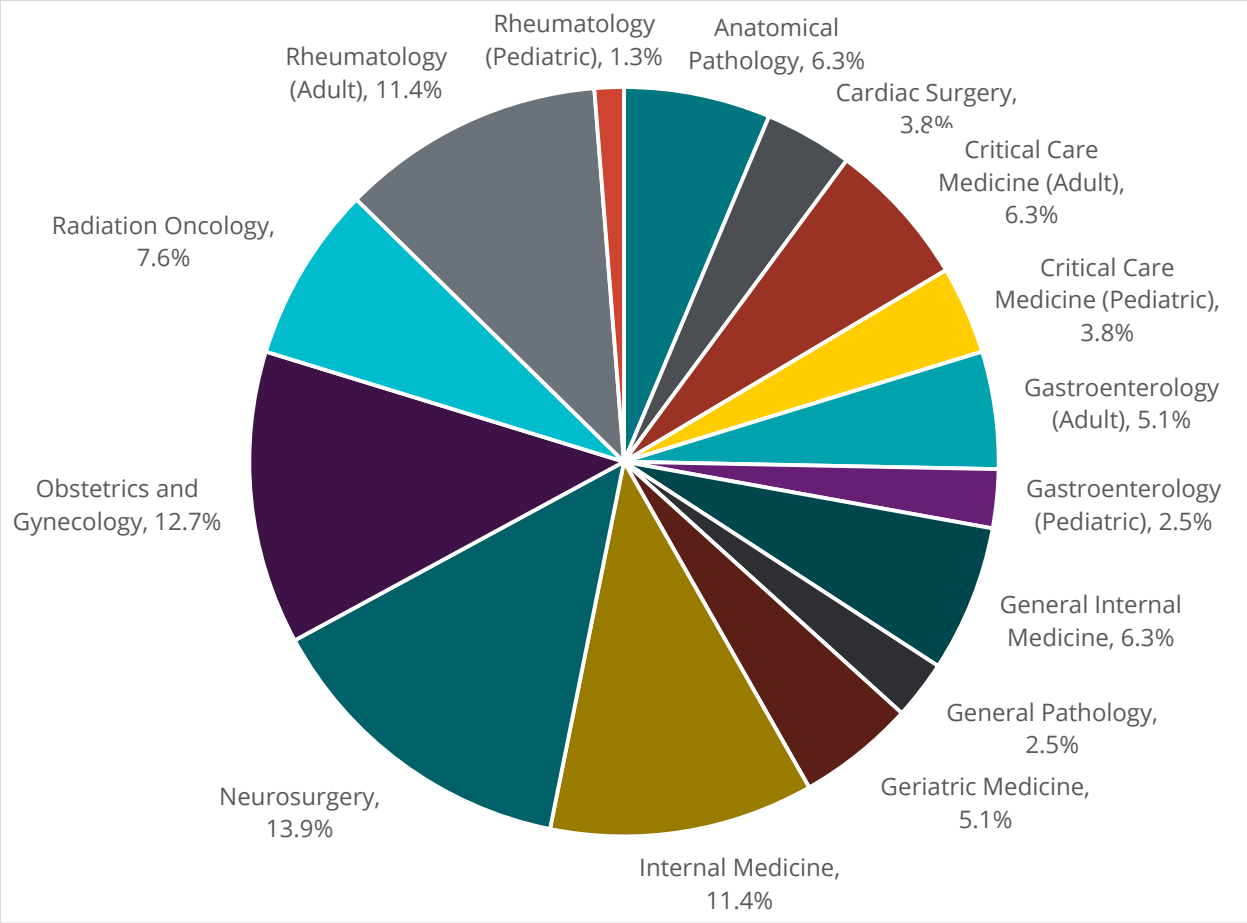

Figure 1. Distribution of Survey Responses.

ONLINE SURVEY

In January 2020, Program Directors of 2019 CBD launch disciplines were sent an email requesting their participation in a brief online survey with the intent of obtaining an overall sense of how CBD implementation was going in their program (Appendix B). The survey was conducted through Survey Gizmo. The survey was open for 5 weeks, and participants received two reminder emails, the first at two weeks and the second at four weeks.

The survey was divided into 4 parts developed collaboratively by the CBD Program Evaluation Operations team (Appendix D) consistent with the overall objectives above. The survey was developed through an iterative approach and was ultimately piloted on a representative sample using a think aloud protocol. Recommendations gathered from the pilot were assembled and incorporated into the final survey (Appendix B).

Part one of the survey asked respondents to rate how CBD implementation had gone for their program until that point on a scale from one to five.

The second part of the survey specifically addressed the implementation of the key components of CBD. An innovation configuration map approach was utilized to identify not only the key components of CBD, but also as a means of defining what those key components would look like when they had been fully implemented (Richardson, 2004). Innovation configuration mapping is

particularly useful in making clear what a new program such as CBD (the innovation) is, and what it is not (Richardson, 2004). For each of the key components, a scale of one to five was utilized that characterized the component from non-implementation to ideal implementation respectively. While innovation configuration maps can be used for multiple purposes, in this case respondents use it as a form of self-evaluation that assessed degree of implementation (Richardson, 2004).

Part three of the survey addressed faculty development as it related to CBD. Respondents were asked about what topics had been provided to faculty, how those topics had been delivered, and what resources had been used.

Finally, in part four of the survey, free text boxes were used to explore the benefits of CBD implementation, the challenges of implementation, ways that those challenges had been overcome, and any advice for moving forward. New to this iteration of the survey was an additional question that asked about how CBD has impacted resident wellness. Previous reports have suggested residents' wellness might be negatively affected by CBD, therefore, this was considered something that would important to monitor and measure going forward.

INTERVIEWS

At the conclusion of the survey, respondents were asked if they were interested in participating in a follow-up interview to delve more deeply into their experience with CBD thus far. A complementary interview guide (Appendix C) was assembled that consisted of twelve primary questions and associated prompts. Questions addressed themes similar to the survey including implementation and faculty development, but put additional focus on the benefits, challenges, and associated recommendations that respondents had compiled based on their experience with CBD. This guide was similarly created through an iterative approach by the CBD Program Evaluation Operations team.

Those who agreed to participate in an interview were contacted and polled for their availability. The interviews typically lasted between 30-45 minutes. One interviewer and one note-taker were present for most interviews. The interviewers were members of the CBD Program Evaluation Operations team who are not directly involved in CBD implementation.

Results

Overall Implementation and Features of CBD

Key takeaways

- More than 60% of respondents indicated that CBD implementation in their local program was going well
- When asked about specific features of CBD implementation, Competence Committees were implemented most fully, whereas many respondents had not fully implemented individualized resident stage-based learning.

Survey respondents were asked how much they agreed with the statement "Overall, CBD implementation is going well in my local program" on a five-point scale from strongly disagree (1) to strongly agree (5). More than 60% of respondents agreed or strongly agreed with this statement.

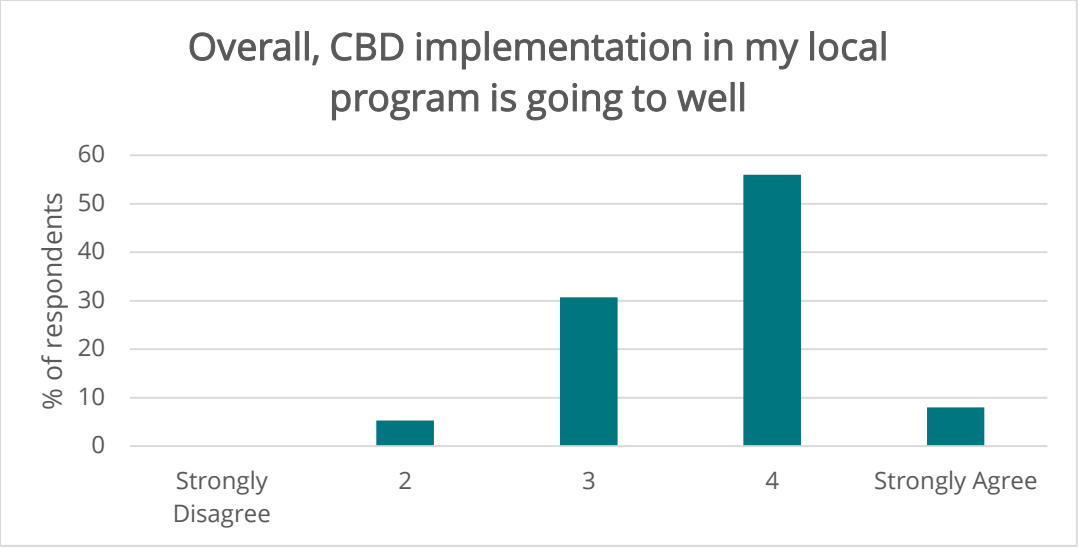

Figure 2. Agreement to statement "Overall, CBD implementation is going well in my local program

When asked how fully they had implemented CBD in interviews, most respondents indicated they had almost fully, or fully implemented CBD. When probed, many programs had implemented all elements of CBD, but did still have room for development in some areas.

