Resident Doctors of Canada | Médecins résidents du Canada

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

Competence by Design:

Resident Physician Pulse Check

Report from the 2021 Collaborative Study

Released September 2022

Table of Contents

Table of Contents 2
Executive Summary 4
Key Findings 5
Overall Implementation 5
Implementation of Key Components 5
Challenges 5
Benefits 6
Resident Wellness 6
Discussion 7
Variability in implementation 7
Impact on Health and Wellness 8
Embracing the Benefits 9
Limitations 9
One Piece of the Puzzle 10
Next Steps 10
Background 12
Methods 13
Survey Development 13
Participants 13
Survey tool and distribution strategy 13
Consent and Confidentiality 14
Results 15
Response Rates 15
Overall Response Rate 15
Response Rate by Institution 16
Response Rate by Discipline 16

Overall Implementation 18
Key Component Implementation 21
Curriculum Mapping 22
Direct Observation 25
Workplace-Based Entrustable Professional Activity (EPA) Assessment 27
Coaching in the Moment 30
Coaching Over Time 33
Electronic Portfolio 36
Competence Committee 40
Individualized Resident Physician Stage-Based Learning Plans 43
Resident Physician Education on CBD 46
Challenges, Benefits, and Impact on Health and Wellness 50
Program Support 58
Discussion 59
Variability in implementation 59
Overall Implementation 59
Key Component Implementation 59
Appendix A: Project Team 64
Appendix B – Survey Questions 65

Executive Summary

INTRODUCTION

This report outlines the findings of a study that was undertaken collaboratively by Resident Doctors of Canada (RDoC) and the Royal College of Physicians and Surgeons of Canada (Royal College) to better understand resident physicians' experiences with the implementation of Competence by Design (CBD). The Resident Pulse Check study is based on the Royal College's Program Director Pulse Check study but was adapted specifically to the resident physician population.

The study involved an electronic survey conducted in the fall of 2021 to measure resident physicians' experiences with CBD implementation, and the level of implementation of critical components (key components) of CBD, including:

- Curriculum mapping
- Direct observation
- Workplace-based entrustable professional activities (EPA) assessment
- Coaching in the moment
- Coaching over time
- Electronic portfolio
- Competence committees
- Individualized resident stage-based learning plans

Resident physicians were asked questions regarding the benefits and challenges encountered with CBD implementation, as well the impact the transition to CBD has had on resident physicians' health and wellness.

The survey was open for one month. During this time, 649 resident physicians participated (15% of the targeted physicians[1]). Responses included representation from resident physicians across 13 institutions and from 37 of the 41 disciplines that had officially launched CBD at the time of the survey.

[1] Residents who were in programs that had officially launched CBD at the time of the study. Residents from Quebec institutions were not surveyed as they are represented by the Fédération des médecins résidents du Québec (FMRQ). The FMRQ has their own survey for residents and chose not to participate in this collaboration.

Key Findings

Overall Implementation

Survey respondents were asked the extent to which they agreed with the statement "Overall, CBD implementation is going well in my local program" on a five-point scale from strongly disagree to strongly agree. Overall, responses were highly variable, with 36% of respondents who strongly disagreed or disagreed with the statement, 37% who agreed or strongly agreed, and 26% who neither agreed nor disagreed. The distribution in ratings varied by discipline and institution.

Implementation of Key Components

The key components and their associated scales were constructed through a process termed Innovation Configuration mapping. The "key components" represent the unique parts of the innovation that make up the whole; in this case CBD (Hall & Hord, 2015). The scales for each key component represent the range in variations from idealized implementation of that component to non-implementation (Hall & Hord, 2015). Using this tool, it was possible to measure the fidelity of implementation, or the extent to which critical components of CBD were present in each program. Where a program best matched within the list of documented observable variations was indicative of where they fell on a scale that reflected the fidelity of the implementation (Hall & Hord, 2015).

Components reportedly implemented with higher fidelity	Components reportedly implemented with lower fidelity
Competence Committees Electronic portfolio	Coaching in the Moment Direct Observation Workplace-based Assessment Individualized Stage-Based Learning Plans

Like the overall rating of implementation, the level of key component implementation varied by discipline and institution.

Challenges

Respondents most frequently cited the challenge of having faculty complete EPA observations. Comments indicated that residents experienced situations where some faculty were too busy to complete them, some were unwilling or refused, and some faculty said they would complete them later but then neglected to do so, letting the EPA observations expire.

Residents also reported challenges finding opportunities to complete all the required EPA observations, whether it was that the EPA wasn't frequently encountered, that there was a lack of opportunity to be directly observed, or because of the large numbers of EPAs and contexts required by the EPA assessment plans.

Residents often reported feeling like the onus was entirely on them to initiate EPA observations and to track down busy faculty to complete EPA observations. Keeping track of all the EPAs and their specific assessment plans was also indicated as a challenge and created an administrative load that was time-consuming and cognitively demanding to manage.

Benefits

Receiving feedback was a commonly cited benefit of CBD. Resident physicians indicated that they appreciated frequent, in-the-moment feedback that is specific and targeted to inform their learning.

Clarity around learning requirements and expectations was also indicated as a benefit of CBD. Knowing what to expect and having a clearly defined learning path helped relieve feelings of uncertainty.

Resident physicians also commented that the documentation of experiences allowed them to track their progress and identify where there are gaps in their learning, allowing for a more intentional and focused approach to seeking out learning experiences.

Resident Wellness

Survey respondents were asked to rate how CBD had impacted their health and wellness on a 5-point scale, ranging from a strong negative impact to a strong positive impact. A large portion of the respondents indicated that the transition had resulted in a negative impact on their health and wellness, with 35% indicating it has had a small negative impact, and 38% indicating it has had a large negative impact. The stress from chasing faculty to complete EPA observations, the administrative burden, and the worry about achieving assessment requirements were the most frequently cited aspects of CBD causing a negative impact on health and wellness.

Fewer respondents reported that the transition had a positive impact, with 8% indicating that it had a small positive impact, and only 1% indicating that it had a large positive impact. The aspects of CBD having the greatest positive impact on health and wellness included clarity and awareness around expectations and progress, and feelings of being supported by the program.

Discussion

Variability in implementation

Overall Implementation

Overall, 36% of respondents disagreed with the statement that "Overall, CBD is going well in my program". This is in comparison to 63% who felt either neutral or agreed with this statement. When stratified by discipline however, there was significant heterogeneity in the level of agreement with this statement, with the percentage of those in disagreement ranging from 15% (Pediatrics) to 54% (Anatomical Pathology). Similarly, there were regional differences between institutions in level of agreement, with disagreement ratings by institution, ranging from 17% to 57%. These results suggest that there are contextual factors at each level (discipline, institution) that are playing a role in how CBD is being implemented, and there is a need to further analyze and evaluate what these specific factors are to identify opportunities for improvement.

Key Component Implementation

The extent to which key components of CBD were implemented, as experienced by respondents, was also highly variable. Certain components, such as competence committees and electronic portfolios had high fidelity, meaning that ratings from respondents indicated complete or close to implementation as intended. Conversely, components such as coaching in the moment, work-based EPA assessment, and direct observation were less likely to be rated as being completely implemented, indicating that these components had a lower level of fidelity of implementation. In the initial implementation, it was likely that programs were focused on implementing critical operational components of CBD, such as competence committees and electronic portfolios. However, less structural elements, such as coaching in the moment, may require more of a sustained focus on faculty development now that critical functional elements are in place.

Reasons for the incomplete implementation, and low fidelity of implementation, are suggested in the challenges section of the report. For instance, residents reported that it was often a challenge getting faculty to complete EPA observations in a timely fashion. This challenge can be connected to the incomplete implementation of components such as direct observations, workplace-based EPA assessment and subsequent coaching in the moment. Further exploration of how the challenges are connected to the implementation of key components could help identify opportunities for targeted interventions that lead to improvements.

Like overall implementation, there is a large amount of variability in the degree to which key components of CBD have been implemented across disciplines and institutions. Some disciplines and institutions are well on their way to achieving ideal key component implementation, as experienced by resident physicians, while others appear to be slowly progressing or struggling with implementation. This variability could be a reflection of how closely aligned to CBD a discipline or institution was prior to beginning the transition, rather than an indicator of implementation success versus non-success. For instance, some disciplines may have already had some of the components of CBD (e.g. direct observation, coaching) as part of their daily routine prior to the implementation of CBD. Variation might also be related to the phased roll-out of CBD that resulted in differing start dates by discipline, or the early adoption of aspects of CBD by some institutions. Again, a further look into why this variability exists and what factors contribute to the differing levels of implementation will be key to determining how and where to offer support or to help make any necessary adjustments or adaptations.

Impact on Health and Wellness

Previous work has identified that CBD is having an impact on resident physician health and wellness (e.g., FMRQ reports, Program Director Pulse Check reports, RDoC's National Resident Survey and focus groups, etc.). This survey provided the opportunity to ask resident physicians directly about the nature of this impact and what the driving factors were. Findings from the study confirmed that the transition to CBD has had a negative impact on health and wellness for many respondents.

Once again, there was substantial variability in the results between disciplines and between institutions, and there are likely a variety of reasons for, or factors contributing to, this variability. The narrative comments, however, identified the

following seven common themes as having the greatest negative impact on health and wellness in relation to the transition to CBD:

- Stress from chasing staff to do EPA observations
- Administrative burden
- Concerns about achieving requirements
- Concerns around utility/validity of CBD/EPAs
- Cognitive load
- Evaluation/performance anxiety
- Preoccupation with EPAs

The consistency in some answers, and the level of detail provided by residents to characterize these themes, offers not only opportunities for further investigation, but also for direct action. Finding ways to help alleviate the stress, worry, and workload associated with CBD implementation is a primary focus of on-going discussions around CBD. The information gathered from this study will help to inform these discussions and identify ways to improve the resident physicians' experience.

Embracing the Benefits

Results from this study not only reveal the challenges with CBD, but also provide an opportunity to highlight successes with the fidelity of implementation, as well as some signals of the integrity of implementation. Narrative comments indicate that some resident physicians are experiencing benefits with CBD implementation. Harvesting and sharing these benefits and positive experiences may offer an opportunity for understanding what aspects or strategies of implementation have allowed for some resident physicians to experience a more fruitful transition than others.

Limitations

While attempts have been made to ensure that the results from this survey are reflective of resident opinions across Canada, there are several limitations. The response rate for this survey was 15.1%. While this rate is similar to previous RDoC surveys and is satisfactory, it does mean that there are many residents who did not provide their unique experiences and perspectives. It is unknown if the group of residents who have responded differ from those who have not responded, raising the possibility of selection bias.

Additionally, this survey was conducted at a time when the impacts of COVID-19 were significant and when issues with physician wellness, healthcare capacity, and training site limitations were widespread for a variety of reasons. The issues are complex, and the solutions are not straightforward, and in some cases, challenges may have been exacerbated by the COVID-19 pandemic.

One Piece of the Puzzle

The Resident Pulse Check study is one of many initiatives and evaluations taking place across Canada to better understand the resident physician experience with CBD implementation. Acknowledging that this study is only one piece of the puzzle, the findings from this study are being reviewed in conjunction with data from other sources as plans for how to move forward are considered and adopted.

Both RDoC and the Royal College take the health, wellness, and education of residents very seriously and are committed to working both independently and collaboratively to improve the resident physician training experience. The following section highlights some of the next steps that are being considered and acted upon by the two organizations.

Next Steps

The Royal College plans to:

- Increase the focus on resident wellness in CBD through further investigation and collaboration.
- Further characterize the reasons for differences in the implementation between disciplines and institutions with the purpose of identifying areas for process improvement and implementation support.
- Target key components that have been identified by residents as having lower fidelity of implementation.
- Immediately initiate the development of strategies that address challenges identified by residents with the dual intent of improving the fidelity of implementation and resident wellness.
- Continue to develop and action plans for addressing challenges with workplace-based assessment.

RDoC plans to:

- Convene a team of resident content experts to thoroughly review and analyze data from this survey and other sources for the purpose of gaining a well-rounded picture of the resident experience of CBD.
- Develop a position paper on CBD that will inform advocacy on strategies to improve the resident experience of CBD.
- Prioritize strategies that have the greatest potential to increase resident well-being while maximizing opportunities to advance their medical education.

Together, the organizations plan to:

- Recognize the importance of collaboration both for resident education and resident wellness. Both organizations share in this important and common goal.
- Conduct serial administration of the survey to assess for change over time, evolution of novel challenges, and for effect of any implemented changes.
- Collaborate on projects/interventions that work to improve the resident experience (both educationally and psychologically).

Background

Competency-Based Medical Education (CBME) is being increasingly adopted around the world (Nasca et al., 2012, Frank et al., 2015, Caverzagie et al., 2017). Defined as "an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs", it de-emphasizes time-based training and promises greater accountability, flexibility, and learner-centeredness." (Frank et al, 2010).

The Royal College of Physicians and Surgeons of Canada (the Royal College) has implemented its own unique model of CBME termed Competence by Design (CBD). CBD is a complex, system-wide medical education intervention that requires a multi-dimensional, longitudinal, and collaborative program evaluation approach to effectively monitor implementation, challenges, and opportunities for improvement (Van Melle, Gruppen et al., 2017; Van Melle, Frank et al., 2017). Postgraduate medical education (PGME) stakeholders across the country are concurrently performing important evaluation work around CBD.

Finding opportunities to collaborate helps ensure that experiences and perspectives from across the diverse range of stakeholders are collectively captured and used to improve the system for everyone involved. With this collaborative approach in mind, members of Resident Doctors of Canada (RDoC) teamed up with members of the Royal College CBD Program Evaluation Operations Team (PE Ops) to develop, disseminate and analyze a survey that gathers the perspectives and experiences of resident physicians who are currently training in Canadian PGME programs that have implemented CBD. The information gained from this evaluation will be used to help monitor the fidelity of CBD implementation, and identify benefits, challenges, and opportunities for quality improvement, specifically as it relates to resident physicians' educational experience.

