Perceptions of Canadian radiology residents regarding competence by design: A Western Canadian survey

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Abstract

Purpose: This study sought to evaluate the perceptions of Canadian Radiology residents on Competence by Design (CBD) and to identify areas in which further information and guidance is required.

Methods: Radiology residents at five Western Canadian Radiology programs were eligible to participate in this online survey. The survey contained an assortment of question formats, including 5-point Likert-scale responses, multiple-choice questions, and free text response. The questions assessed understanding of resident perspectives on feedback and coaching, learning and gaps in knowledge, and quality of training and preparedness within the CBD model.

Results: Twenty-one residents from each of the five radiology residency programs and across each year of training participated in the survey. The majority of residents reported they disagreed (43%) or strongly disagreed (19%) that the CBD model will be more beneficial compared to the traditional training model. 90% reported their overall perspective of CBD as indifferent or negative. Entrustable professional activities (EPAs), milestones and promotions decisions and committee review were the top 3 areas residents require further information on. Residents identified timely and direct feedback as a positive aspect of CBD but expressed concern over time management within the new curriculum.

Conclusion: This study identified specific areas of concern that may attribute to the overall negative or indifferent perception towards CBD by residents. Addressing resident concerns and gaps in knowledge during the early stages of CBD implementation may encourage long term engagement and provide an opportunity to address the overall negative or indifferent perception of CBD.

Keywords: Medical education, competence by design, radiology, residency, post-graduate medical education

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Introduction

Competency based medical education (CBME) is now the new training model for many residency programs across Canada. The Royal College of Physicians and Surgeons of Canada (Royal College) has adopted its own version of CBME called Competence by Design (CBD).[1] The CBD curriculum was implemented in Canadian Diagnostic Radiology (Radiology) residency programs using a staggered approach, with different cohorts transitioning at different times. All Canadian radiology training programs completed the transition to this new instructional framework in 2022.[1.]

Unlike the previously utilized residency training model, CBD combines a time-based and outcomes-based approach, creating a flexible curriculum for residents.[1] Improving resident learning and competency are the driving factors behind the transition to CBD.[1] The aim of CBD is to enhance patient care through improved learning and teaching in residency.[1] CBD uses entrustable professional activities (EPAs) to assess resident knowledge acquisition and the accomplishment of established, and measurable, competencies at all stages of training.[1] EPAs are speciality specific and include activities such as assessing unstable patients and providing targeted treatment.[1] The Royal College proposes that the CBD curriculum will benefit trainees by providing clear learning expectations, opportunities for feedback and coaching, control over learning, and identifying gaps in knowledge.[1]

Radiology programs are currently in the early stages of deploying the CBD curriculum with the impact on resident training still largely unknown. The literature on residents' perceptions of the implementation of the CBD curriculum, particularly in the context of radiology programs, is limited.[2] As there is currently a paucity of information on the implementation of the CBD curriculum in the radiology specialty, the objectives of this study were to (1) explore perceptions of Radiology residents of the new CBD curriculum and (2) to determine areas in which further information and guidance may be required.

Methods

Research ethics

Research Ethics Board approval was obtained from the University of Saskatchewan, University of Manitoba, University of Calgary, University of Alberta, and the University of British Columbia.

Study design and recruitment

Radiology residents from five radiology residency programs in Western Canada were asked to participate in an online survey. These programs included the University of Saskatchewan, University of Manitoba, University of Calgary, University of Alberta, and the University of British Columbia. Program directors and/or program administrators at each institution were asked to distribute the link to the online survey to all radiology residents in their respective programs. The program directors and administrators were asked to report the total number of current residents in their programs. The survey was available online for a period of 30 days. A reminder email was sent at the half-way mark. Participants were informed that the survey was anonymous and voluntary. Consent was implied with participant completion of the survey. All participants were provided with the contact information of the researchers if they required further information. All participants understood that they could withdraw from the survey at any time without any repercussion or effect on their standing in their current training program as the survey was independent of their training program.

The online survey consisted of 21 questions containing an assortment of question formats, including 5-point Likert-scale responses, multiple-choice questions, and free text responses. The questions were developed after reviewing previous literature assessing CBD curricula.[3] The survey questions (Appendix 1) were designed to assess resident understanding of the main themes of CBD, areas of concern, potential benefits, potential challenges, and overall perspectives of the CBD model.

