Adult cardiology residency programs across the country made the formal transition to competency by design (CBD) in July 2021. This transition has led to an increase in formal assessments for residents and new roles and responsibilities for faculty and administrative staff. CBD has brought successes including more organized learning, flexibility in rotations, along with increased direct observation and feedback. The associated administrative burden is cumbersome and has contributed to increased stress, anxiety, and a negative impact on health and wellness for residents. Despite several positive changes to date, ongoing efforts are needed to better navigate this curriculum change.

Competency by design (CBD) is a recently launched initiative by the Royal College of Physicians and Surgeons of Canada to training programs across the country. The overarching goal of CBD is to ensure that physicians graduate with a comprehensive set of competencies deemed necessary to meet evolving health needs.

There are 36 entrustable professional activities (EPAs) in the Adult Cardiology Residency Training Program, each with their own unique set of learning objectives written in the form of milestones, based upon the Canadian Medical Education Directions for Specialists (CanMEDS) framework. Residents are expected to complete EPAs with either direct or indirect observation by a supervisor who can be an attending staff member, fellow, senior resident, or allied health professional. This observation should be followed by “in-the-moment” and “in-person” feedback structured to guide learning.

Canadian adult cardiology residency programs made the formal transition to CBD in July 2021, with some programs launching earlier, including Dalhousie University in July 2020. As a resident who completed training in a program that was an early adopter of CBD (W.F.), there have been several challenges and successes, with positive changes that have been incorporated into the curriculum (Table 1). These key points will be outlined in the following section—from a trainee perspective—with the aim of helping residents, staff, and program leads across the country navigate the recent transition to CBD.

**Successes**

EPAs have promoted organized learning, as they create an outline of skills to be achieved based on progression through residency, which allows discrete and shorter-term goals to be set based on individual rotation and year of training. This relieves pressure for higher-level skills that require more practice to obtain. CBD facilitates resident control over learning as it exposes areas for improvement, which is helpful to guide elective choices.

In our own program, CBD has permitted increased flexibility with rotations to benefit individual learning goals. Specifically, “hybrid” elective rotations during the final year of training allow learners to rotate on different services in 1- to 2-week segments during the block to fulfill EPA requirements, given that the classic in-training evaluation report (ITER) is no longer the sole form of assessment. This strategy alleviates pressure associated with meeting EPA requirements because it offers flexibility to gain additional exposure without having to repeat entire rotations and is helpful if a resident only needs a few more days to finish EPA assessments.

The launch of CBD has also allowed the identification of topics that could be better integrated into training programs. For example, a transcutaneous pacing simulation was created, as this is uncommonly encountered clinically and previously not formally taught. On “stress and nuclear” rotations, there is now dedicated time for Holter and electrocardiogram (ECG) reading, which is a valued exposure for the Royal College examination and future practice.

Finally, there has been a significant increase in feedback compared with the traditional use of ITERs. In particular, “direct observation” by supervisors now occurs more formally.
and frequently and is beneficial for learning, as it promotes specific and task-oriented feedback.

**Challenges**

CBD has led to an overall increase in number of formal assessments. There are 36 EPAs in adult cardiology, with multiple required observations of achievement for each, resulting in 157 successful observations for each resident to achieve over 3 years of training. From a resident perspective, the time spent coordinating the particulars of obtaining different EPAs and following up on their completion with staff can become logistically challenging and cumbersome in an already-demanding residency. A commonly cited challenge by residents nationwide has been the increase in stress and anxiety associated with the substantial administrative burden, difficulty asking staff to complete EPAs, and concern with meeting the large number of assessment requirements. In 2021, a CBD Resident Pulse Check Report showed that this transition has had a significant negative impact on resident health and wellness, with 38% of residents reporting a large and 35% reporting a small negative impact. In addition, the vast increase in number of assessments brings new roles and responsibilities for supervisors and administrative staff, often without adequate training or resources.

Although the EPAs have contributed to a general increase in the amount of feedback, another cited challenge pertains to variable timelines for receiving feedback. Specific and actionable feedback is most useful if delivered in a timely manner. This concept is especially important in CBD because most EPAs are rotation specific, meaning feedback delivered electronically weeks later may be less meaningful if residents have moved on to different rotations, as they will not have the opportunity to reattempt the EPA. To encourage timely feedback in our program, there is a 14-day expiration date on EPAs, and staff members are encouraged to complete EPAs within 48 hours. Recognizing that it may be difficult for supervisors to meet this target when there is a delay in the EPA being sent, residents are similarly given a 48-hour timeline for which they can trigger their EPAs.