When asked in interviews what changes they had made to their program in implementing CBD, the most commonly cited changes were forming a Competence Committee, creating a curriculum map, revising the curriculum to implement EPAs, and implementation of direct observation. This is in line with the highest scoring features on the survey.

Participants were asked the degree to which they had implemented key features of CBD on a five-point scale that ranged from non-implementation to full implementation. Average scores are provided in the graph below (Figure 1), in the order of degree of implementation.

There was a positive correlation between scores on overall implementation and mean score on implementation of CBD features ($r(75) = .573$, $p < .01$).

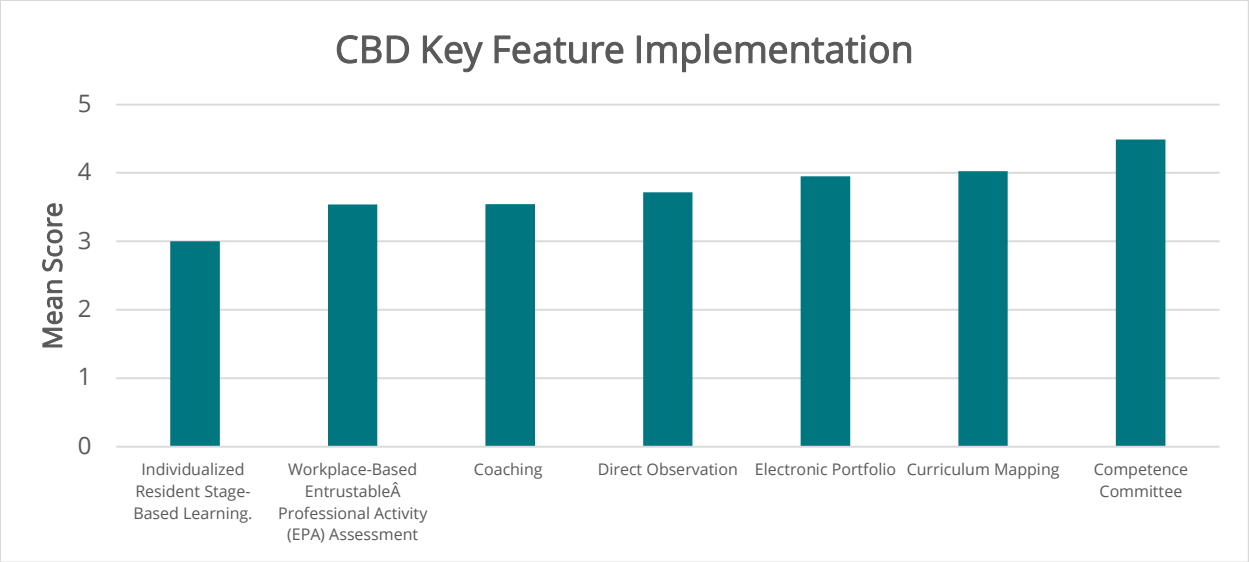

Figure 1. Average degree of implementation of key CBD features.

The key features of CBD and their level of implementation, based on innovation configuration mapping, is broken down in the graphs below. Scores range from non-implementation to fully implemented.

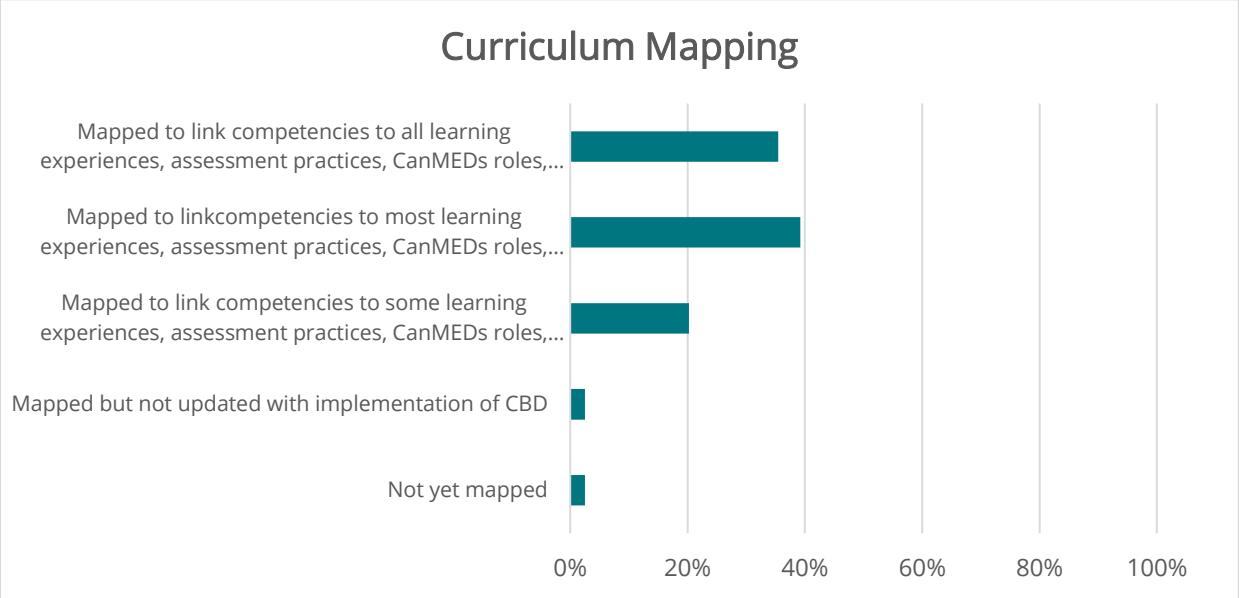

Figure 2. Curriculum Mapping responses.

The majority of programs had at least created a curriculum map to link competencies to **some** learning experiences, assessment practices, CanMEDs roles, and CBD stages, if not all. 6% of programs had not yet created a curriculum map or updated it with implementation of CBD. Programs are progressing towards full implementation of curriculum maps.

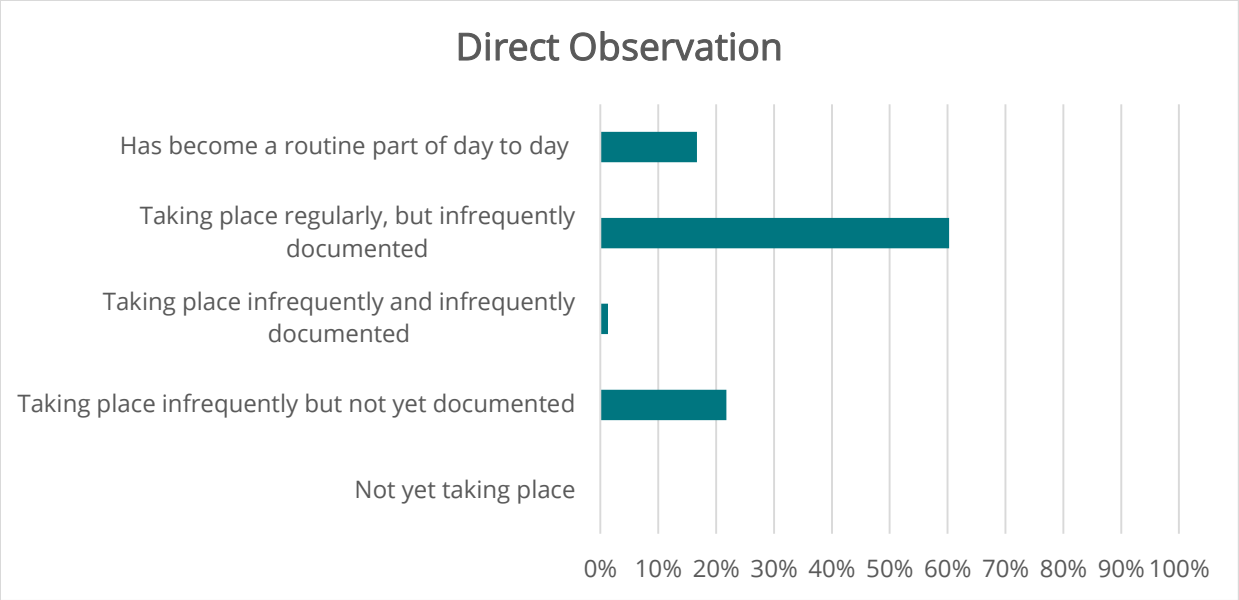

Figure 3. Direct observation responses.