Methods

Survey Development

Members of the Royal College and RDoC (Appendix A) worked collaboratively to develop a survey based on the Royal College's Pulse Check survey for program directors but targeted to resident physicians' experience. Innovation Configuration mapping was used to define the key components of CBD and their associated scales. These "key components" represented the unique parts of the innovation that made up the whole, in this case CBD (Hall & Hord, 2015). The scales for each key component represented the range in variations from idealized implementation of that component to non-implementation (Hall & Hord, 2015). The completed innovation configuration map was incorporated into a survey (Appendix B) with the purpose of determining the fidelity of implementation; the extent to which critical components of CBD were present in a program. Where a program best matched within the list of documented observable variations was indicative of where they fell on a scale that reflected the fidelity of the implementation (Hall & Hord, 2015). In addition, the survey contained questions regarding the benefits and challenges encountered during CBD implementation, education and support available, and the impact of CBD on resident physician wellness. The survey was piloted with resident physicians prior to launch.

Participants

The target population for the survey were resident physicians who began their current residency/fellowship training in a discipline that had officially transitioned to CBD at the time of the study (i.e., disciplines that launched between 2017 and 2020, inclusive). RDoC worked with Provincial Housestaff Organizations (PHOs) across Canada to distribute the survey. Quebec resident physicians were not surveyed as they are represented by the Fédération des Médecins Résidents du Québec (FMRQ), and the FMRQ declined the invitation to participate in the study.

Survey tool and distribution strategy

The survey was hosted on Alchemer, a secure web-based survey software used by the Royal College. The distribution of the survey to the eligible resident physicians was coordinated by RDoC and disseminated by the PHOs.

Image retrieved from RDoC website

The survey was open for four weeks, initially launching on October 5th, 2021, via an email invitation through the PHOs. A reminder email was sent two weeks following the launch. Resident physicians were also encouraged to participate through a series of social media posts that were sent out as part of a social media campaign.

Consent and Confidentiality

The study was voluntary, and consent was assumed when a participant began the survey. The option to withdraw from the survey was always available. Participant information pertaining to the residents' discipline, program year, and institution was collected at the start of the survey, however, this information was only collected to:

- Determine sample representativeness.
- Enable cross group comparisons at an aggregate level.
- Share aggregate anonymized institutional level data with institutions when there are enough responses from that institution to protect respondent anonymity (greater than 10).

Individual or program level responses would not be divulged, shared, or used in a way that would result in respondent identification. This assurance of confidentiality was explicitly stated in the email invitation, as well as at the start of the survey.

Results

Response Rates

Overall Response Rate

Overall Response Rate = 15.1%
(649 responses/4302 CBD residents*)

*This estimated number of residents is based on the 2021/2022 CAPER census data.

Included in the resident number calculations:

- Residents in disciplines that have officially launched CBD according to the Royal College rollout schedule.
- Residents enrolled at a Canadian postgraduate medical institution, excluding Québec institutions.
- Residents who started their current training program in the CBD stream. For example, the number of CBD residents in Anesthesiology (a discipline that launched in 2017) includes residents in PGY1, PGY2, PGY3, PGY4, PGY5, whereas the number of CBD residents in Pediatrics (a discipline that launched in 2021) includes only residents in PGY1.

Response Rate by Institution

Responses were received from residents across all 13 institutions included in the study.

Table 1: Response rates by institution

Institution	# of responses/ # of CBD residents by institution	Responses Rate
University of British Columbia	71/558	13%
University of Alberta	71/375	19%
University of Calgary	51/324	16%
University of Manitoba	54/240	23%
University of Saskatchewan	37/204	18%
University of Western Ontario	39/362	11%
McMaster University	67/414	16%
Northern Ontario School of Medicine	16/48	33%
University of Toronto	102/812	13%
Queen's University	25/206	12%
University of Ottawa	58/378	15%
Dalhousie University	46/257	18%
Memorial University of Newfoundland	12/113	11%
Total	**649/4302**	**15.2%**

Response Rate by Discipline

Residents from 34/41 (82%) of CBD launched disciplines responded to the survey. Table 2 provides a breakdown in the response rates by discipline.

Table 2 : Response rates by discipline

Discipline	# of responses/# of CBD residents	Response Rate
Adolescent Medicine	3/3	100%
Anatomical Pathology	41/97	42%
Anesthesiology	58/504	12%
Cardiac Surgery	4/31	13%
Cardiology (Adult)	4/49	8%
Cardiology (Pediatric)	2/10	20%
Child and Adolescent Psychiatry	4/6	67%
Clinical Immunology and Allergy (Adult)	4/9	44%
Clinical Pharmacology and Toxicology	1/1	100%
Critical Care Medicine (Adult)	8/64	13%
Emergency Medicine	34/282	12%
Gastroenterology (Adult)	3/70	4%
Gastroenterology (Pediatric)	3/8	38%
General Internal Medicine	39/118	33%
General Pathology	14/24	58%
General Surgery	22/160	14%
Geriatric Medicine	8/49	16%
Geriatric Psychiatry	1/4	25%
Internal Medicine	141/1224	12%
Medical Oncology	11/58	19%
Neonatal-Perinatal Medicine	1/2	50%
Nephrology (Adult)	2/54	4%
Nephrology (Pediatric)	1/12	8%
Neurology (Adult)	13/94	14%
Neurology (Pediatric)	2/17	12%
Neurosurgery	4/58	7%
Nuclear Medicine	2/7	29%
Obstetrics and Gynecology	40/235	17%
Orthopedic Surgery	14/116	12%
Otolaryngology - Head and Neck Surgery	7/120	6%
Pediatric Hematology/Oncology	1/4	25%
Pediatrics	48/134	36%
Physical Medicine and Rehabilitation	11/51	22%
Plastic Surgery	2/49	4%
Psychiatry	66/312	21%
Radiation Oncology	8/59	14%
Respirology (Adult)	5/32	16%
Rheumatology (Adult)	8/56	14%
Urology	4/101	4%
Vascular Surgery	1/9	11%
Total	**649/4302**	**15.1%**

Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Nephrology (Pediatric), Pediatric Surgery, Respirology, Rheumatology (Pediatric)

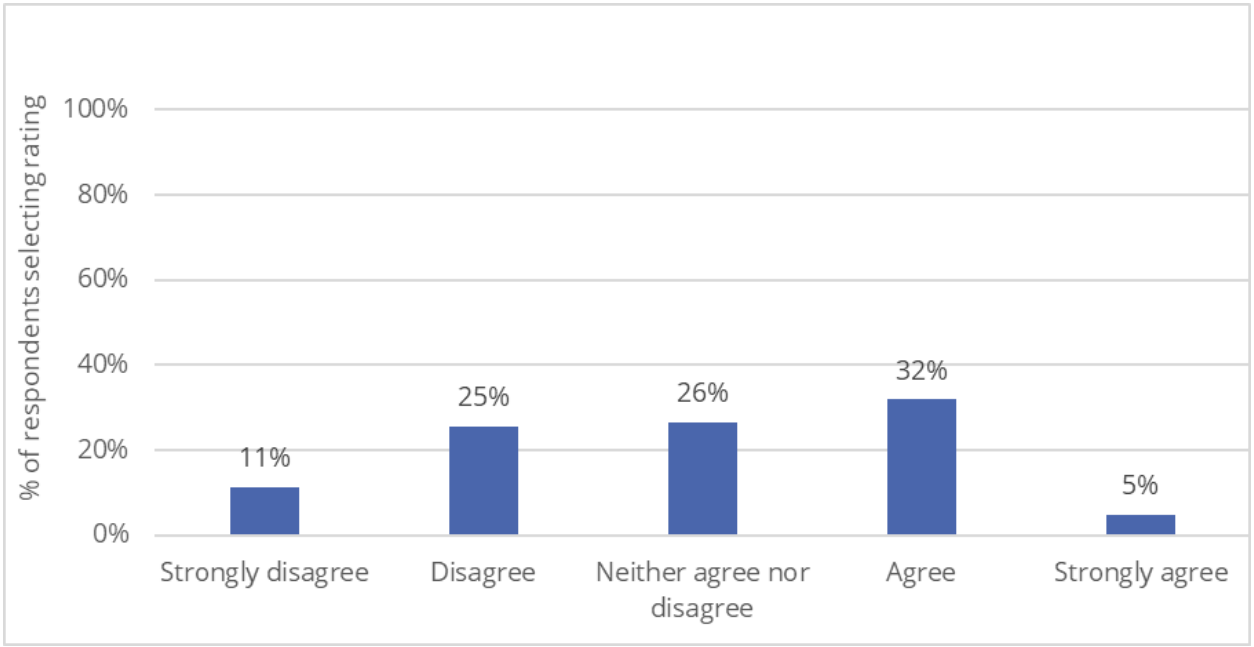
Table 2 : Response rates by postgraduate year

Postgraduate year	# of responses/# of residents	Response Rate
PGY-1	165/1351	12.2%
PGY-2	170/1209	14.1%
PGY-3	159/791	20.1%
PGY-4	81/540	15.0%
PGY-5	64/375	17.1%
PGY-6	12/34	35.3%

Overall Implementation

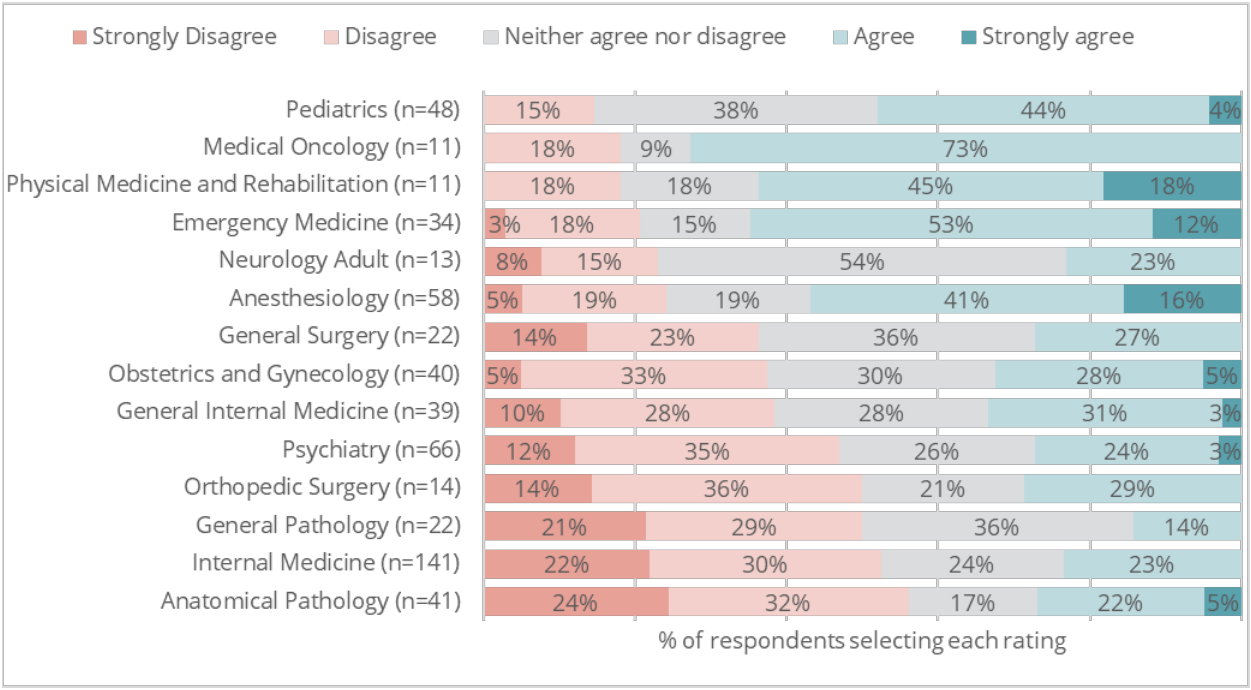
Survey respondents were asked the extent to which they agreed with the statement "Overall, CBD implementation is going well in my local program" on a five-point scale from strongly disagree (1) to strongly agree (5). The distribution of responses is presented in Figure 1.

Figure 1A : Overall : Level of agreement to statement : « Overall, CBD is going well in my program »



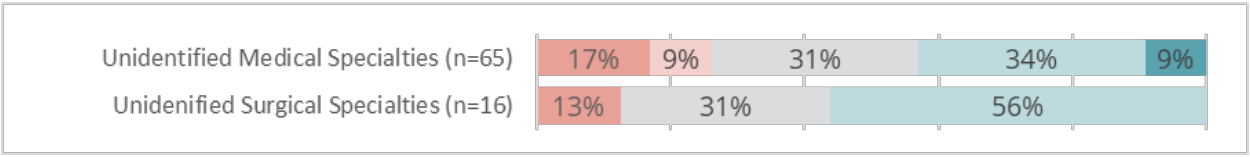
N=655

Figure 1B: Level of agreement to statement : « Overall, CBD is going well in my program » by discipline :



The disciplines were sorted in descending order by the total % of respondents who were neutral in their agreement or agreed or strongly agreed. The disciplines at the bottom of the graph had a greater percentage of respondents who did not agree that CBD was going well in their program compared to those at the top of the graph.