Data Analysis

The survey was designed and administered using SurveyMonkey. Summary and descriptive data statistics were performed on the responses to Likert-scale and multiple-choice questions.

Results

Demographics

A total of 21 residents participated. Residents from each of the five radiology residency programs were represented. The cohort consisted of 7 females, 13 males and 1 individual identifying as other. Individuals from each year of training (PGY-1 through PGY-5) participated in the survey.

Overall understanding of CBD

76% of residents rated their knowledge of CBD as above average or average. However, 52% reported they needed further information on all aspects of CBD (Figure 1). All respondents were of the understanding that the length of training would not change under the CBD model.

Additional survey questions were designed to obtain a greater understanding of resident perspectives on feedback and coaching, learning and gaps in knowledge, and quality of training and preparedness (Figure 2).

Feedback and coaching

None of the respondents strongly agreed and 19% agreed with the statement that the CBD model will allow for more 1-on-1 coaching opportunities with preceptors, with a greater percentage disagreeing (24%) or strongly disagreeing (14%).

Learning and addressing gaps in knowledge

A higher percentage of respondents disagreed (43%) or strongly disagreed (14%) with the statement that the CBD model will provide sufficient time to complete EPAs, with none agreeing or strongly agreeing. More respondents (33%) disagreed or strongly disagreed (14%) that the CBD model will allow more control over learning. More than half of the respondents agreed (38%) or strongly agreed (14%) that extra time will be beneficial once the required elements of CBD were met, with about two thirds reporting they would spend this extra time on studying.

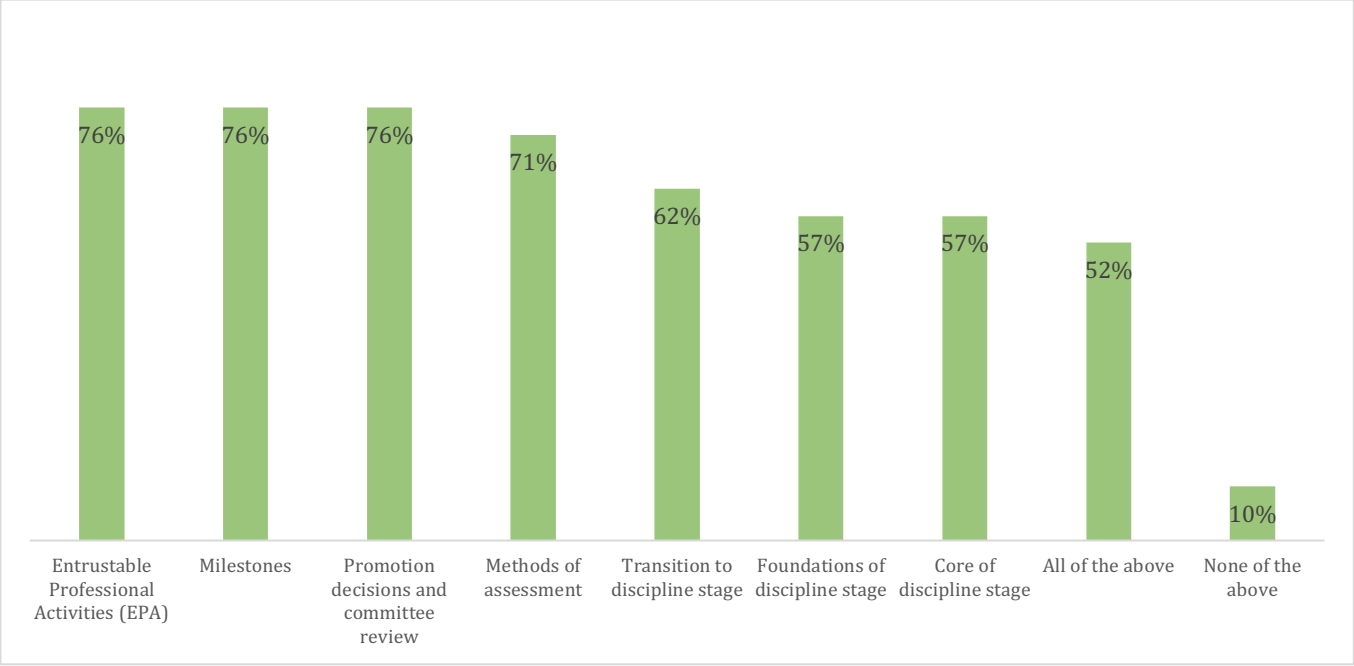

Figure 1: Aspects of CBD residents require more information on.