The majority of programs had started, or are fully engaging in, direct observation of residents. However, many programs are infrequently documenting their direct observation; only 17% of programs had direct observation **and** documentation as part of their routine, day to day work. All programs are progressing towards full implementation of direct observation, and many programs noted that the increased or enhanced direct observation was a benefit of CBD implementation.

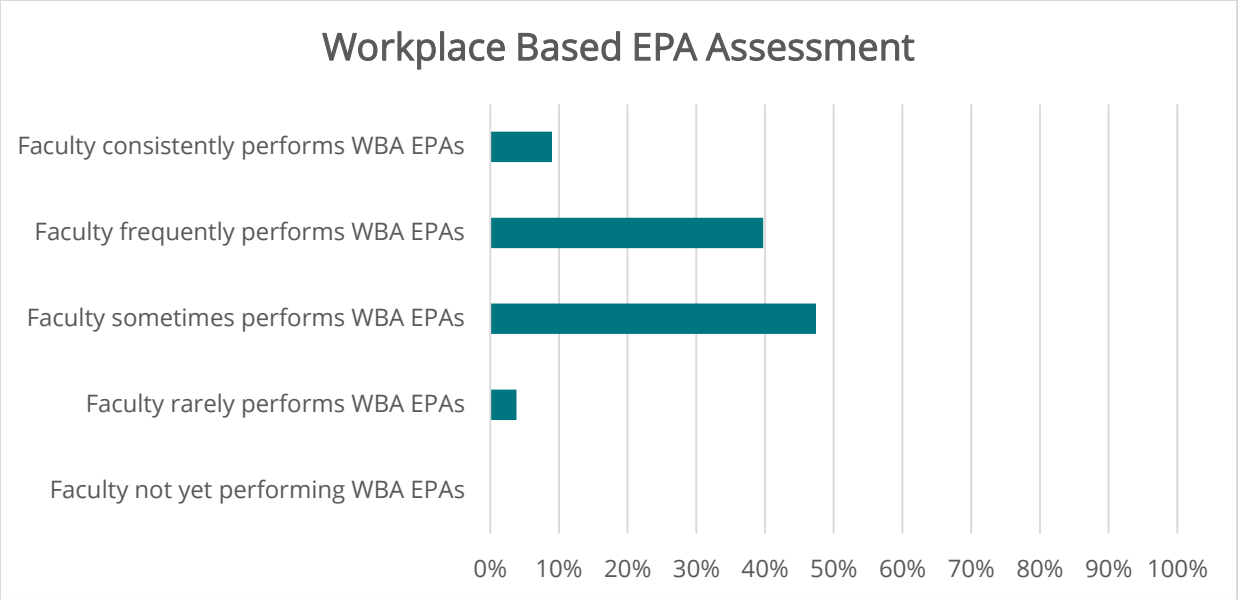

Figure 4. Workplace Based EPA Assessment responses.

Almost half of the faculty were sometimes or frequently performing workplace-based EPA assessment. Just under 10% of faculty were consistently performing workplace-based EPA assessment and a minority (4%) were rarely performing workplace-based EPA assessments. Programs are progressing towards full implementation of workplace-based EPA assessments; however, some programs may still need development in this area.

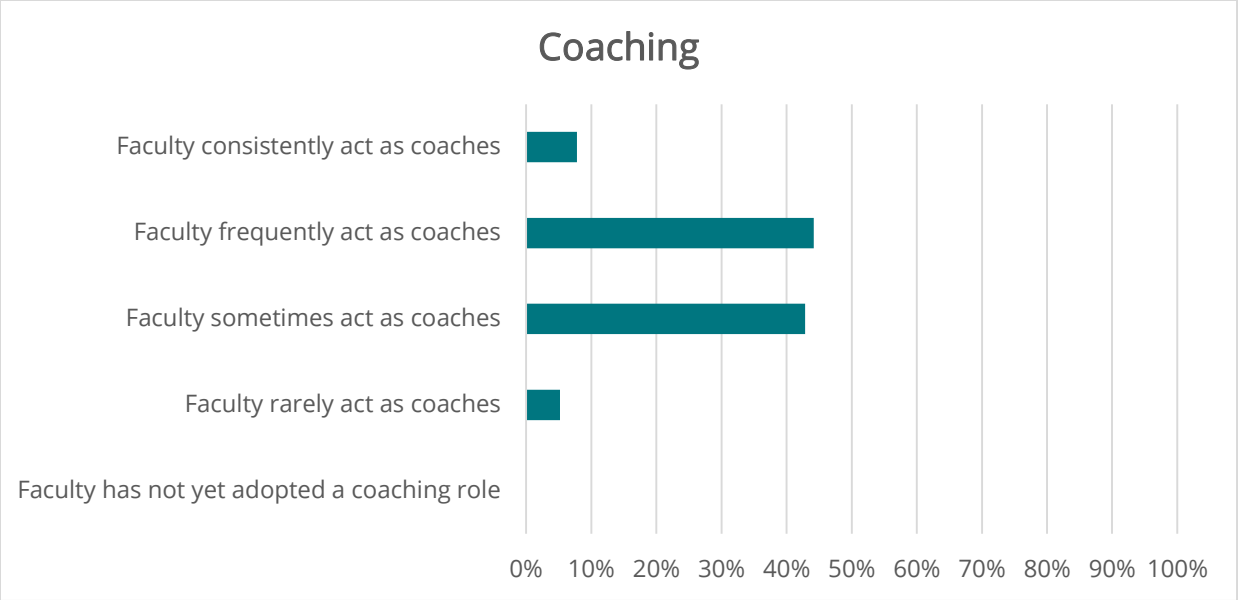

Figure 5. Coaching responses.

Programs were most likely to have faculty frequently or sometimes acting as coaches. Few programs had faculty consistently acting as coaches (8%) or rarely acting as coaches (5%). Programs are progressing towards full implementation, but few programs have fully implemented coaching at this time.

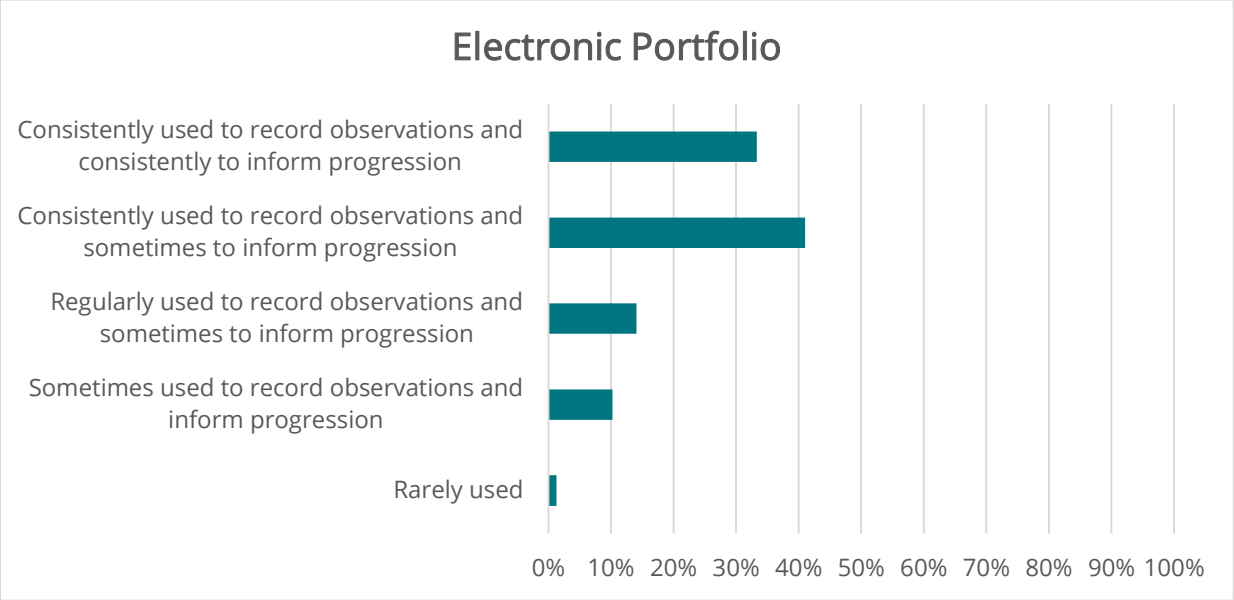

Figure 6. Electronic Platform responses.