Disciplines with fewer than 10 responses have been grouped together into “unidentified” surgical or medical specialties

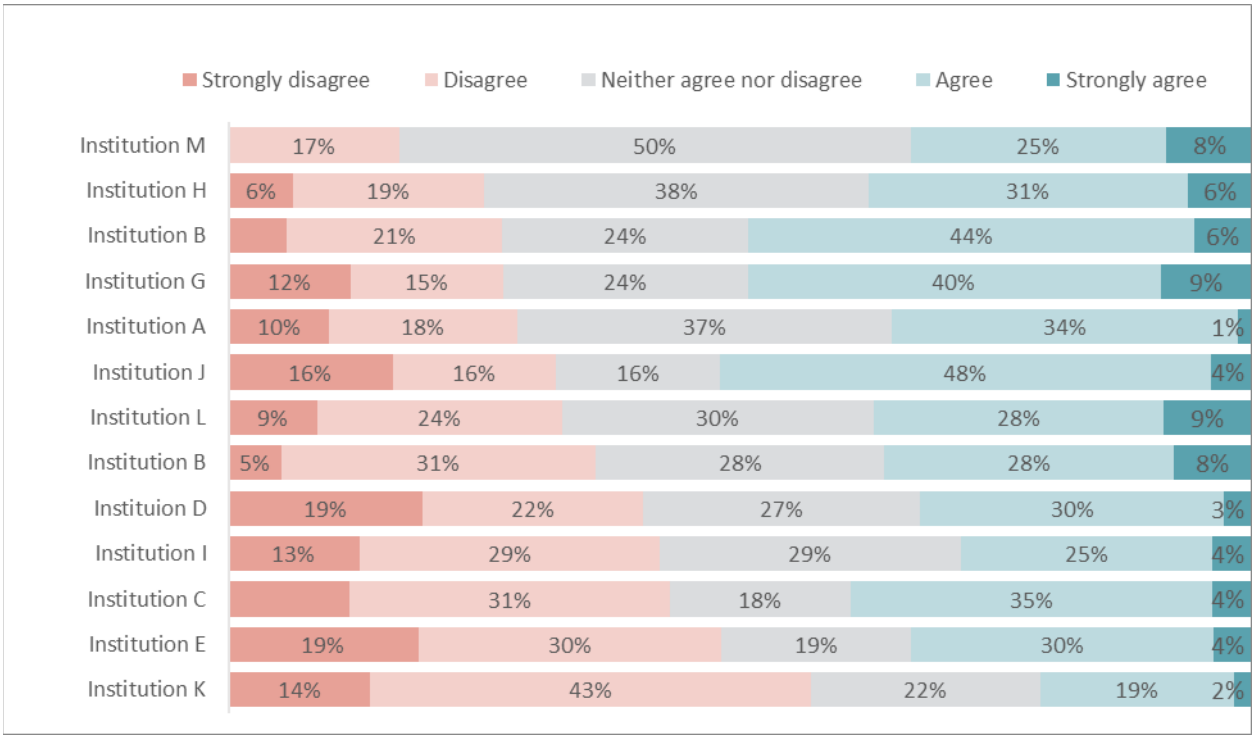


Unidentified surgical disciplines*: Cardiac Surgery, Otolaryngology Head and Neck Surgery, Plastic Surgery, Neurosurgery, Surgical Foundations, Urology, Vascular Surgery

Unidentified medical disciplines: Adolescent Medicine, Cardiology (Pediatric and Adult), Child and Adolescent Psychiatry, Clinical Immunology and Allergy, Clinical Pharmacology and Toxicology, Critical Care Medicine (Adult), Gastroenterology (Adult and Pediatric), Geriatric Medicine, Neonatal-Perinatal Medicine, Nephrology (Adult), Neurology (Pediatric), Pediatric Hematology Oncology, Radiation Oncology Respirology (Adult), Rheumatology (Adult)

Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Nephrology (Pediatric), Pediatric Surgery, Respirology, Rheumatology (Pediatric)

Figure 1C: Level of agreement to statement: « Overall, CBD is going well in my program » by institution:



The institutions were sorted in descending order by the total % of respondents who were neutral in their agreement or agreed or strongly agreed. The institutions at the bottom of the graph had a greater percentage of respondents who did not agree that CBD was going well in their program compared to those at the top of the graph.

Key Component Implementation

Survey respondents were asked to indicate the degree to which each of the following key components of CBD were taking place in their program.

- Curriculum Mapping
- Direct Observation
- Workplace based EPA assessment
- Coaching in the moment
- Coaching over time
- Electronic portfolio
- Competence committee
- Individual resident learning plans

Each key component is rated from non-implementation to ideal implementation, using unique component specific anchors that were developed using the Innovation Configuration Mapping tool, as previously described. The descriptions and distribution in ratings for each of the key components follow.

Curriculum Mapping

A curriculum map is a tool that shows how the parts of a curriculum are related to one another. In the case of CBD, it links competencies to learning experiences (e.g. rotations), assessment tools (e.g. exams), and CanMEDS roles throughout the stages of training (Ladhani & Writer, 2014). While a curriculum map can be presented in several ways, for resident physicians it is a tool that details the plan for their educational journey.

Figure 2A : Curriculum Mapping – Level of Implementation

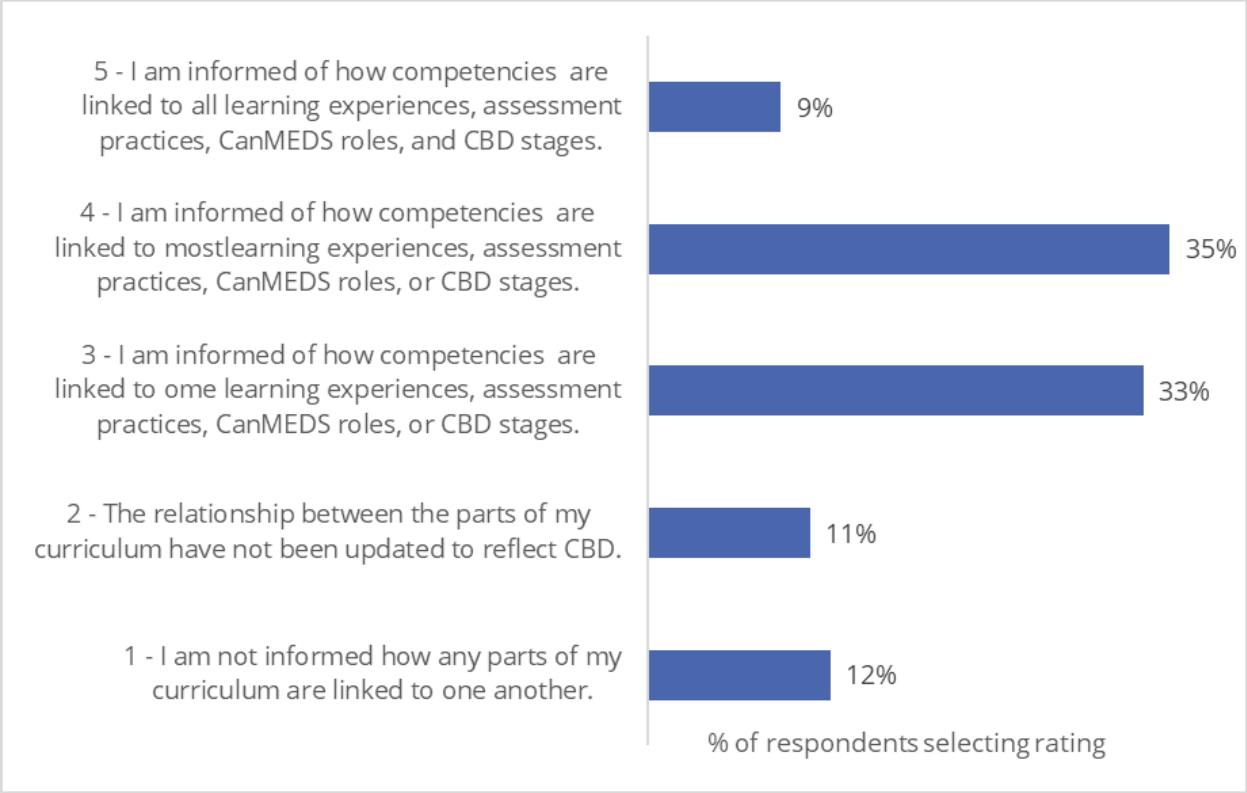


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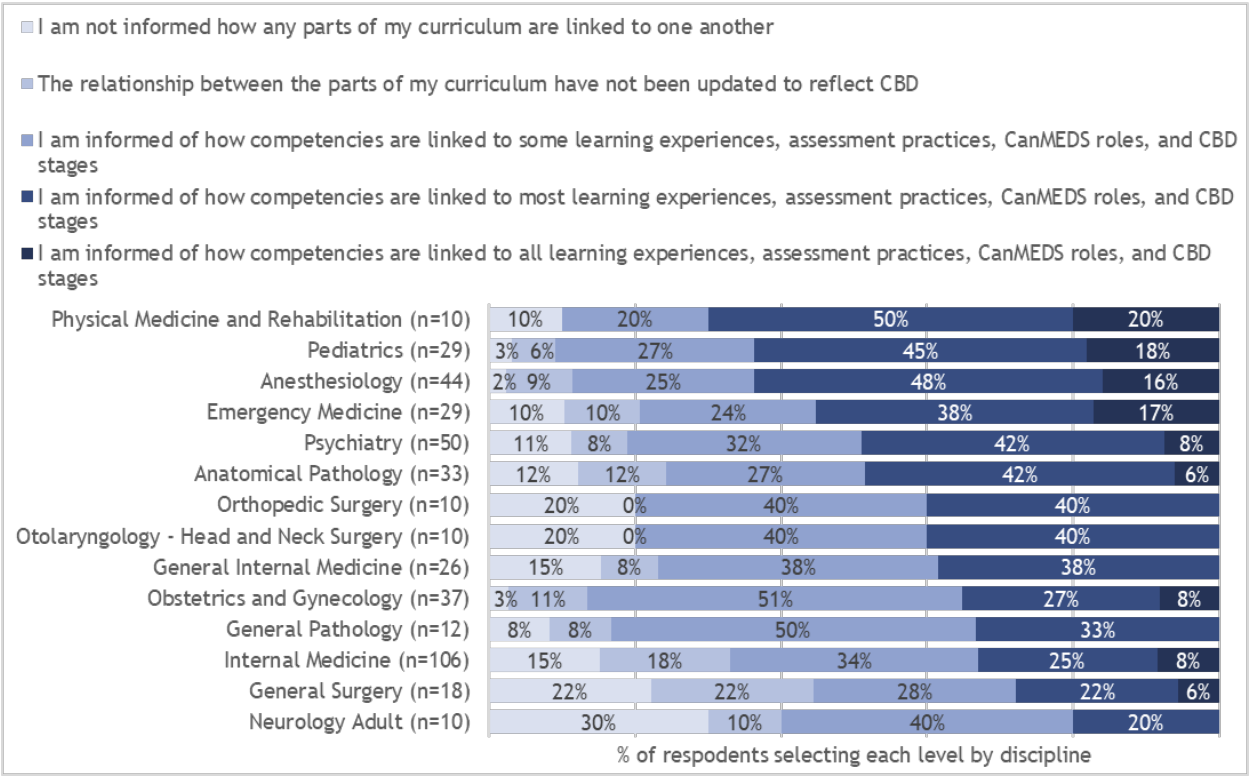
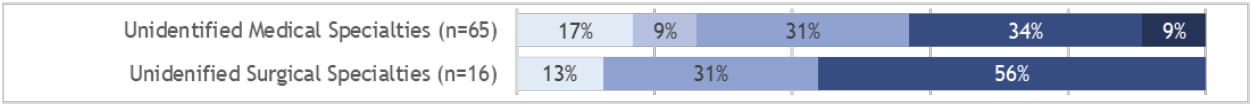
Figure 2B : Curriculum Mapping – Level of Implementation by discipline :



The disciplines were sorted in descending order by the % of respondents who selected the last two options on the implementation scale. The disciplines at the top of the graph had a greater percentage of respondents who experienced being further along in implementing the key component compared to those at the bottom of the graph.

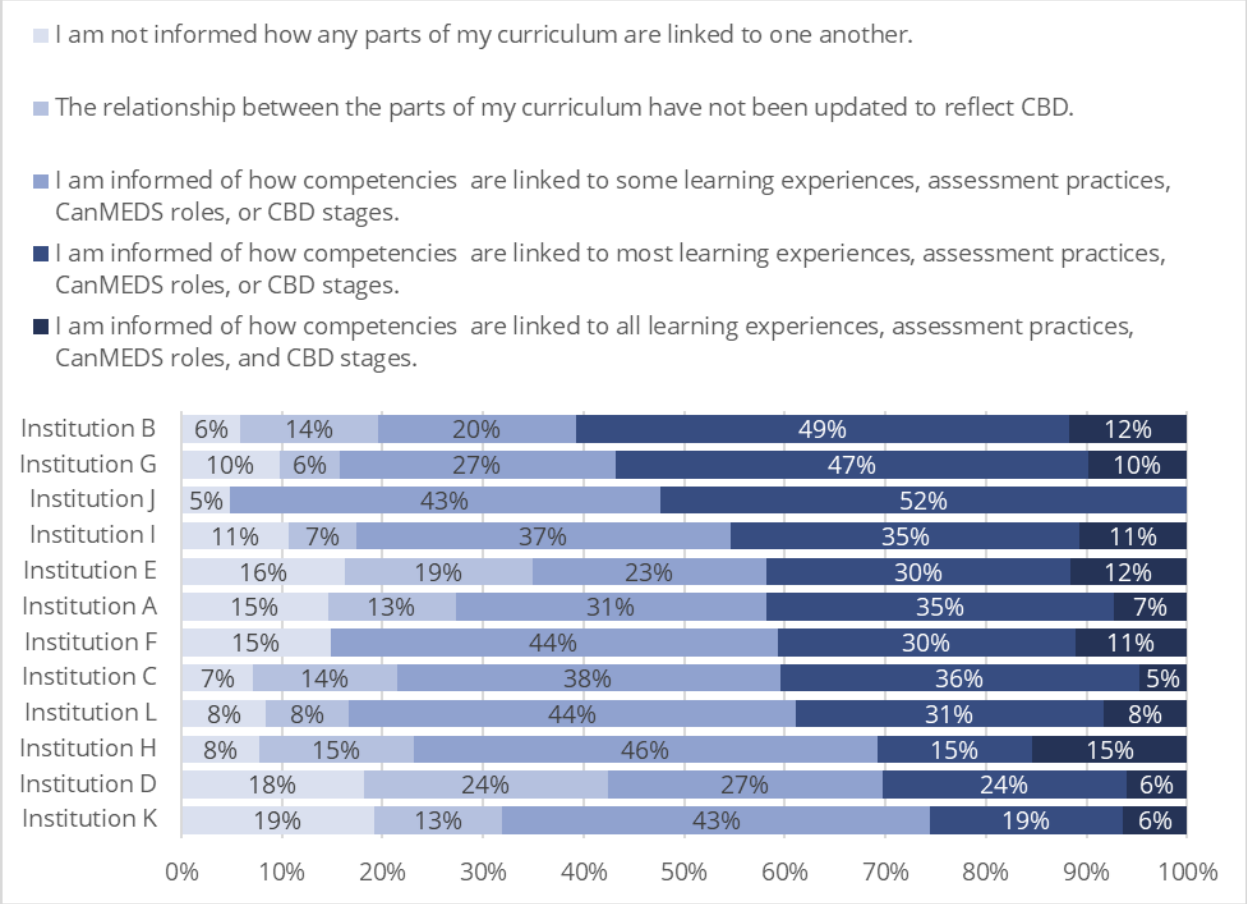


Unidentified surgical disciplines*: Cardiac Surgery, Plastic Surgery, Neurosurgery, Surgical Foundations, Urology, Vascular Surgery