**Future Steps**

With the first cohort of residents completing cardiology training in a CBD model, we were able to identify some simple strategies to improve the implementation of CBD moving forward:

**Implementation of scheduled EPA opportunities into curriculums**

This year, our program is launching an “EPA opportunity” for stress-test interpretation in which residents are given a batch of preselected stress tests to read during a 1-hour scheduled session. Residents can e-mail answers to a dedicated assigned staff, and answers will be reviewed at the end of the session. This EPA opportunity will decrease the time and effort spent by residents coordinating the logistics of obtaining EPAs. It will also offload the burden from residents in a low-stakes, informal environment, while also providing a more diverse case mix than might otherwise be observed during a week on stress. If successful, there is potential for these sessions to be scheduled more regularly throughout the year for difficult-to-achieve EPAs including device interrogations, coronary angiograms (including post bypass surgery) and right heart catheterizations, and ambulatory ECG monitors.

**Assignment of dedicated faculty and administrative CBD leads at a program level**

EPA assessments create a requirement for direct observation and coaching from supervisors as well as data aggregation and analysis from program leads and Competence Committee members, which requires time and a more diverse skill set. It has been proposed that key implementation of CBD requires ongoing faculty development but also the development of several faculty-specific and administrative roles to better support learners through the increasing complexity of CBD.

For example, the use of an information technology lead to set up frequent automated reminders on electronic platforms, or a competency-based medical education (CBME) data support administrator to keep track of pending and completed EPAs, would offload these burdens from residents. With respect to faculty roles, a CBME program lead would be useful to mentor residents through CBD, assist them in tracking down faculty to complete pending EPAs, and provide longitudinal faculty-development sessions.
Encouragement of staff participation in CBD with ongoing faculty feedback and development

The idea of implementing incentives, penalties, or mandatory quotas for EPAs to encourage staff participation in CBD has been proposed. In our program, performance reviews were instead implemented as a mechanism of feedback for staff participation in CBD. Annual personalized e-mails were distributed to staff with individual EPA statistics, including number of EPAs completed, percentage expired, and average time to completion, along with group averages for comparison. Department-wide rounds were held on CBD, in which data were presented along with EPA completion targets. These performance reviews, paired with annual faculty development sessions, proved to be a valuable intervention that could be continued in the future to increase awareness and participation in CBD.

Elimination of redundant assessments

Each EPA integrates several milestones that encompass all roles in the CanMEDS framework. The Royal College recommends that programs use multiple types of assessment tools that provide both qualitative and quantitative data, and EPA observations should not be the sole source of data. In our program, ITERS are still being used in conjunction with EPAs, as they provide global feedback in addition to specific task-oriented feedback on EPAs. In most settings, this is valuable, as ITERS can highlight important points that may not be captured in EPAs. However, an element of overlap and redundancy exists between some EPAs and ITERS, which increases the burden of assessments for staff, with minimal added feedback for the learner.

In particular, there are ample EPA assessments in cardiac diagnostics relating to exercise/nuclear stress tests, resting/ambulatory ECGs, device interrogations, and transthoracic echocardiograms. A more streamlined approach moving forward may be useful to relieve this assessment burden and eliminate redundancy, as some of these EPAs may actually provide a more comprehensive and multifaceted assessment than the classic ITER.

Promotion of flexibility with CBD implementation at a program level

In May 2023, the essential requirements of CBD Implementation statement was released to provide programs and competence committees with more agency and flexibility over the implementation of CBD. Recognizing the feedback on CBD and unintended negative effects for programs and learners, this statement provides programs with flexibility to modify EPAs and make adjustments to alleviate the assessment burden while still meeting accreditation standards. Given the immense challenges and barriers associated with CBD, continual changes should be made in all programs, ideally with resident feedback.

Conclusions

Adult cardiology programs across the country made the formal transition to CBD in July 2021, with some programs launching earlier, including Dalhousie University. Despite the challenges, CBD has brought successes, including more organized learning, increased opportunities for feedback, and resident control of learning. The program at Dalhousie has been proactive in developing useful strategies to facilitate this transition, with the identification of further key steps to implement moving forward. Ongoing resident and faculty development are important, as CBD is still a relatively recent change.

Ethics Statement

This research report has adhered to the relevant ethical guidelines.

Patient Consent

The authors confirm that patient consent is not applicable to this article. This is a training/research article and does not include any patient-related data.

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References