The majority of programs are consistently using an electronic platform to record observations and are either consistently or sometimes using them to inform resident progression decision making. This suggests that the electronic platform is a key feature that many programs have fully implemented in CBD.

10% of programs who responded to the survey were sometimes using electronic portfolios, whereas only 1% of programs were rarely using electronic portfolios.

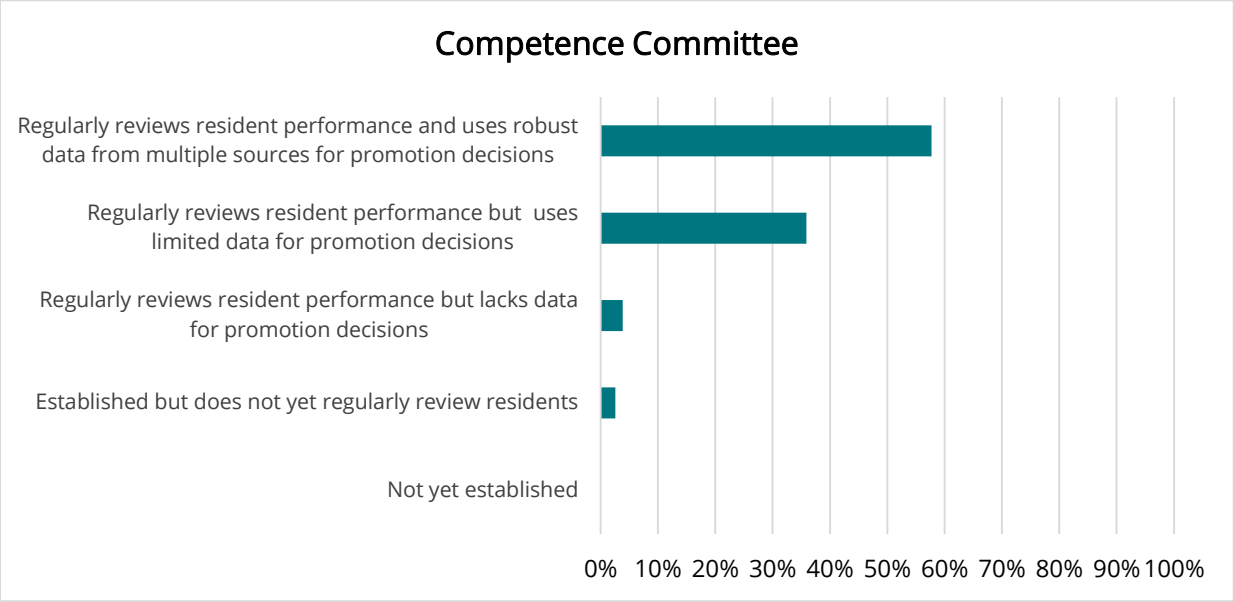

Figure 7. Competence Committee responses.

The majority of programs have a competence committee that regularly reviews resident performance and uses either limited (36%) or robust data (58%) to make promotion decisions. This suggests that Competence Committees are another key feature that many programs have fully implemented in CBD. This is consistent with the benefits cited for CBD; many programs cited that their Competence Committee was running smoothly and was providing a welcomed benefit to their program.

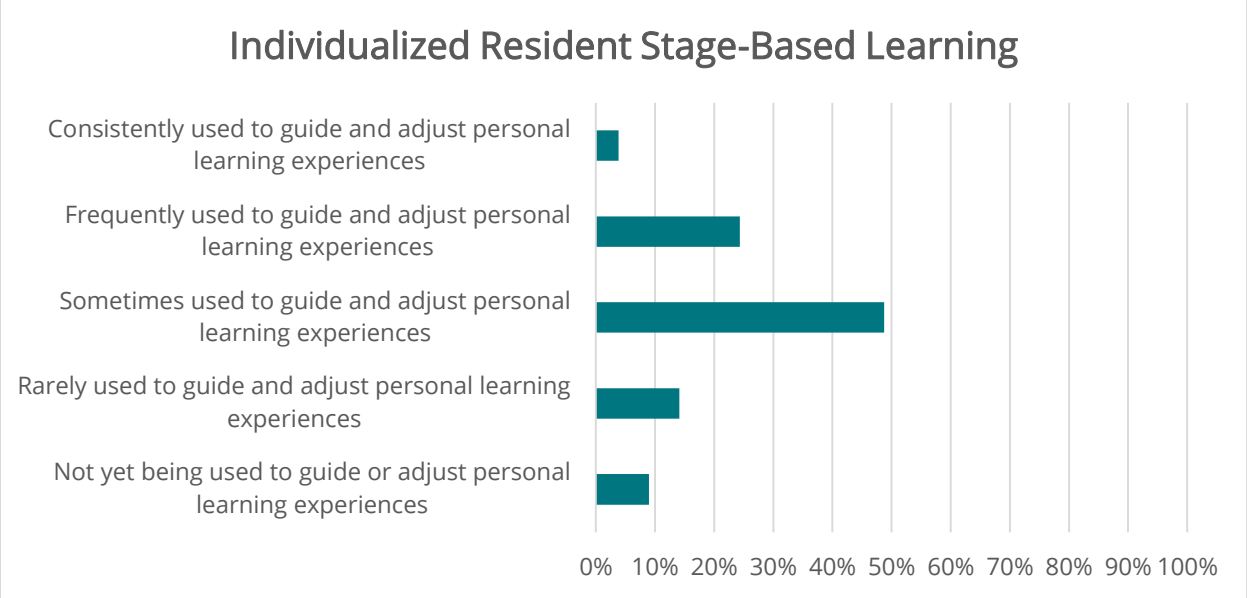

Figure 8. Individualized resident stage-based learning plans responses.

Scores on individualized resident stage-based learning plans were quite varied, with the majority of programs (73%) sometimes or frequently using learning plans to guide and adjust personal learning experiences. However, 23% of programs were rarely or not yet using personal learning plans. Only 4% were consistently using them. This suggests that more attention and clarification may be needed for this particular feature.

Tips and Tricks

Interview participants shared some tips on how they made their implementation go more smoothly.

- Start early! This makes the change manageable and not so overwhelming.
    - Prepare before, not during
    - Trial in advance if you can
- Make sure your program is running well in the first place and make CBD work with what you already have
- Understand that implementation is a process and accept that everything is not going to be perfect right out of the gate

Faculty Development and Resources

Faculty Development

Key takeaways

- Faculty development topics focused on "What is CBD" and the how-to for on the ground work. This information was primarily delivered by emails, workshops, presentations and grand rounds.
- Most respondents found their faculty development to be effective, and indicated that they would continue this development as CBD continues.
- Most respondents used resources from their local program and Faculty of Medicine, although many said Royal College information was helpful.

Participants were asked what faculty development methods they have used in the past 12 months. To deliver faculty development, more than half of respondents used email-based information and workshops. Interview participants also frequently mentioned using presentations, talks, grand rounds, workshops, and onsite visits. Other methods included hands on practice, having residents drive the teaching, emails, one-on-one meetings, and web conferences (Figure 9). Residents were typically oriented through their program orientation and academic half days.