Unidentified medical disciplines**: Adolescent Medicine, Cardiology (Pediatric and Adult), Child and Adolescent Psychiatry, Clinical Immunology and Allergy, Clinical Pharmacology and Toxicology, Critical Care Medicine (Adult), Gastroenterology (Adult and Pediatric), Geriatric Medicine, Medical Oncology, Neonatal Perinatal Medicine Nephrology (Adult and Pediatric), Pediatric Hematology Oncology, Radiation Oncology Respirology (Adult), Rheumatology (Adult)

Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Nephrology (Pediatric), Neurology (Pediatric), Pediatric Surgery, Respirology (Pediatric), Rheumatology (Pediatric), Vascular Surgery

Figure 2C : Curriculum Mapping – Level of Implementation by institution :



The institutions were sorted in descending order by the % of respondents who selected the last two options on the implementation scale. The institutions at the top of the graph had a greater percentage of respondents who experienced being further along in implementing the key component compared to those at the bottom of the graph.

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).

Figure 3A : Direct Observation – Level of Implementation

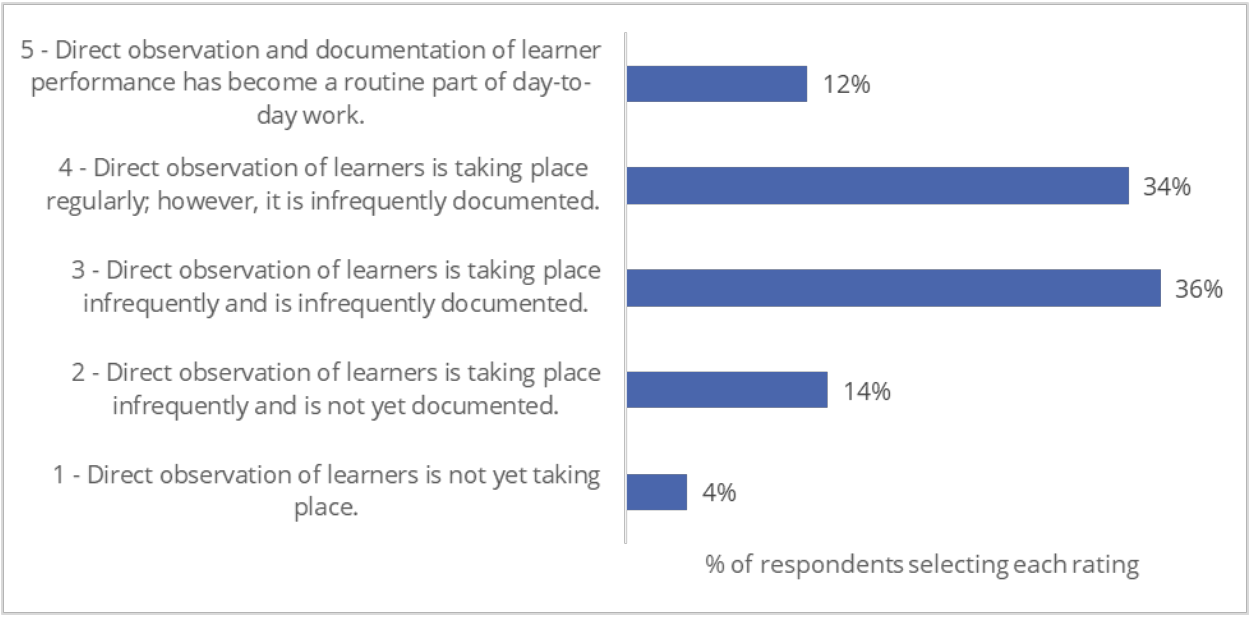


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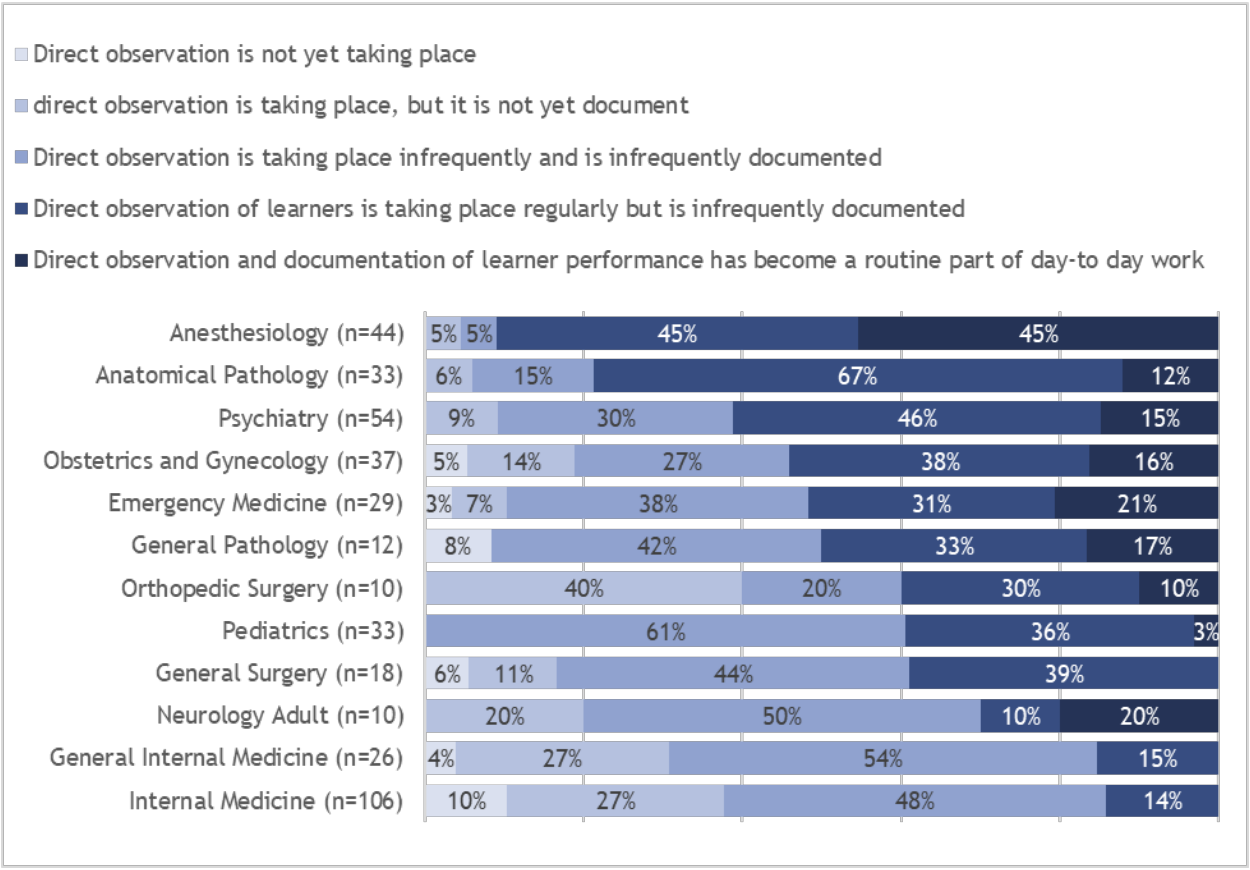
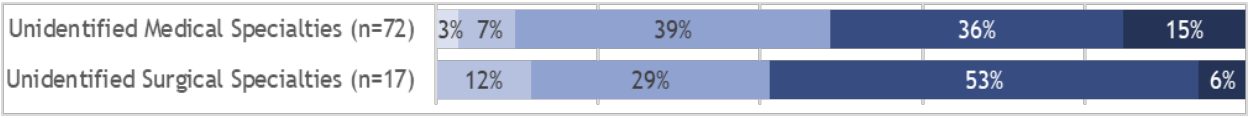
Figure 3B : Direct Observation – Level of Implementation by discipline :



The disciplines were sorted in descending order by the % of respondents who selected the last two options on the implementation scale. The disciplines at the top of the graph had a greater percentage of respondents who experienced being further along in implementing the key component compared to those at the bottom of the graph.



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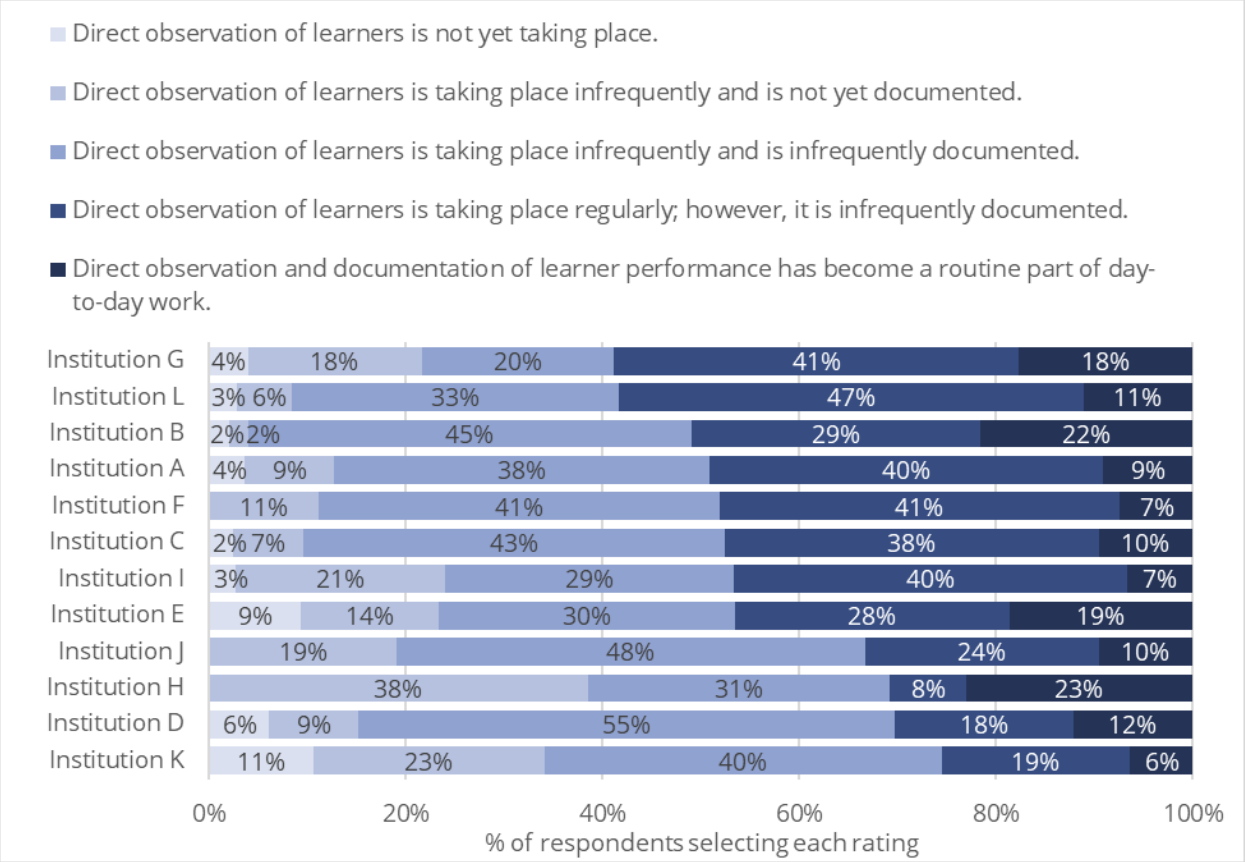
Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Nephrology (Pediatric), Neurology (Pediatric), Pediatric Surgery, Respirology (Pediatric), Rheumatology (Pediatric), Vascular Surgery

Figure 3C : Direct Observation – Level of Implementation by institution :



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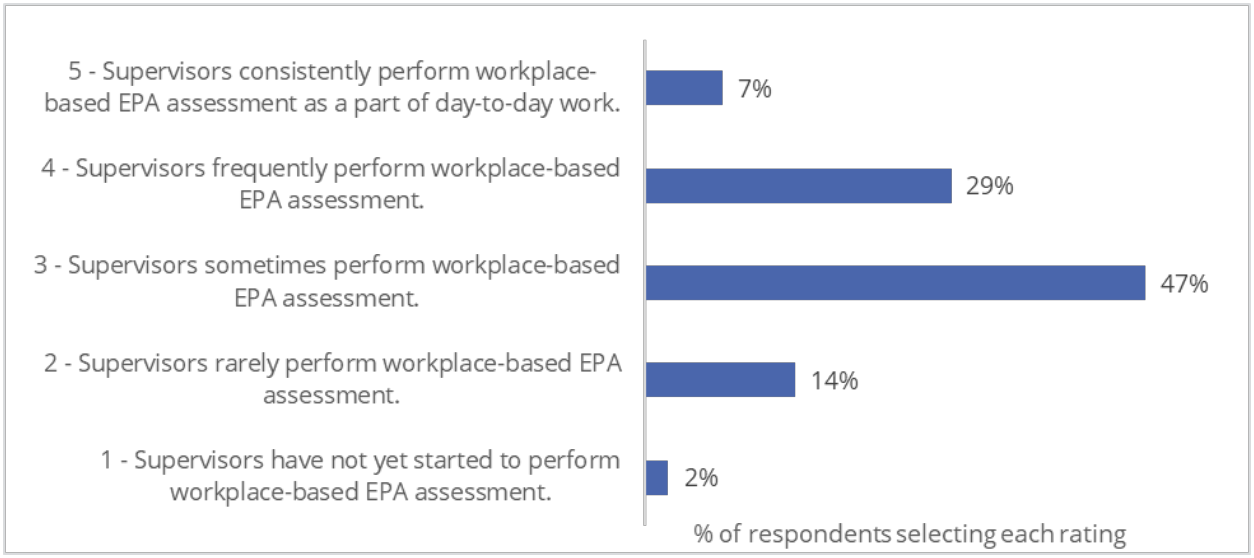
Workplace-Based Entrustable Professional Activity (EPA) Assessment