Impact on quality of training and resident preparedness

Respondents were mixed on whether dividing residency training into measurable milestones and reported case exposure would be an improvement, with 48% reporting an expected improvement and 52% reporting no expected improvement. Most residents reported they disagreed (43%) or strongly disagreed (19%) that the CBD model would be more beneficial compared to the traditional training model. Few respondents (10%) reported their overall perspective of the CBD model as positive. The remaining 90% reported their perspective as indifferent or negative.

Free-text responses

A consistent theme of the free-text responses was the challenge of completing the documentation required to track progress for the CBD curriculum. Respondents expressed that the CBD curriculum will introduce unnecessary documentation and additional administrative duties to track progress. Residents are concerned about the increased time and effort that will go into acquiring and recording feedback, believing this will take valuable time away from learning and teaching.

Additional survey questions were designed to obtain a greater understanding of resident perspectives on

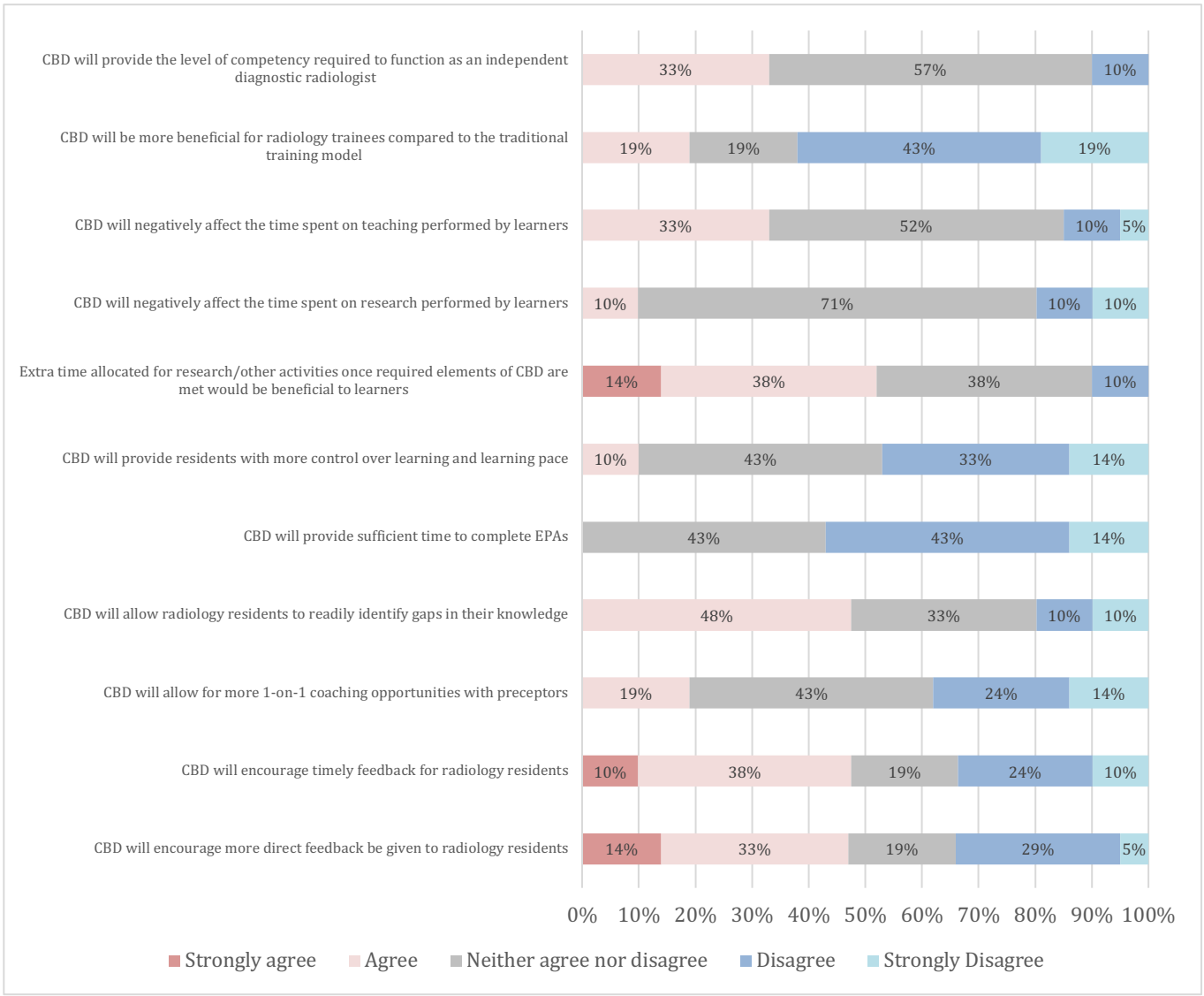

Figure 2: Resident responses to survey questions on the impact of CBD on feedback and coaching, learning and gaps of knowledge, and quality of training and resident preparedness.

feedback and coaching, learning and gaps in knowledge, and quality of training and preparedness (Figure 2).

Discussion

Exploring resident perceptions to identify potential areas of concern, while the CBD curriculum is still in its infancy, will help cultivate a stronger learner-centered curriculum moving forward.[4]

Overall perceptions of CBD

The survey results indicate that the overall perception of residents on the CBD curriculum was negative or indifferent. This finding is likely due to a lack of familiarity with specific aspects of CBD and concerns and barriers identified by the respondents.

A majority of the respondents identified further information is needed for EPAs, milestones, promotion decisions, and the committee review process (Figure 1). These aspects of CBD form a significant portion of the curriculum. EPAs are integral to CBD and are intended to facilitate increased opportunities for learning, feedback, and coaching.[5] Milestones and EPAs are also used in promotion decisions by the competence committee.[6] Residents have reported limited access to and the limited utility of current CBD resources.[7] Access to radiology specific CBD resources to further develop resident knowledge is required.[7] Working on bridging the gaps in knowledge, particularly on core aspects of the CBD curriculum, will aid residents in understanding their expectations and responsibilities as learners. The unfamiliarity with the major components of CBD and the perceived lack of benefits from adopting this new model of learning, has been previously noted to foster hesitancy amongst residents in other specialty training programs.[8]