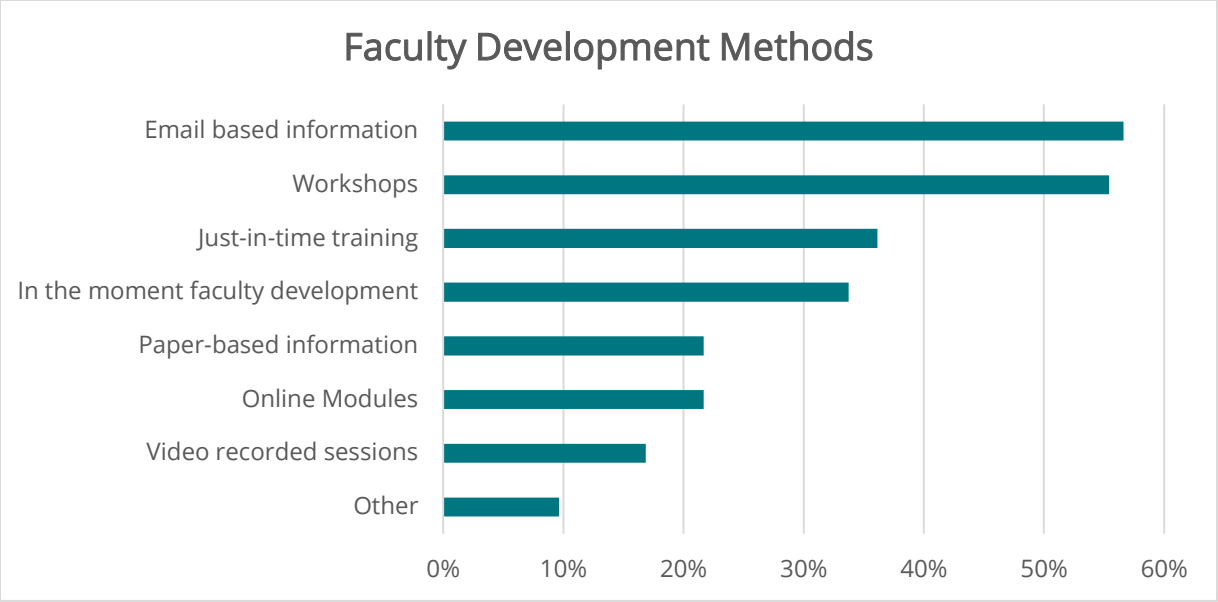

Figure 9. Usage of faculty development methods.

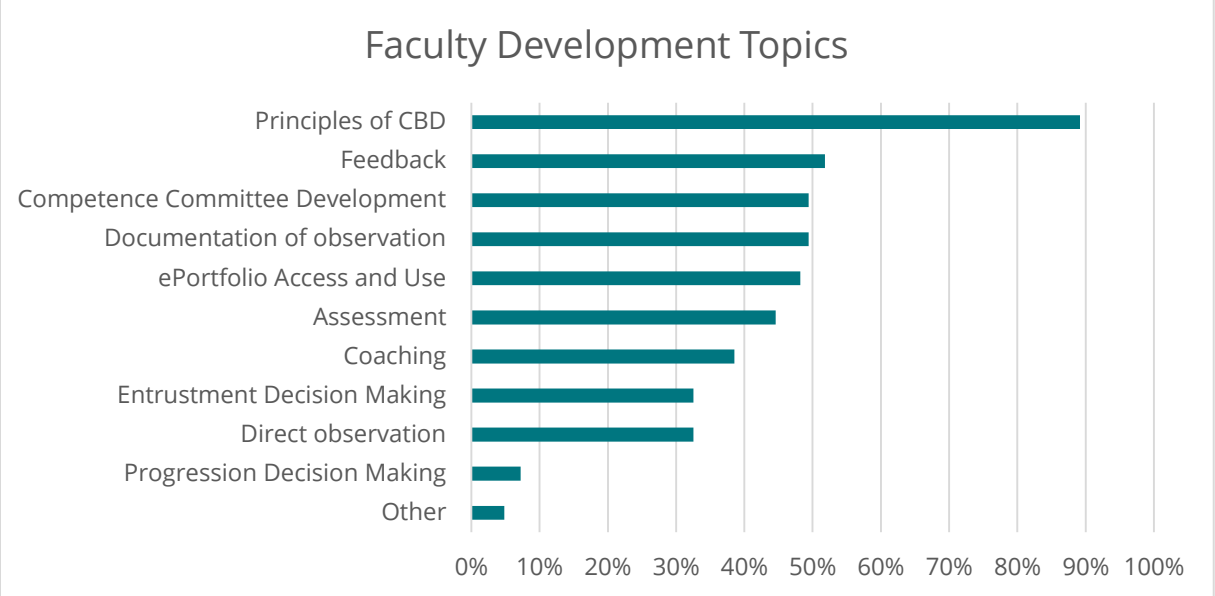

Figure 10. Usage of faculty development topics.

Topics that were covered, as noted by interview participants, included “what is CBD”, what is the theory and reasoning behind CBD”, and “how to” topics (such as, coaching, feedback, completing EPAs, electronic platform, requirements, using the scale, and culture change). These are in line with the results from the survey (Figure 10).

Most programs found their preparation effective, and said they would continue with it.

The most common resources for faculty development were from the local program and/or local institution. Most programs found their PGME offices were supportive, and some had faculty development resources or sessions.

When probed about Royal College resources, many program directors said they found Royal College resources to be helpful and often used the resources (i.e. ppt presentations, emails, implementation worksheets, etc.) to create their own faculty development. Program directors found it especially helpful hearing about experiences from other program directors (whether it was during specialty committee meetings or through emails shared by the Royal College). However, some program directors also noted challenges with some of the Royal College resources (i.e. support is too theoretical, resources are often geared toward those who are unfamiliar with CBD in general, lack of resources available to support those programs not using the Royal College ePorfolio.)

Many programs felt they had support in their CBD implementation, and for the most part, this support was fairly adequate. Support typically came from the program, the PGME office, and the department. Some programs did note supports that may have helped increase their readiness for CBD, such as more administrative support, additional time, and more training.

Tips and Tricks

- Many programs cited that having additional support, such as a program CBD lead or coordinator, CBD champion, or administrative support was helpful in implementation
- For more engaged faculty, meet with them often and allow them to ask questions
- Do stage specific boosters with residents to help them make the most of upcoming activities

Challenges and Benefits

Key takeaways

- The most common challenges participants faced were around time and resources (to prepare for CBD, to complete EPAs, and to collate data for competence committee review), challenges with culture change, and issues with the electronic platform.
- The most common benefits were better and more frequent feedback, a more objective review of the resident, catching struggling residents earlier, and better engagement of residents and faculty.

CHALLENGES

Participants were asked about challenges in both the survey and interview. While a variety of challenges were presented, there were some common challenges that many respondents raised.

Time and resources

For many program directors, the implementation of CBD has meant devoting a large amount of their time to orienting and training faculty and residents on different aspects of CBD, as well as in creating curriculum maps. Some program directors expressed that the majority of this work has fallen on their shoulders alone, whereas others have noted these responsibilities are sometimes shared with a CBD Lead.

The time required for program administrators to collate data for competence committee review has also been noted as an additional strain on resources. This is particularly true for programs that lack an electronic portfolio with capability to automatically generate this information.

It was also frequently noted that CBD puts additional onus on residents, particularly around the time required in having to teach faculty how to use the system and chase down EPA observations and feedback

Completion of EPA observations and feedback

Respondents expressed a number of challenges related to the obtainment of EPA observations and feedback.

Getting off-service faculty involved was frequently mentioned as a challenge, especially if the off-service staff are part of a discipline that has not yet launched CBD. This is often challenging for residents as well, who feel like they have to train these faculty on the EPAs and how the assessment forms work.

Furthermore, it was frequently expressed that residents are sometimes hesitant or apologetic when asking faculty for observations and feedback; they feel as if they are burdening the faculty with the requests.

Respondents found that some faculty are not initiating EPAs or completing feedback and observations in a timely manner. Respondents also found that the quality of narrative feedback could be improved.

Culture Change

Faculty

Many programs are experiencing some pushback and a lack of buy-in from faculty who have the mentality if “wasn’t broken, why fix it”. Many programs directors expressed that their faculty were simply engaging in CBD because it was mandated, not because they were convinced of the need to change. This may tie in to some faculty not completing observations when requested.

Residents

Residents have had a variable response to CBD; some programs believe their residents feel negatively towards CBD, some feel positively, and other programs have a mix. Some residents may see the value of CBD, but have difficulty getting feedback and observations from faculty, leading to feelings of stress and increased workload. Similar to faculty, many learners see CBD as something that is mandated, and respondents were unsure if their learners were embracing a growth mindset. During the interviews, program directors were probed to see if they have had experience with residents “gaming the system” or only asking for EPA observations when they feel confident they will achieve a high score, rather than asking for EPAs when the opportunity arises. Almost all of the program directors acknowledged that this was happening to some degree or another in their programs; for example, some residents only go to their “favourite

faculty" who they know will give good observations. However, some respondents did note that they were unsure if this was because those faculty were the ones who would fill out the form.