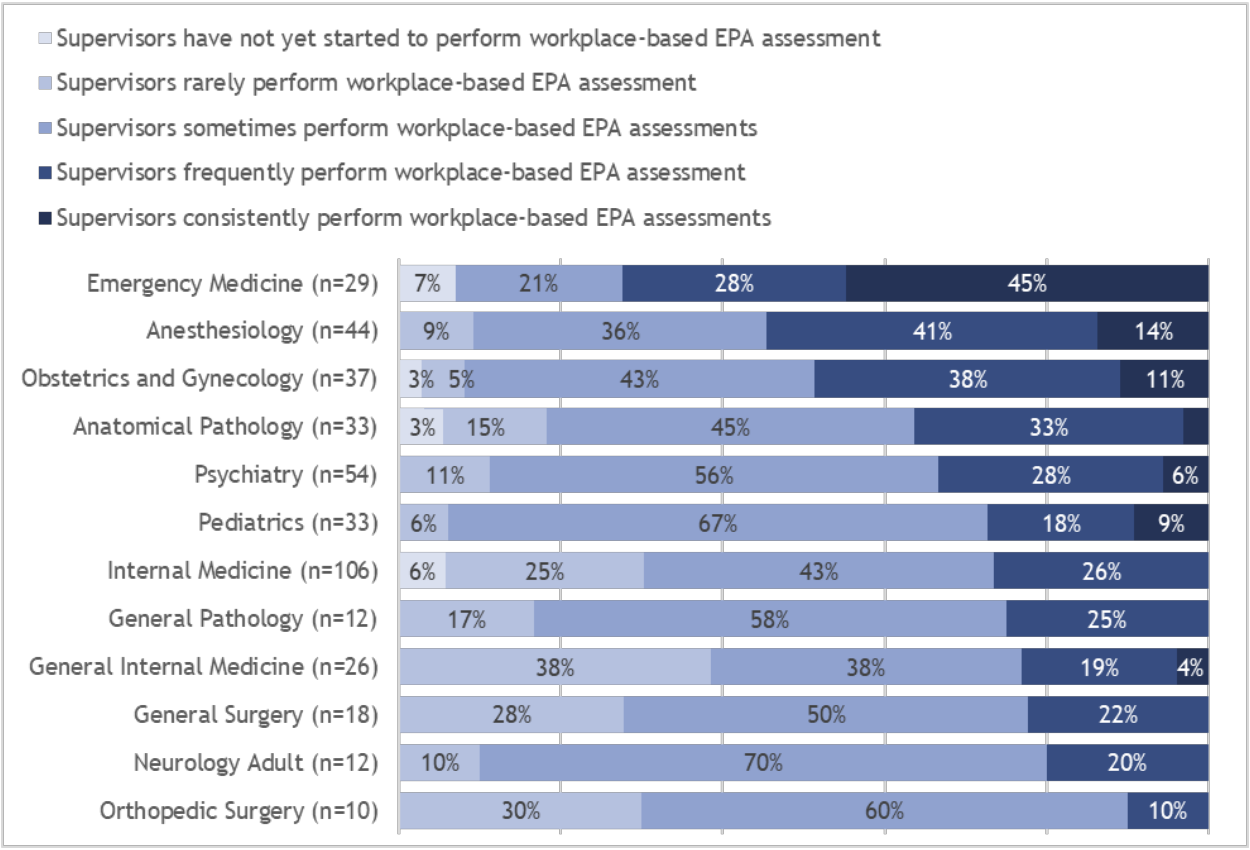
Workplace-based assessment involves the documentation of feedback generated by supervisors from real clinical observations for the purpose of trainee development and EPA achievement decisions. EPAs reflect the authentic work of physicians and provide explicit teaching, learning and assessment goals for resident physicians (Gofton, Dudek, Barton & Bhanji, 2017).

Figure 4A : Workplace-Based EPA Assessment – Level of Implementation



n=507

Figure 4B : Workplace-Based EPA Assessment – Level of Implementation by discipline :



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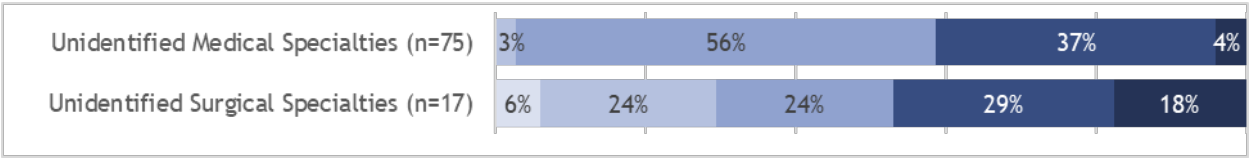

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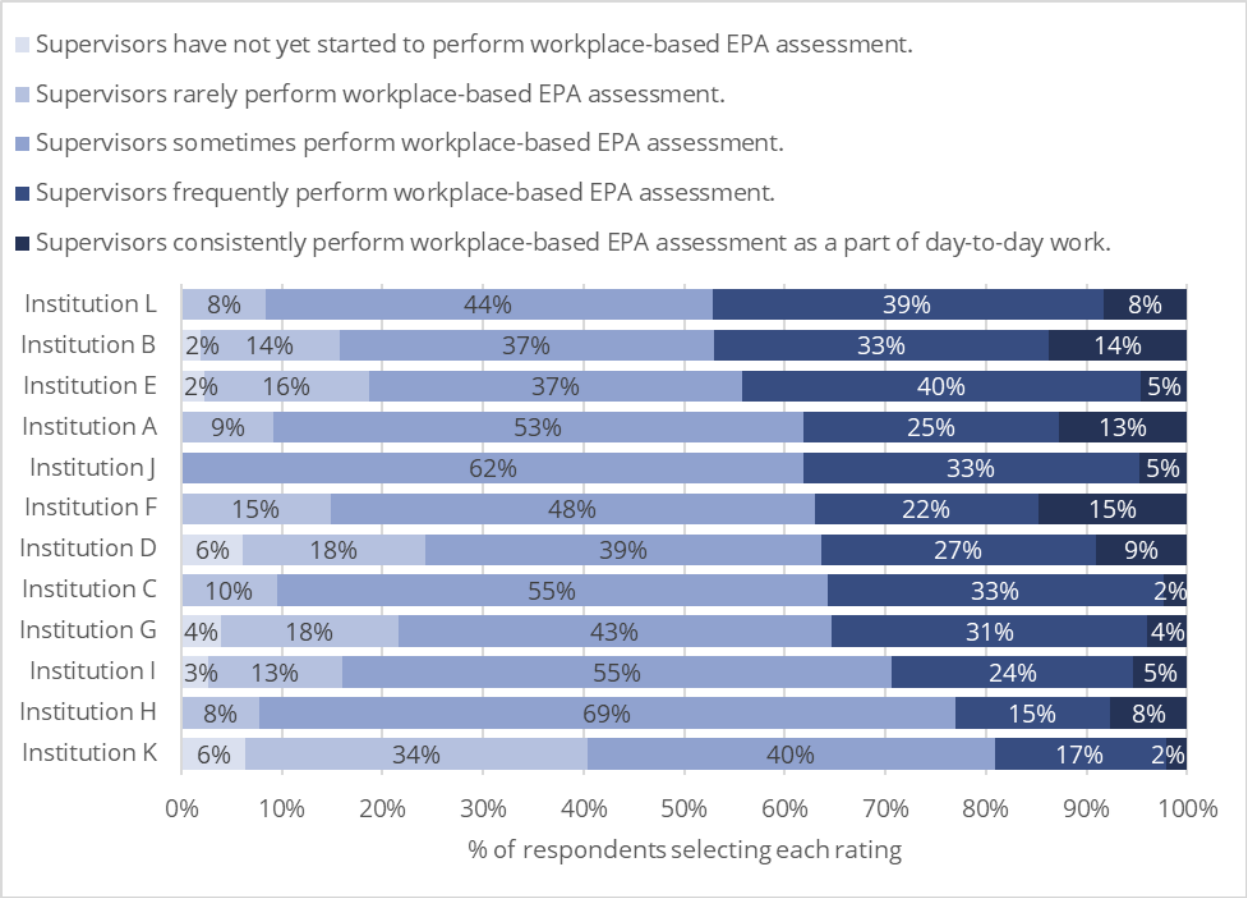
Unidentified medical disciplines**: Adolescent Medicine, Cardiology (Pediatric and Adult), Child and Adolescent Psychiatry, Clinical Immunology and Allergy, Clinical Pharmacology and Toxicology, Critical Care Medicine (Adult), Gastroenterology (Adult and Pediatric), Geriatric Medicine, Medical Oncology, Neonatal Perinatal Medicine Nephrology (Adult and Pediatric), Pediatric Hematology Oncology, Radiation Oncology Respirology (Adult), Rheumatology (Adult)

Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Nephrology (Pediatric), Neurology (Pediatric), Pediatric Surgery, Respirology (Pediatric), Rheumatology (Pediatric), Vascular Surgery

Figure 4C: Workplace-Based EPA Assessment – Level of implementation by institution:

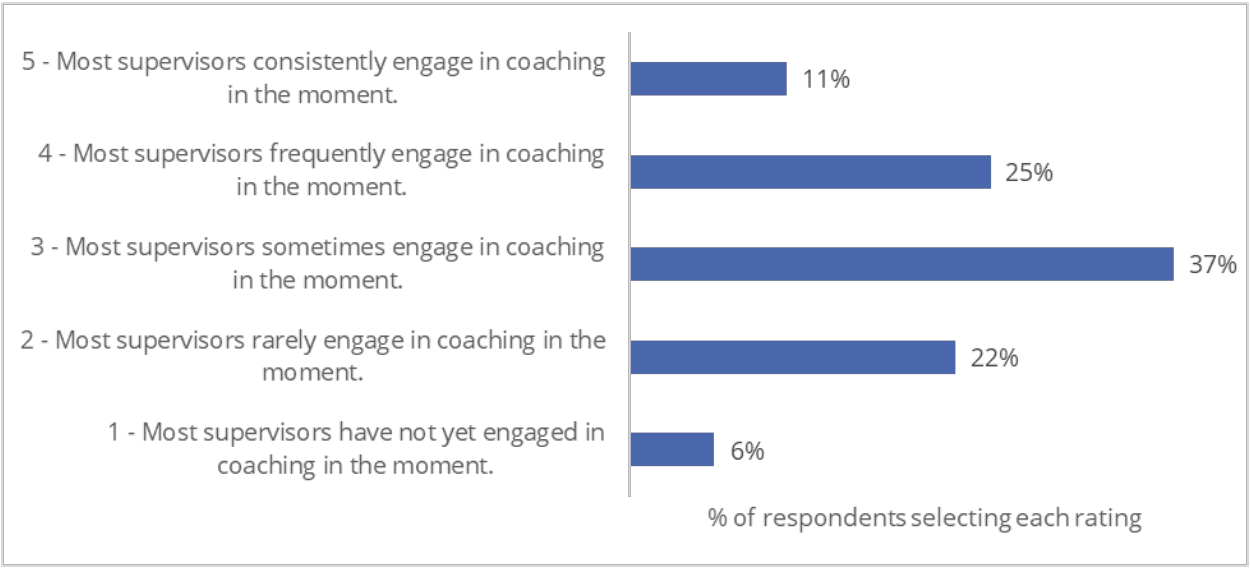


The institutions were sorted in descending order by the % of respondents who selected the last two options on the implementation scale. The institutions at the top of the graph had a greater percentage of respondents who experienced being further along in implementing the key component compared to those at the bottom of the graph.