The identified lack of time to complete EPAs and the time required to complete EPAs to track progress in the setting of a busy and rigorous residency were perceived to be major barriers by the residents. None of the residents were of the view that the CBD model will provide sufficient time to complete EPAs. This was also a common concern amongst learners in other medical residency programs.[3]

Residents viewed the ability to readily identify gaps in knowledge as an advantage of the CBD curriculum. While residents expressed concerns with the time and effort that evaluation will require, they did feel that timely and direct feedback was a benefit of the CBD model. Implementing a brand-new postgraduate education curriculum presents many challenges and relies on the involvement of various stakeholders.[7] Working towards achieving active engagement from residents, faculty, and other key stakeholders, is integral during the transition to CBD. Initial efforts should be focused on employing methods to minimize the challenges of CBD implementation identified by residents.[7]

Shared perceptions of CBD across disciplines

The findings of this study are comparable to resident perceptions of CBD in other residency programs. Residents across disciplines agree that a primary advantage of the CBD curriculum is regular assessment and feedback.[9] While residents perceive increased assessment as a benefit of CBD, they remain uncertain about the logistical challenges associated with obtaining assessments.[9]

The greatest disadvantage perceived by residents across other specialties was the increased time and resources required to complete assessments.[9] An additional disadvantage expressed by residents was the potential for assessment burden and fatigue.[9] A previous study focused specifically on the administrative burden of CBD from the faculty's perspective.[10] Residents and faculty alike raised time and administrative challenges as a major concern of the CBD model.[10]

Addressing resident concerns early in the CBD implementation process will encourage long term engagement and provide an opportunity to improve the curriculum.[3, 4] In particular, addressing concerns surrounding assessment fatigue and time constraints is crucial to allow for a successful transition to the CBD curriculum.