Electronic platform

A number of challenges were reported around the use of the electronic platform, regardless of system. Access to the portfolio was often noted as a challenge, whether it is staff at community hospitals who don't have access the platform, faculty who are not able to login because they haven't been registered in the system, or having poor mobile access. It was also frequently expressed that the ability to use the electronic portfolio for analytics was lacking, with difficulties in reporting and tracking of EPAs, compiling data, and extracting data for competence committee review. Many programs have had to manually create their own solutions which has been very time consuming.

BENEFITS

Participants were asked about benefits in both the survey and interview. Most of the benefits that respondents cited were around the key features of CBD implementation, such as the addition of a competence committee, enhanced direct observation and feedback, and the use of a curriculum map. Further benefits include residents taking ownership of their learning and more engagement in medical education from people across the system.

Competence Committee

The addition of a competence committee was noted as a key benefit for programs. Many respondents expressed that the implementation of a competence committee has taken pressure off the program director and offers the opportunity for a systematic and holistic review of the residents. Additionally, it was frequently noted, in both the survey and the interviews, that the competence committee review allows for the identification of struggling and accelerated residents earlier, thereby enabling more timely adjustments to their learning.

Direct observation and feedback

Many respondents noted that more frequent direct observation of the residents is now taking place, and the timeliness and quality of feedback is also slowly improving. Feedback is actionable, and observations are more frequent and consistent. Some respondents noted that the low stakes assessment may help residents feel less scrutinized.

Residents taking ownership of learning

According to the respondents of the survey, many residents are recognizing and seeking out opportunities to learn. They appreciate the clarity in the steps required for meeting their training requirements and are feeling empowered by their ability to take ownership of their learning.

Development of a curriculum map

As programs develop a curriculum map in line with CBD requirements, more thought is going into the specific goals of the training. It has also been useful in defining where training and learning experiences need to be achieved and has formalized the tracking of competencies.

Enhanced engagement in medical education

Another benefit of CBD has been the increased engagement of faculty and residents in medical education. Trainees and faculty are reflecting more on stages of training and specific educational tasks that make up the training program. Faculty members across multiple departments are now engaging more in discussions about medical education, whereas in the past it was predominately the program directors alone with limited input and support from colleagues.

Tips and Tricks

- Be thoughtful about curriculum mapping and use it to guide learning and to identify opportunities for residents.
- Map EPAs to more than one rotation where possible, make the curriculum flexible.
- Start mapping early!

RESIDENT WELLNESS

The impact of CBD on resident wellness is emerging as a common theme across multiple reports and domains, warranting further attention. In response to this emerging issue, the current study sought to look deeper into the concept of resident wellness in relation to CBD by asking program directors to indicate how their residents describe the impact of CBD on their health and wellness. While recognizing the limitation of asking program directors for their perceptions on residents' wellness, it was considered a proxy measure for the time being, and future studies will seek alternative methods for collecting and validating this important information.

As an initial step in studying resident wellness, program directors were asked to indicate how residents describe the impact of CBD on their health and wellness using a five-point scale. Results from this question are presented in figure 11. Almost 60% of respondents indicated that residents had not described any impacts of CBD on their health and wellness. Just under 30% of participants reported that *some* residents had describe CBD as having a negative impact on their health and wellness. 13% of respondents indicated that at least *some* residents describe CBD as having a positive impact on their health and wellness.

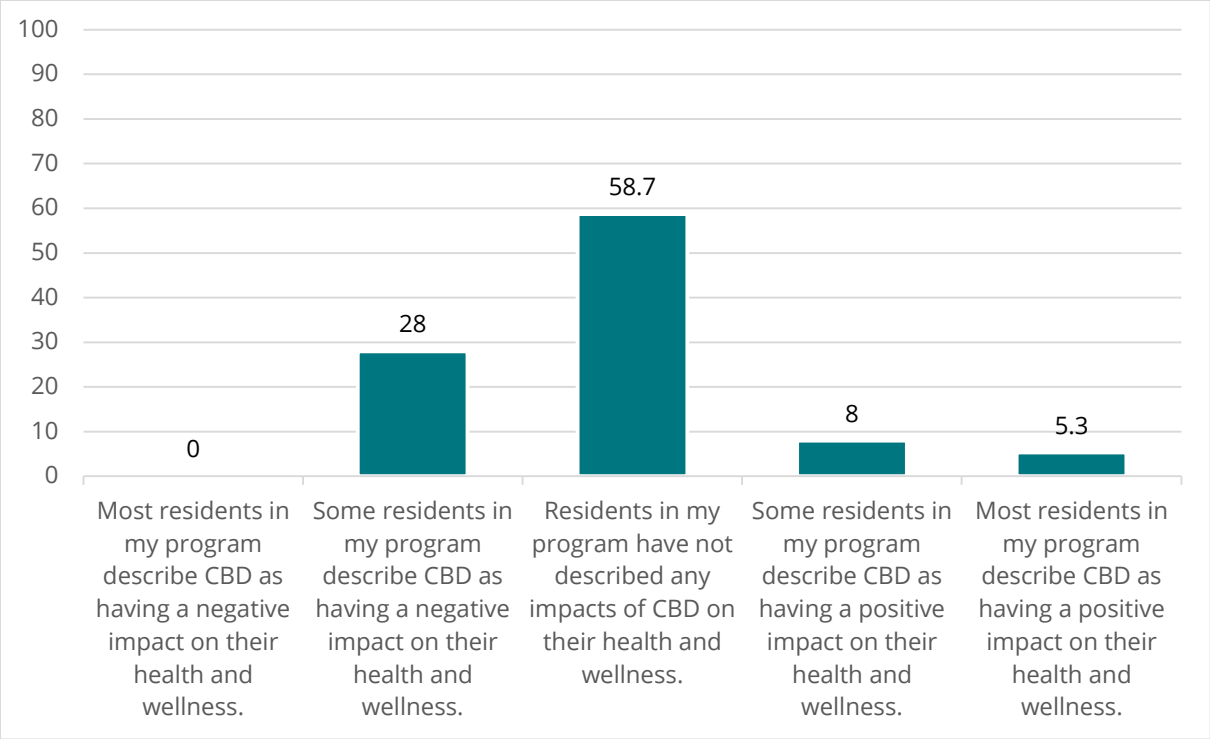

Figure 11. Impact of CBD on resident wellness

Program Directors were not specifically asked about residents' wellness during the interviews, but they were asked to comment on what the response to CBD has been like from learners. The responses were variable with some program directors indicating that the increased workload for residents in completing EPAs may be causing them additional stress and worry in an already busy and stressful environment. Others noted that residents have accepted the change, although may not have necessarily embraced it. Few program directors indicated a positive response from learners, although some specifically noted that residents are happy with the additional feedback.

Discussion and Recommendations

Key takeaways

- Most programs seem on track to achieve fidelity of implementation; whereas the integrity of implementation may still be lacking in many programs.
- Some early outcomes, both positive and negative, are seen through this study. These include better feedback and assessment, catching struggling residents earlier, better engagement, and potential negative impacts to wellness. Negative outcomes will need to be monitored going forward.

Fidelity and Integrity

When evaluating the implementation of an innovation, it is important to study both fidelity (the extent to which characteristics of the innovation have been implemented) and integrity (the extent to which the essential principles of an innovation have been adopted into practice). It is possible to have fidelity of implementation but not necessarily integrity of implementation.

In this report we focus primarily on fidelity of implementation. Accordingly, we found that in the programs responding to the survey, many of the key features of CBD are well underway to being implemented. For example, in the majority of programs, competence committees have been set up and are meeting regularly to discuss residents' progress, direct observation is taking place often, some coaching is taking place, a curriculum map has been revised to align with EPAs, faculty are performing workplace-based assessment, and most programs have started using an electronic portfolio to record observations. However, despite the implementation of these key characteristics, it was often expressed during the interview process that a belief in the underlying principles of CBD has not yet been fully embraced among many who are involved. This suggests that while the key features are being implemented, the realization of a shift in culture is something that is still in the process of being adopted by many programs.

Early Outcomes

This study did find some early outcomes of CBD, stemming from the benefits and challenges programs reported. Early outcomes point to some positive and negative outcomes. It will be important to monitor the negative outcomes, and implement changes where needed to ensure CBD is achieving what was intended and not having a detrimental effect.