Coaching in the Moment

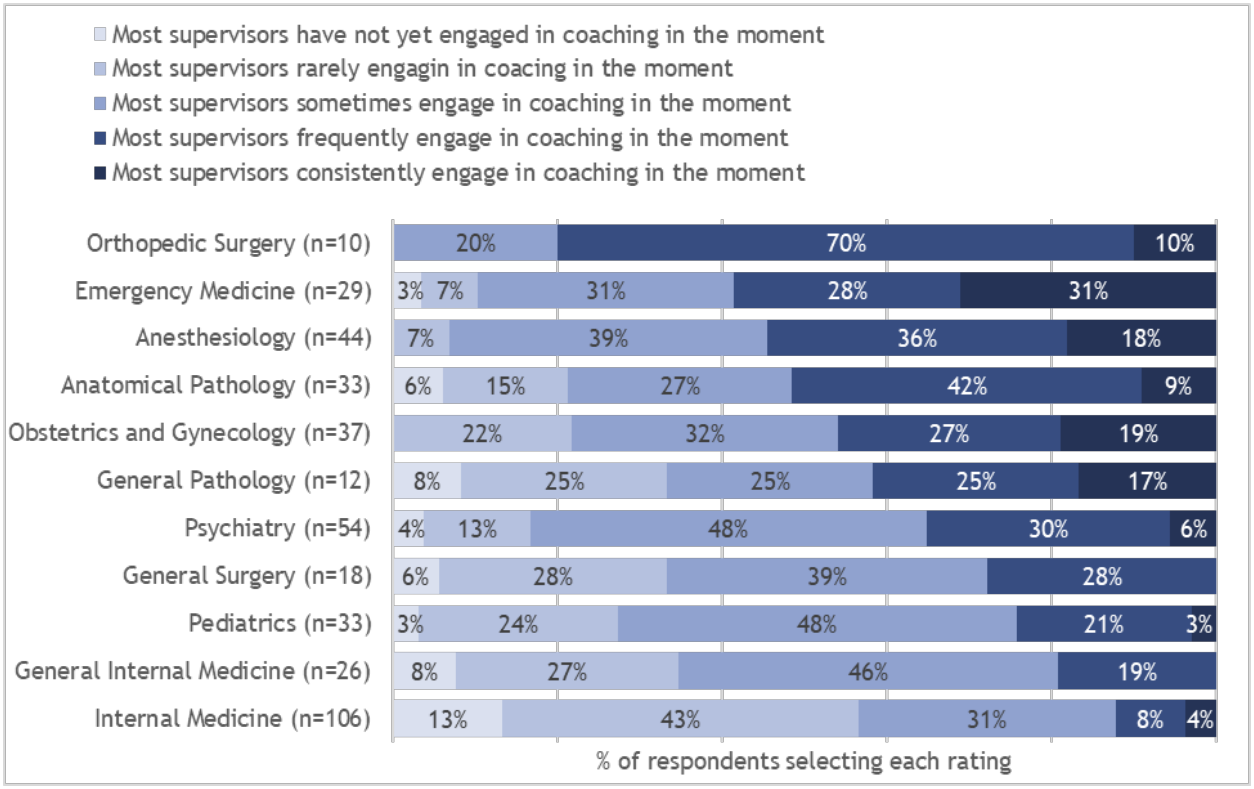
In CBD, all supervisors are encouraged to act as coaches in the clinical environment. Supervisors should provide resident physicians with specific and actionable feedback based on observation that is meant to guide them through a growth process resulting in performance enhancement. This "coaching in the moment" should occur as part of daily work and over the course of a learning experience (Royal College of Physicians and Surgeons of Canada, 2018).

Figure 5A: Overall Coaching in the Moment – Level of Implementation



n=506

Figure 5B: Coaching in the Moment – Level of Implementation by discipline:



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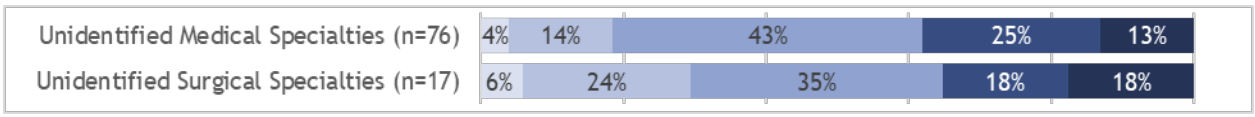

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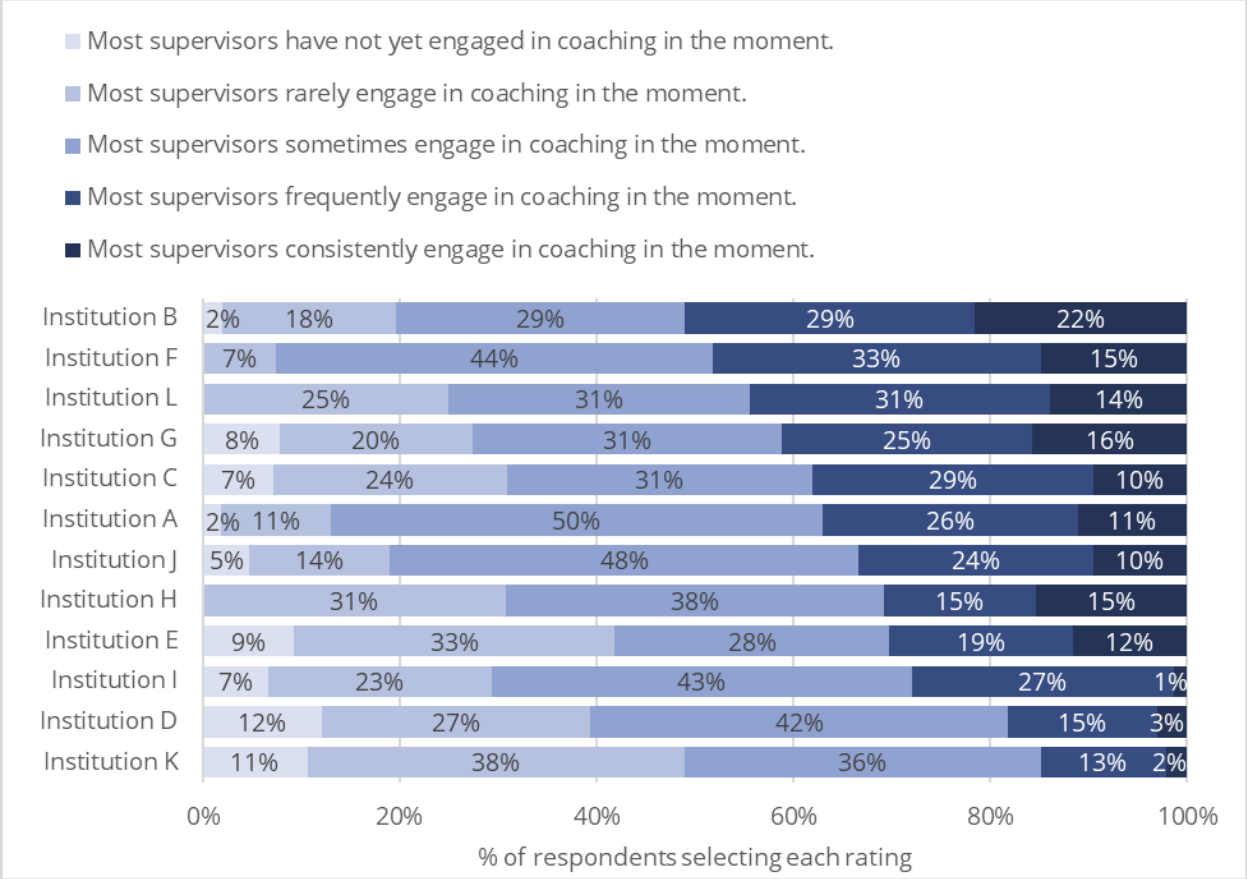
Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Nephrology (Pediatric), Neurology (Pediatric), Pediatric Surgery, Respirology (Pediatric), Rheumatology (Pediatric), Vascular Surgery

Figure 5C: Coaching in the Moment – Level of Implementation by institution:



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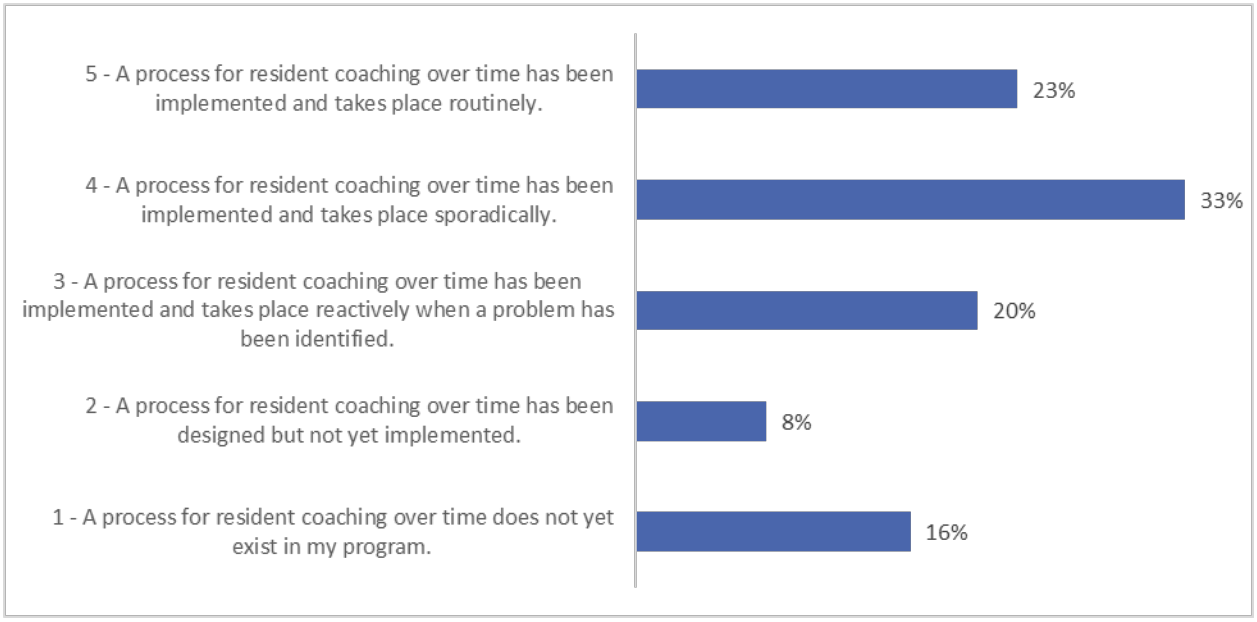
Coaching Over Time

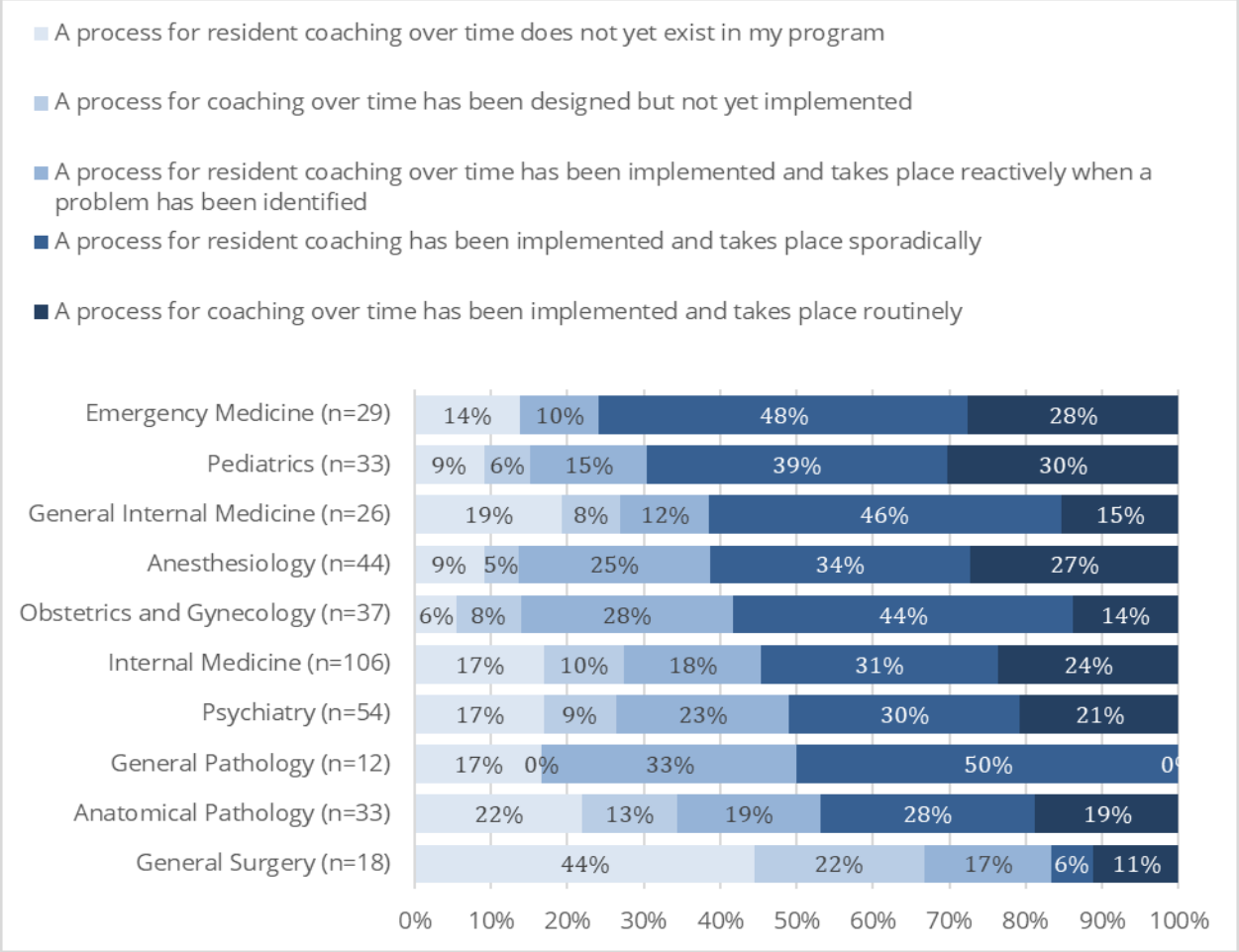
In CBD programs some faculty are designated to act as "coaches over time". This longitudinal process involves the regular review of, and reflection on learning portfolio data between a resident and designated faculty member to guide development towards competence, individualized learning goals and self-regulated lifelong learning skills (Royal College of Physicians and Surgeons of Canada, 2018).