Future direction

This survey focused on the five Western Canadian Radiology programs. Expanding the survey to include additional radiology programs in Canada would potentially allow for more widely applicable results and would increase participant numbers to allow for the analysis of differences across demographic characteristics and different institutions. Tracking resident perception and understanding of the CBD curriculum will be beneficial to continue addressing barriers and concern, ultimately enhancing the delivery of the program for trainees.[3]

Limitations

A limitation of this study is the relatively small sample size. While the survey was distributed to each of the five Radiology programs, it was left to the discretion of the program directors to communicate directly with their residents. Other possible factors contributing to a low survey response rate include the voluntary nature of the survey. There may also be a selection bias whereby residents with strong opinions about the CBD curriculum were more inclined to participate in the study.

During the planning and implementation phase of this project it became evident that the infrastructure available to deal with communication, multi-site research ethics reviews, and the provision of information to potential participants posed some very significant logistical challenges for a project of this nature. The challenges presented to the researchers in this regard limited the ability to recruit a larger study group.

Conclusion

Designing and implementing a new resident education curriculum comes with challenges. While CBD is still in its infancy, and the long-term outcomes of the new curriculum remain unknown, identifying and addressing concerns in the early stages may serve to foster positive outcomes in the future. Resident perceptions play an integral role in the success of the CBD curriculum. The overall perception of a CBD curriculum held by radiology residents surveyed was negative or indifferent. Addressing resident concerns and bridging gaps in knowledge during the curriculum implementation phase will encourage engagement and enhance the CBD curriculum for learners.

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Conflict of interest

None.

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Appendix 1 – Survey Questions

1. Your gender:

- Male
- Female
- Other
- Not listed: _____
- Prefer not to disclose

2. What is the highest level of education you have attained prior to Radiology residency?

- No degree
- Bachelor's
- Master's
- PhD
- MBA
- Other – please specify

3. Which year of training are you in?

- PGY1
- PGY2
- PGY3
- PGY4
- PGY5
- PGY6 and up

4. How would you rate your current knowledge of Competency by Design (CBD)?

- Far above average
- Above average
- Average
- Below average
- Far below average

5. Do you think CBD will change the length of the radiology residency program from 5 years?

- Yes – it will increase the length of training
- Yes – it will decrease the length of training
- No – it will remain the same

6. Which aspects of CBD do you need more information on? Choose all that apply.

- Entrustable Professional Activities (EPA)
- Milestones
- Transition to discipline stage
- Foundations of discipline stage
- Core of discipline stage
- Transition to practice stage
- Promotion decisions and committee review
- Methods of assessment
- All of the above
- None of the above

7. The CBD model will encourage more direct feedback be given to radiology residents.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

8. The CBD model will encourage timely feedback for radiology residents.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

9. The CBD model will allow for more 1-on-1 coaching opportunities with preceptors.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

10. The CBD model will allow radiology residents to readily identify gaps in their knowledge.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

11. The CBD model will provide you with sufficient time to complete your EPAs.

    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

12. The CBD model will allow you to have more control over your learning and learning pace.

    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

13. If you were allocated extra time for research and other activities once the required elements of the CBD curriculum were met, would this be beneficial to you as a learner?

    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

14. If you were allocated extra time once the required elements of the CBD curriculum were met now would you utilize this time?

    - Time to study
    - Research
    - Teach
    - Self-directed learning projects
    - Other

15. CBD will negatively affect the time spent on Research performed by learners.

    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

16. CBD will negatively affect the time spent on Teaching performed by learners.

    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

17. Do you think that breaking residency training into measurable milestones and reported case exposure will be an improvement? E.g., diagnose subarachnoid hemorrhage and understand the pathophysiology of this abnormality.

    - Yes
    - No

18. As a radiology trainee, you will benefit from the CBD model compared to the traditional training model.

    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

19. At the end of your training, the CBD model will provide you with the level of competency required to function as an independent diagnostic radiologist.

    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

20. What is your overall perspective of the CBD model?

    - Positive
    - Indifferent
    - Negative

21. Please provide us with any additional comments or concerns that you would like to share.