Positive	Negative
• Identifying struggling and accelerating residents earlier • Enhanced engagement of faculty in medical education • Residents taking more ownership of their learning	• Some programs are experiencing strain on resources in terms of the time and effort devoted to preparing for and implementing CBD • Some trainees describe CBD as having a negative impact on wellness

Through the holistic review of the residents, competence committees are identifying at risk learners sooner and are also identifying accelerating residents. Another positive outcome that has emerged, is that throughout the preparation and implementation of CBD, faculty and residents who were not necessarily engaged in the underpinnings of medical education before are now showing more interest and involvement. Some programs have also suggested that residents are now taking more ownership of their learning; they are recognizing opportunities to learn and are feeling more empowered by their achievements.

Some negative, unintended outcomes are also emerging. Specifically, the additional workload and stress being experienced by program directors was not anticipated and will be monitored going forward. Similarly, the stress being encountered by residents from trying to chase down EPAs was not an intended effect of the implementation of CBD, and this impact on wellness will also be carefully monitored and addressed.

Advice and Recommendations

Based on the data presented above, as well as advice respondents gave to the Royal College, some preliminary recommendations have been created. These recommendations will be shared and discussed with internal teams at the Royal College.

RECOMMENDATIONS

Monitor outcomes

The monitoring of outcomes should continue as CBD implementation occurs, and outcomes should be explicitly studied. This will ensure CBD is being implemented as intended, and is not having any unintended, detrimental effects. Any unintended, negative outcomes, such as the ones found in this study, should be closely monitored and adaptations made to counteract the negative effects when necessary.

Identify opportunities for enhanced collaboration

As disciplines continue to implement Competence by Design, it will be useful to learn from other programs and disciplines. Identifying opportunities for collaboration and sharing best practices will be important, both within and across disciplines.

Promote the completion of EPAs

Determining how best to support and encourage both faculty and residents to complete EPAs should be considered. This may include directing faculty to developmental resources (such as coaching and feedback modules) or providing residents with the support they need to increase their confidence in approaching faculty with requests for observations and feedback.

Provide support around electronic platforms

Regardless of the platform being used, programs are experiencing challenges with electronic platforms. Efforts should be made to ensure adequate support is available to faculty and programs, whether it is ensuring everyone has access to the system (including off-service faculty), making sure the proper technological support is in place, or offering education or improvements extracting and presenting data for reviewing resident progression. Collaboration and discussion between programs using similar platforms may be a way of learning from each other's challenges and solutions.

Support updates and improvements to EPAs and milestones

As programs implement CBD, it will be important to facilitate and support Specialty Committees in making iterative changes and improvements to EPAs and milestones when needed. It will also be important to keep track of challenges previously encountered and use them to guide new disciplines in their EPA and milestone development.

Monitor time required, resources, and impact on wellness

The additional time and effort which some program directors, faculty, residents, and program administrators are experiencing to prepare, support, and engage in CBD implementation may have an impact on wellness. It will be important to monitor the time and resources required at any given time going into CBD to ensure that no one is experiencing burnout or excessive stress and to offer resources and support when needed. The impact on resident wellness was studied in this report, and will continue to be monitored going forward to determine if any negative impacts on health and wellness are longitudinal in nature, or specific to the time around CBD launch. Future studies should

also consider exploring the impact on wellness for program directors, faculty, and program assistants in addition to residents.

Acknowledge that change is a process

Competence by Design has not been fully embraced by everyone involved in its implementation. There are many who are involved only because it has been mandated at the national level and are not necessarily convinced by the need for change. To encourage a shift in culture, it will be important to continue to share the rationale for CBD and to promote the adoption of a growth mindset.

Reflect on utility of the findings

It will be important to continuously monitor the utility of the findings that are coming out of this report and other studies looking at the implementation of CBD. This will mean engaging with those who receive the report to determine the usefulness of the information received and to better understand how it may be used to make improvements to their own programs. This will help inform future iterations of the survey and the questions asked during interviews to better support programs moving forward.

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Appendix A

CBME Core Component	CBD-RE Program Model – Main Features
COMPETENCY FRAMEWORK **Competencies required for practice are clearly articulated**	• Competencies and outcomes are aligned with societal needs and are **socially accountable** • **CanMEDS 2015** and discipline-specific competencies form the framework for aligning specialty training with competencies required for practice
SEQUENCED PROGRESSION **Competencies and their developmental markers are sequenced progressively**	• Discipline specific **Entrustable Professional Activities (EPAs)** and associated milestones provide discrete markers of competence • Discipline specific EPAs are organized into the **CBD Competence Continuum** to reflect how distinct, yet integrated stages of training are employed to support increasing progression towards readiness for practice
TAILORED EXPERIENCES **Learning experiences facilitate the developmental acquisition of competencies**	• **Learning experiences are based in authentic, work-based environments** that match the settings of future practice • **Learning experiences are organized** to acquire competencies and demonstrate EPAs • **A hybrid model** is used to organize learning experiences where time is still used as an organizing framework but there is flexibility in learner progression and acquisition of competencies • **Learners are motivated** to use competencies to guide and enhance their learning experience
COMPETENCY-FOCUSED INSTRUCTION **Teaching practices facilitate the developmental acquisition of competencies**	• Learning is guided by **real-time, high quality feedback** from multiple observations • **EPAs are used to structure learning and focus instruction** • **Teachers act as coaches** for the purpose of improvement, with repeated focused observation and feedback
PROGRAMMATIC ASSESSMENT **Assessment practices support and document facilitate the developmental acquisition of competencies**	• **Assessment is used for learning** through competency-based assessment focused on observations of EPAs in the workplace • **Assessment is used for progression** by linking promotion decisions and certification with successful completion of EPAs and progression through stages of training • A **Competence Committee is responsible for regular review** of learner progress using highly integrative data from multiple EPA and milestone observations and feedback in clinical practice • Changes to the **certification examination** to ensure entry to the Royal College examinations is **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 is used to demonstrate and record** developments in competence and independence

Appendix B

Competence by Design (CBD) Pulse Check

Part 1 - Demographics

Please select your specialty/subspecialty:

- Anatomical Pathology
- Cardiac Surgery
- Critical Care Medicine (Adult)
- Critical Care Medicine (Pediatric)
- Gastroenterology (Adult)
- Gastroenterology (Pediatric)
- General Internal Medicine
- General Pathology
- Geriatric Medicine
- Internal Medicine
- Neurosurgery
- Obstetrics and Gynecology
- Radiation Oncology
- Rheumatology (Adult)
- Rheumatology (Pediatric)

Please select your institution

- University of British Columbia
- University of Alberta
- University of Calgary
- University of Manitoba
- University of Saskatchewan
- Western University
- McMaster University
- University of Toronto
- Queen's University
- University of Ottawa
- Northern Ontario School of Medicine
- McGill University
- Université de Sherbrooke
- Université de Montréal
- Université Laval
- Dalhousie University

- Memorial University of Newfoundland

How long has it been since your program **locally** launched CBD?

- <6 months
- 6 months to 1 year
- 1 to 2 years
- 2 to 3 years
- 3 to 4 years

Your role (Please note that only a single respondent for each program is asked to complete this survey)

- Program Director
- Associate Program Director
- Program CBD Lead
- Other (please specify):

Part 2 – CBD Implementation

Using the scale below, please indicate the position that best reflects your agreement with the following statement:

Overall, CBD implementation in my local program is going well.

Strongly disagree				Strongly agree

Part 3 – CBD Features of Implementation

Please choose your response based on the degree to which this activity is currently taking place in your program.

Curriculum Mapping – A curriculum map is a tool that indicates how the components of a curriculum are related to one another. In the case of CBD, it links competencies to learning experiences, assessment tools, and CanMEDS roles throughout the stages of training (Ladhani & Writer, 2014).

Curriculum mapping				
1	2	3	4	5
The curriculum has **not yet** been mapped.	The curriculum has been mapped, but not updated with the implementation of CBD.	The curriculum has been mapped to link competencies to **some** learning experiences, assessment practices, CanMEDs Roles, or CBD stages.	The curriculum has been mapped to link competencies to **most** learning experiences, assessment practices, CanMEDs roles, or CBD stages.	The curriculum has been mapped to link competencies to **all** learning experiences, assessment practices, CanMEDs roles, and CBD stages.

Direct Observation – Direct observation takes place when supervisors purposefully observe residents while they perform patient care or clinical activities that are meaningful, realistic and authentic (Kogan, Hatala, Hauer & Holmboe, 2017).