Figure 6A: Coaching Over Time – Level of Implementation



n=501

Figure 6B: Coaching Over Time – Level of Implementation by discipline :



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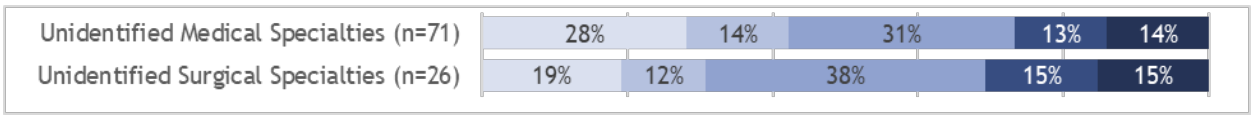

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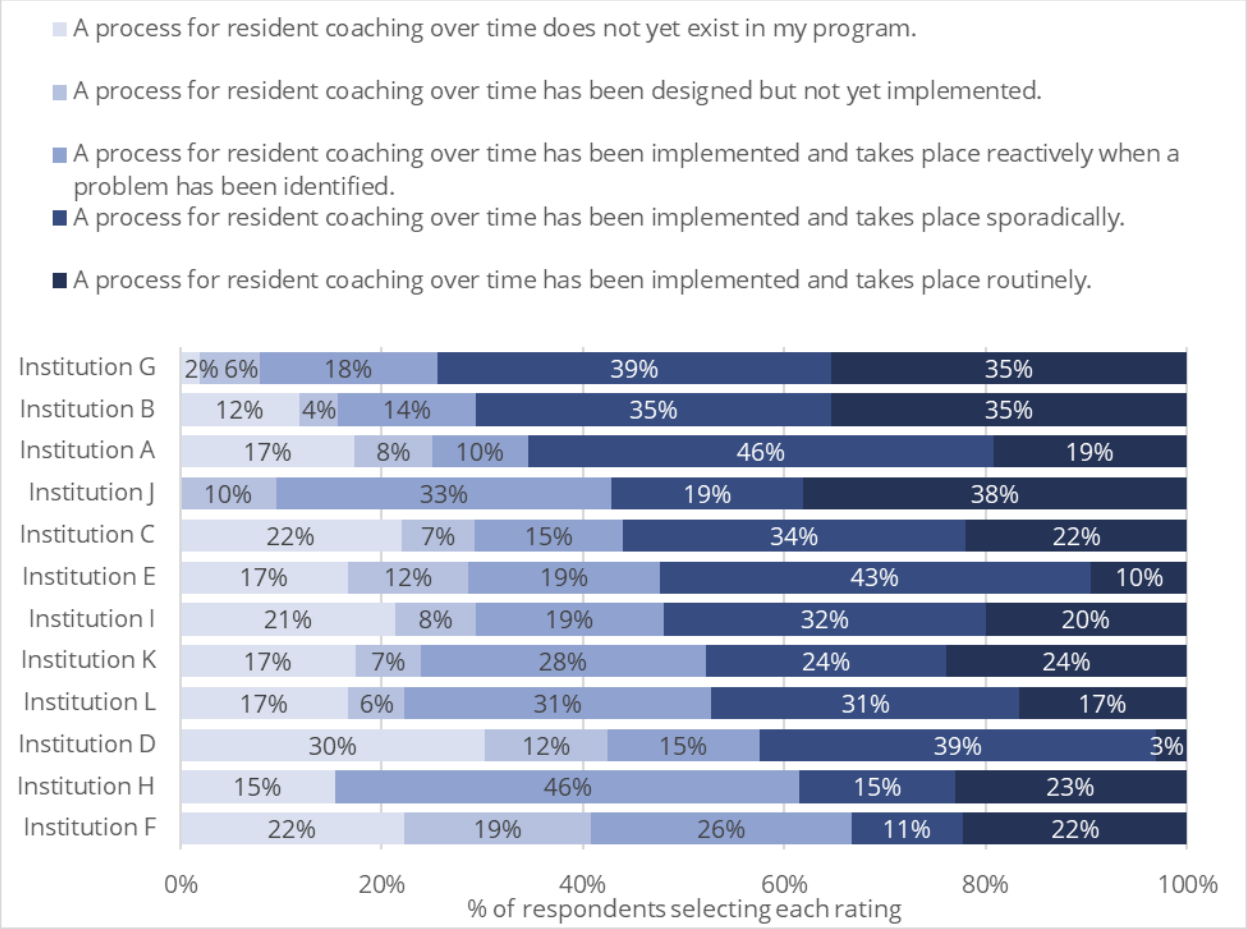
Figure 6C: Coaching Over Time – Level of Implementation by institution:



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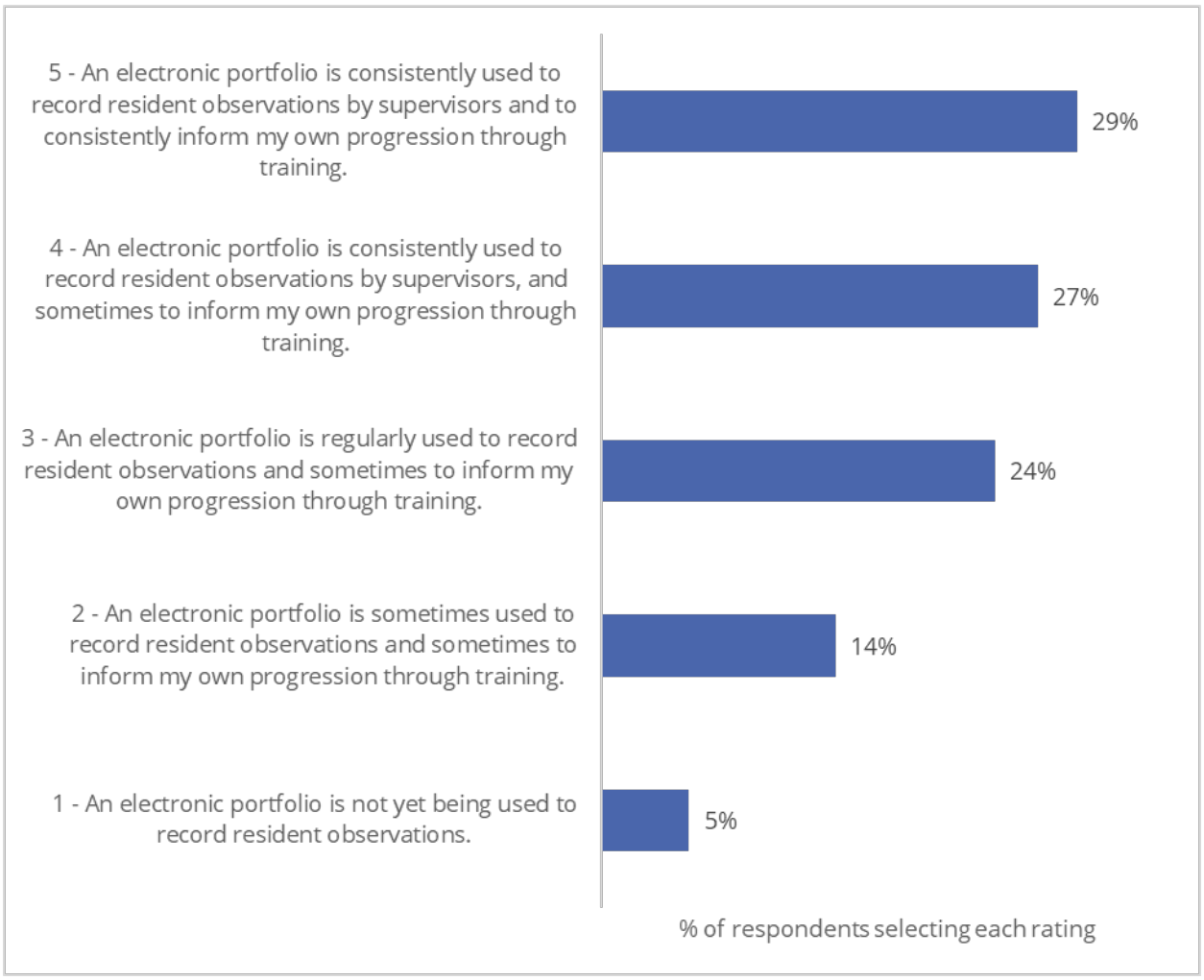
Electronic Portfolio

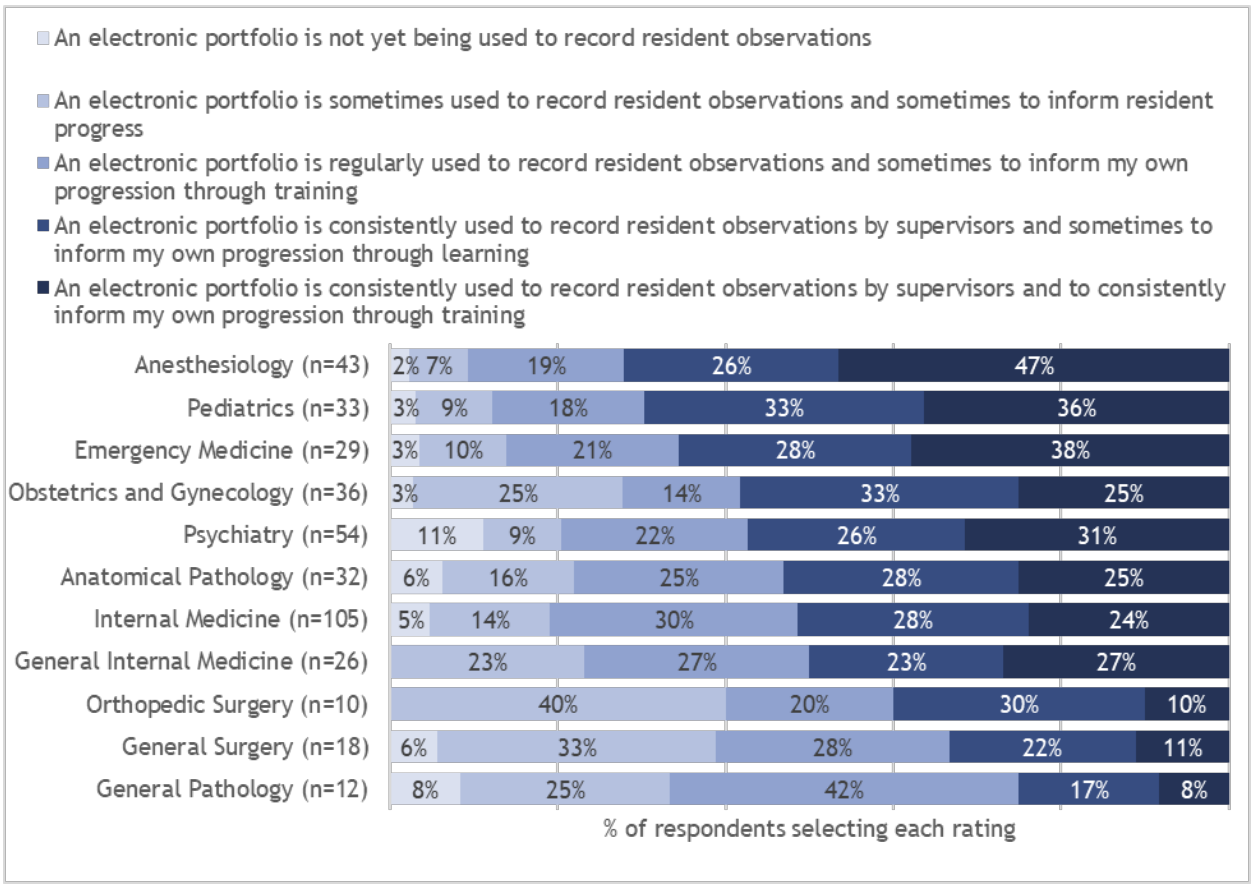
Electronic Portfolio – An electronic portfolio is a learning tool in CBD that allows for the electronic capture of observations, archiving of resident learning data, production of analytics and reports, and assessment of resident physician progression by competence committees (RCPSC, 2019b).

Figure 7A: Electronic Portfolio – Level of Implementation:



n=500

Figure 7B: Electronic Portfolio – Level of Implementation by discipline:



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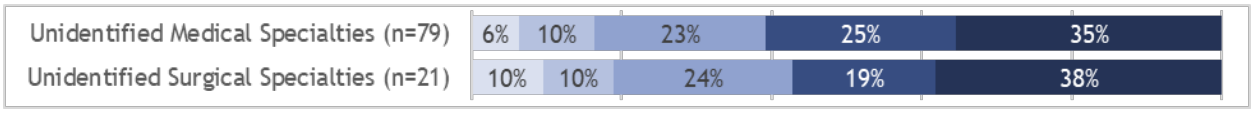