Direct observation				
1	2	3	4	5
Direct observation of learners is **not yet** taking place.	Direct observation of learners is taking place **infrequently**, but is **not yet** documented.	Direct observation of learners is taking place **infrequently** and is **infrequently** documented.	Direct observation of learners is taking place **regularly**; however, it is **infrequently documented**.	Direct observation and documentation of learner performance has become a **routine part** of day to day work.

Workplace-Based Entrustable Professional Activity (EPA) Assessment – Workplace-based assessment involves the documentation of an assessment of competence and the feedback generated by supervisors from authentic clinical observations for the purpose of trainee development and EPA achievement decisions. EPAs reflect the authentic work of physicians and provide explicit teaching, learning and assessment goals for residents (Gofton, Dudek, Barton & Bhanji, 2017).

Workplace-Based EPA Assessment				
1	2	3	4	5
Frontline supervisors have **not yet** started to perform workplace-based EPA assessment.	Front line supervisors **rarely** perform workplace-based EPA assessment.	Front line supervisors **sometimes** perform workplace-based EPA assessment.	Front line supervisors **frequently** perform workplace-based EPA assessment.	Front line supervisors **consistently** perform workplace-based EPA assessment as a part of day to day work.

Coaching – In CBD, supervisors are encouraged to act as coaches. In this role, clinicians should provide residents with actionable feedback based on observation that is meant to guide them through a growth process resulting in performance enhancement. Coaching can occur in the moment as part of daily work, and over time (Royal College of Physicians and Surgeons of Canada, 2018).

Coaching				
1	2	3	4	5
Front line supervisors have **not yet** adopted a coaching role with learners.	Front line supervisors **rarely** act as coaches.	Front line supervisors **sometimes** act as coaches.	Front line supervisors **frequently** act as coaches.	Front line supervisors **consistently** act as coaches.

Electronic Portfolio – An electronic portfolio is a learning tool in CBD that allows for the electronic capture of observations, archiving of resident learning data, production of analytics and reports, and assessment of resident progression by competence committees (RCPSC, 2019b).

Electronic portfolio				
1	2	3	4	5
An electronic portfolio is **not yet** being used to record resident observations.	An electronic portfolio is **sometimes** used to record resident observations and **sometimes** to inform resident progression decision making.	An electronic portfolio is **regularly** used to record resident observations and **sometimes** to inform resident progression decision making.	An electronic portfolio is **consistently** used to record resident observations, and **sometimes** to inform resident progression decision making.	An electronic portfolio is **consistently** used to record resident observations and to **consistently** inform resident progression decision making.

What electronic platform do you use? Please provide any comments you may have on it.

Competence Committee - A competence committee makes formal resident promotion recommendations using data from multiple EPA and milestone observations, documented feedback from clinical practice and assessment sources such as examinations. A competence committee allows for an informed group decision-making process where patterns of performance can be collated to reveal a broad picture of a resident's progression toward competence (RCPSC, 2019a).

Competence committee				
1	2	3	4	5
A competence committee has **not yet** been established.	A competence committee has been established but does **not yet regularly review** resident performance.	A competence committee **regularly** reviews resident performance but **lacks data** to make promotion decisions.	The competence committee **regularly** reviews resident performance, but uses **limited data** for promotion decisions.	The competence committee **regularly** reviews resident performance, and uses **robust data collated from multiple sources** for promotion decisions.

Individualized Resident Stage-based Learning – A developmental approach that recognizes that **all** residents can benefit from a documented individualized learning plan and stage-specific supports. These may include special mentors, readings or modified rotations to maximize growth and learning (RCPSC, 2019a)

Individualized resident stage-based learning plans				
1	2	3	4	5
Individual resident learning plans are **not yet** being used to guide or adjust personal learning experiences.	Individual resident learning plans are **rarely** used to guide and adjust personal learning experiences.	Individual resident learning plans are **sometimes** used to guide and adjust personal learning experiences.	Individual resident learning plans are **frequently** used to guide and adjust personal learning experiences.	Individual resident learning plans are **consistently** used to guide and adjust personal learning experiences.

Part 4: CBD Faculty Development

1. In the **last 12 months**, what faculty development topics have your **front line faculty** received? (check all that apply)
    a. Principles of CBD
    b. Direct observation
    c. Documentation of observation
    d. Assessment
    e. Coaching
    f. Feedback
    g. Entrustment decision making
    h. Competence committee development
    i. Progression decision making
    j. ePortfolio access and use
    k. Other (please specify)

2. In **the last 12 months**, what **methods** have been used to deliver this faculty development? (check all that apply)
    a. Workshops
    b. Online modules
    c. Video recorded sessions

d. Just-in-time training (workplace-based)
e. Grand rounds
f. Email based information
g. Paper-based information
h. In the moment faculty development
i. Other (please specify)

3. In **the last 12 months**, of the following sources of faculty development resources, please rank the **sources** in terms of **most frequently used**.
    a. Royal college
    b. Local faculty of medicine
    c. Your own local program/department
    d. Other

Part 5: Benefits and challenges

Question 5a - Briefly describe the **challenges** you have encountered to date with CBD implementation:

Question 5b – Briefly describe what you have done to **overcome the challenges** you have encountered?

Question 6 - Briefly describe the **benefits** you have encountered with CBD implementation so far in your program:

Question 7 Resident Wellness – Residency training can be a particularly challenging time during a physician's career and has the potential to affect resident wellness. Resident wellness relates to the complex nature of resident physical, mental, and emotional health and well-being. (Wallace, Lemaire, & Ghali, 2009).

Resident Wellness				
1	2	3	4	5
Most residents in my program describe CBD as having a **negative** impact on their health and wellness.	**Some** residents in my program describe CBD as having a **negative** impact on their health and wellness.	Residents in my program have **not** described **any** impacts of CBD on their health and wellness.	**Some** residents in my program describe CBD as having a **positive** impact on their health and wellness.	**Most** residents in my program describe CBD as having a **positive** impact on their health and wellness.

Question 8 - What, if anything, could the Royal College do better to support you?

Question 9 – Please share any other comments you might have:

Thank you for taking the time to fill out your survey! Pending your availability, we may follow-up with you via a brief telephone interview to delve more deeply into your experiences with CBD implementation thus far.

Appendix C

Pulse Check Interview Guide

Introduction

This interview is a follow-up to the Pulse Survey recently conducted. The Royal College is interested in further understanding your experience with implementing CBD to date, what is working well, any challenges that you are encountering and any suggestions you have for improvement. In analyzing the data we will be focusing on the identifying themes; it will not be possible to identify individual program responses. This interview should take no longer than 30-45 minutes. Do you have any questions before we begin?

Have you (or your predecessors) had experience with making a big change in your residency program in the past?

- **What were some barriers to this change?**
- **What helped you succeed?**

Questions:

We are interested in details of your implementation. More specifically,

1. In implementing CBD, what program changes have you made to date?
    - Is there anything you did during implementation that you think helped implementation go more smoothly? Could be an adaptation, etc.

2. In your opinion, how fully has your program implemented CBD?
    - How do you personally measure implementation?
    - What does fully implemented mean?
    - What is your expectation for full implementation?

3. Did you do anything specific to prepare your teachers and learners for the implementation of CBD? If yes, what did you do and who was involved?
    - Was this preparation effective? Why or why not?

Now we would like to turn to understanding your experience to date.

4. What is working well?

5. What challenges have you encountered?
    - Have you experienced residents "gaming the system"?

6. Have you experienced any surprises or unanticipated consequences as a result of CBD implementation? (i.e., Things you didn't expect to see but are experiencing either positive or negative in nature)

7. What has the response been from your:
- Teachers?
- Learners?

8. Do you think your teachers and learners have been adequately informed and convinced of the need to change?
- Why or why not?

9. What resources and/or supports did you have in place to help with implementation?
- Were these adequate?
- If not, what resources or supports would have helped increase your readiness? (Probe for RC supports, PG office or program supports)
    - Do you find the Royal College supports helpful?

Finally, we would like your advice on moving forward.

10. Is there anything that the RC should be doing to assist specifically with your specialty program implementation moving forward?

11. Based on your experience to date what would you recommend to another Program Director to prepare for implementation?
- Do you have any tips or tricks to offer?

12. What advice would you give to the Royal College for future cohort preparation?

Is there anything else that we have not covered that is important to know at this point?

Appendix D

CBD Program Evaluation Operations Team

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