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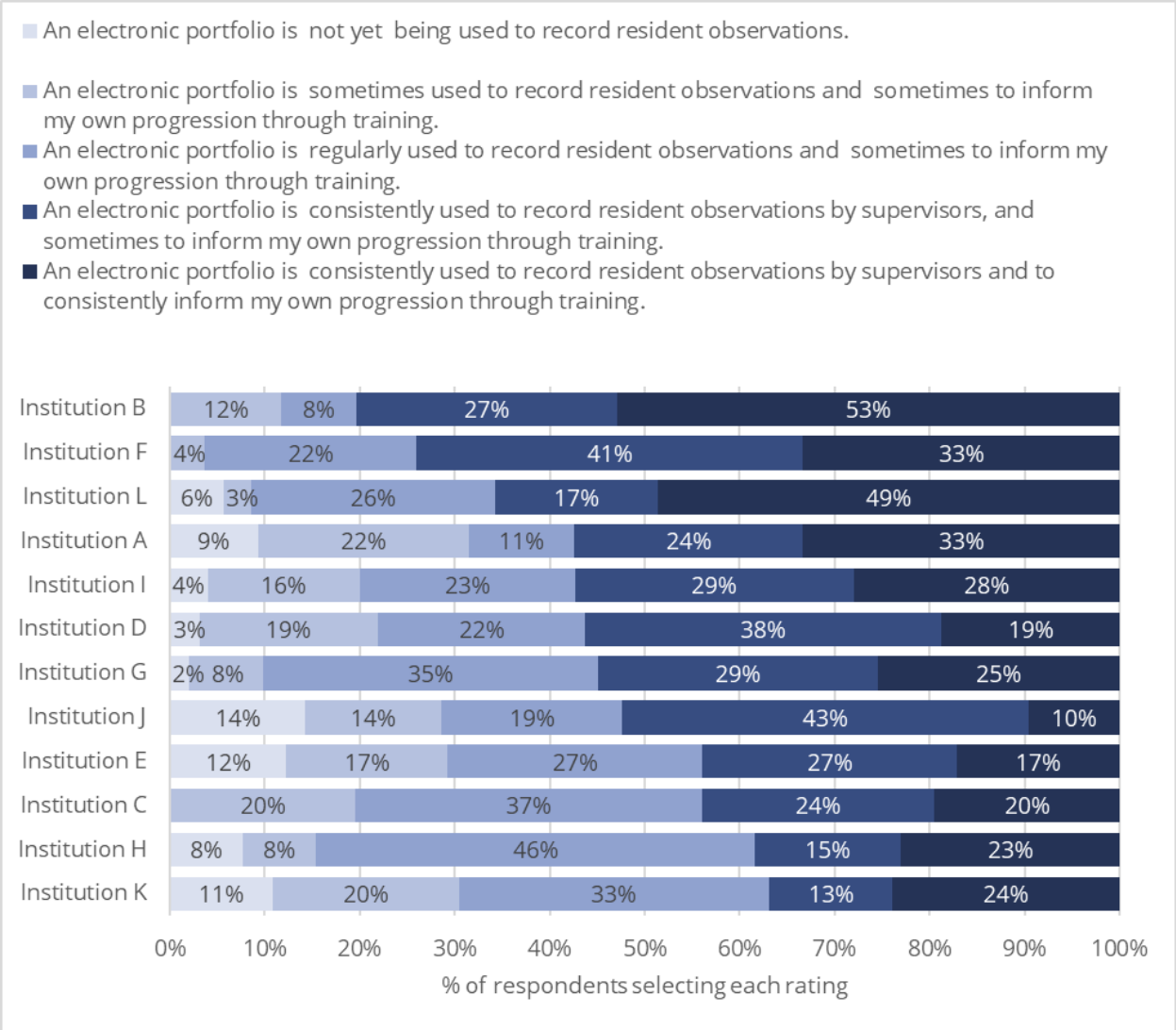
Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Nephrology (Pediatric), Neurology (Pediatric), Pediatric Surgery, Respirology (Pediatric), Rheumatology (Pediatric)

Figure 7C: Electronic Portfolio – Level of Implementation by institution:



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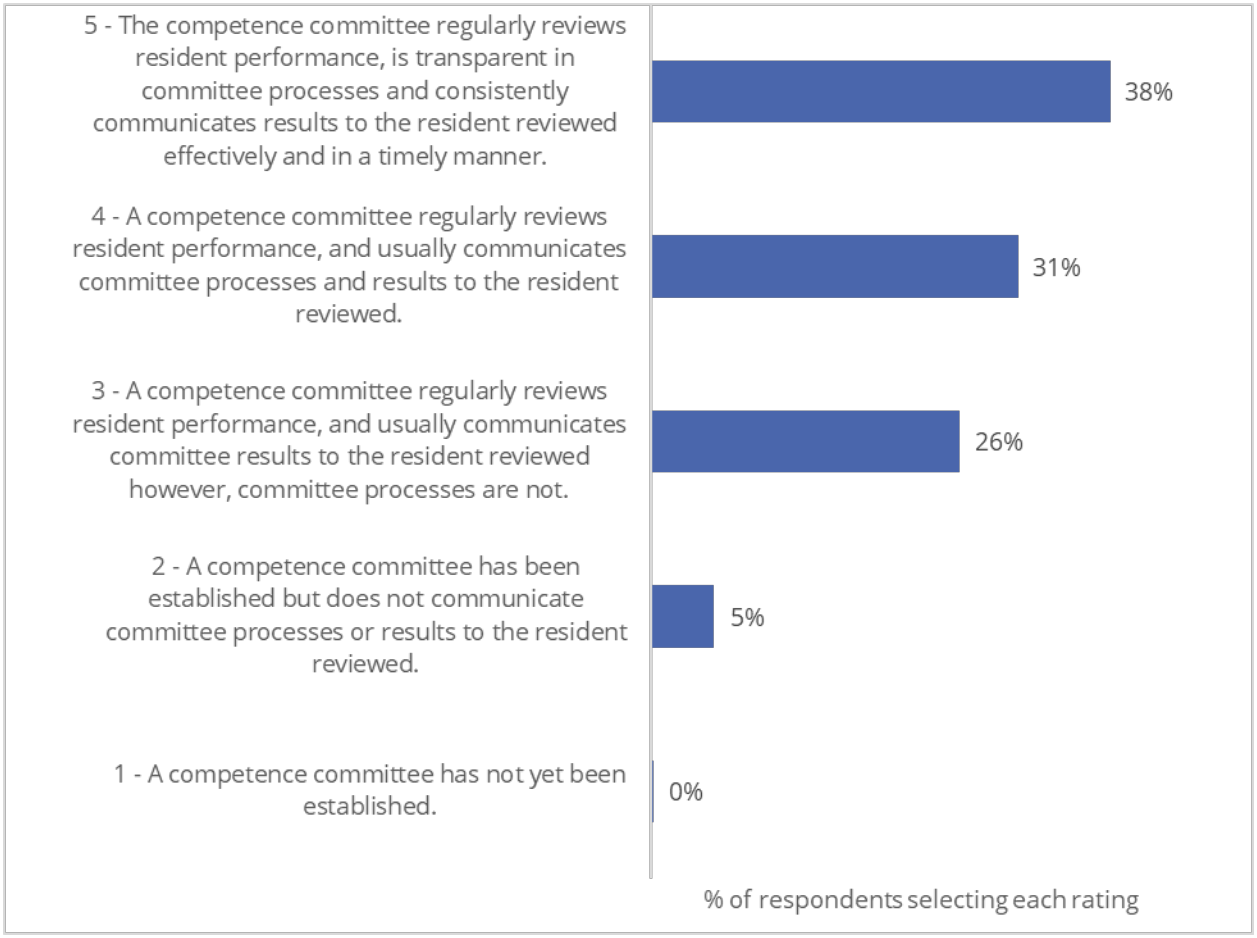
Competence Committee

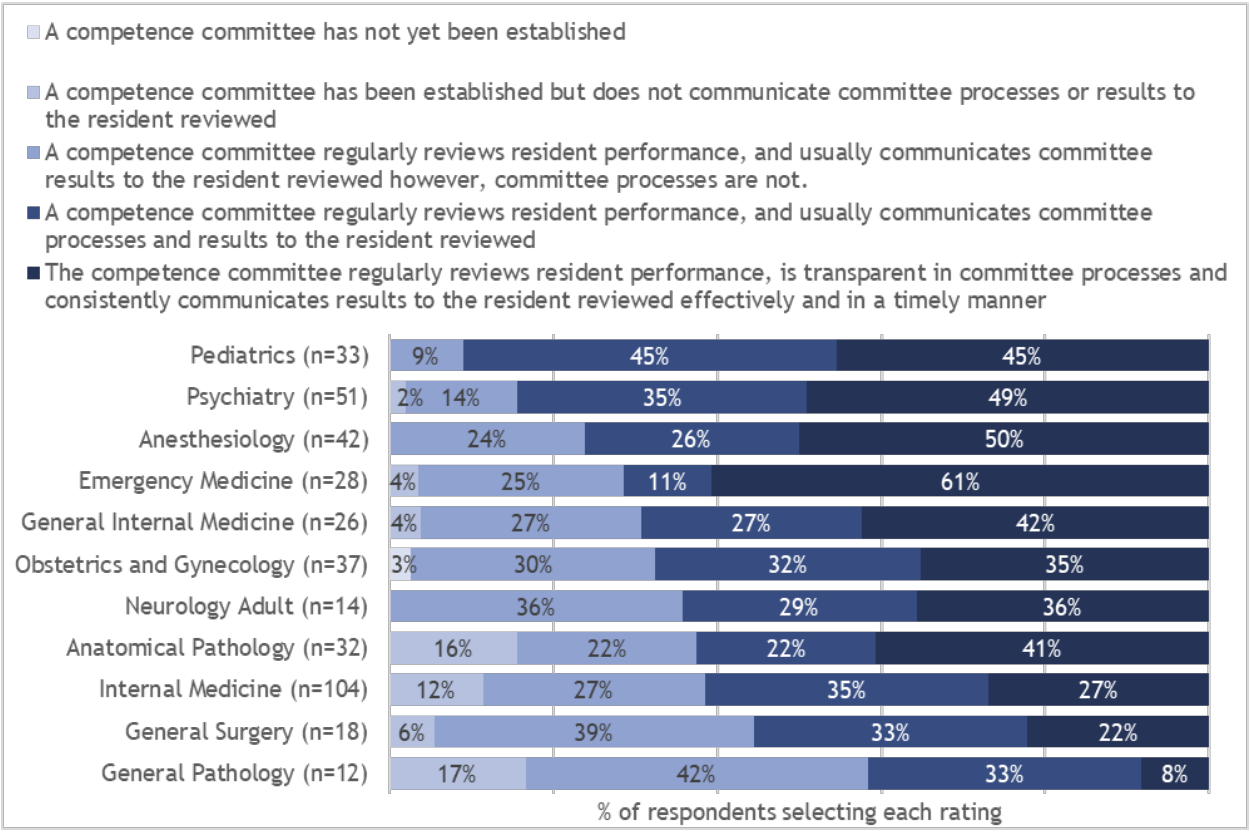
Competence Committee – Competence committees synthesize and appraise qualitative and quantitative data from multiple documented observations to reveal the broad picture of a resident physician's progression toward competence. The committee's processes must be transparent, and outcome decisions made by the committee must be shared with the resident undergoing review in a clear and timely manner (RCPSC, 2019a).

Figure 8A: Competence Committee – Level of Implementation



n=494

Figure 8B: Competence Committee – Level of Implementation by discipline:



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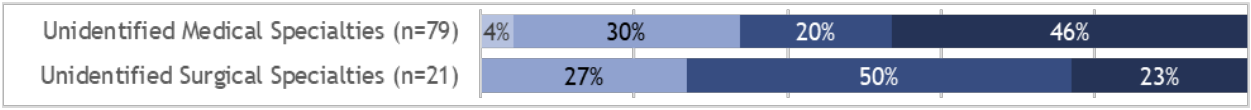

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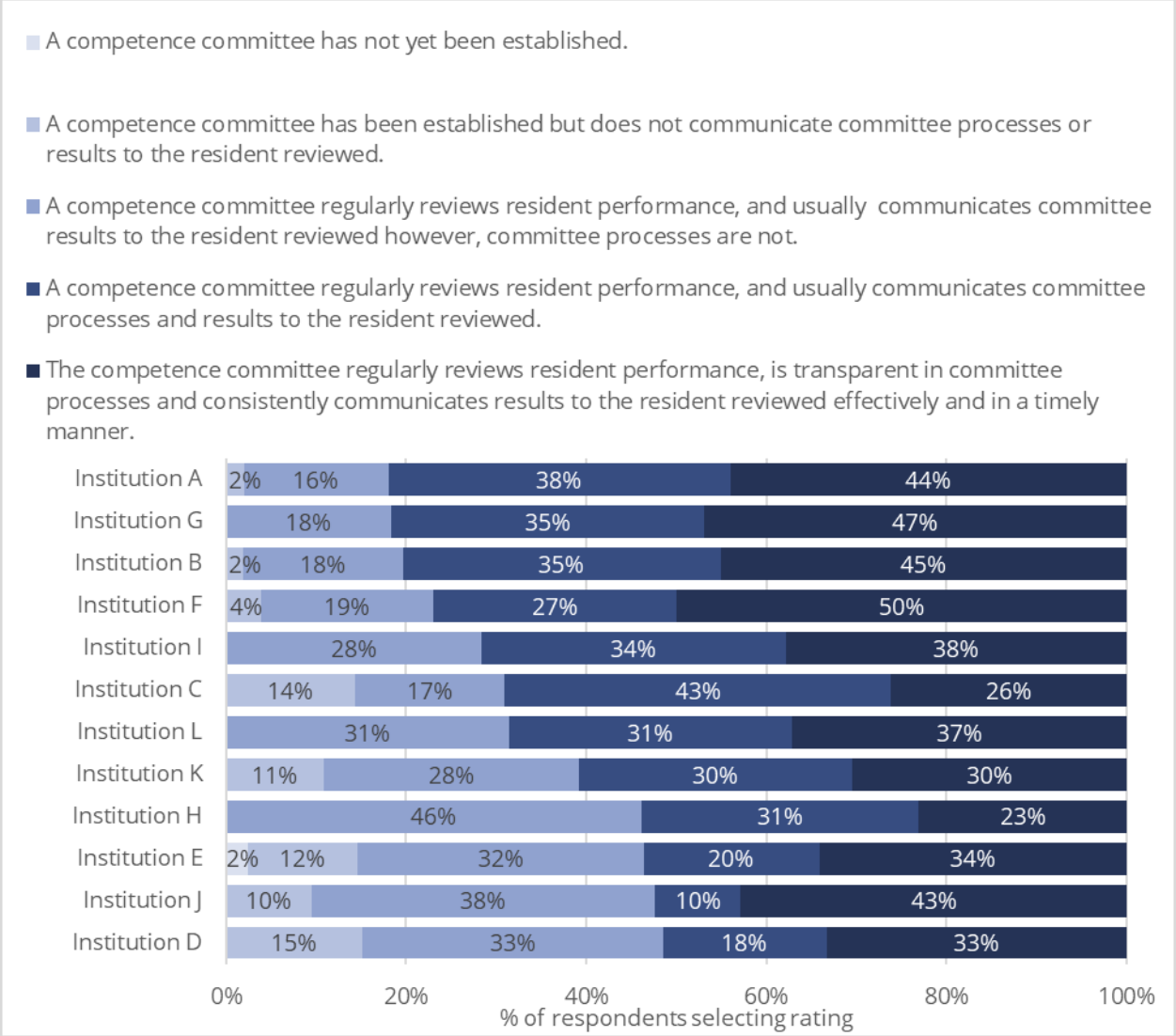
Figure 8B : Competence Committee – Level of Implementation by institution :



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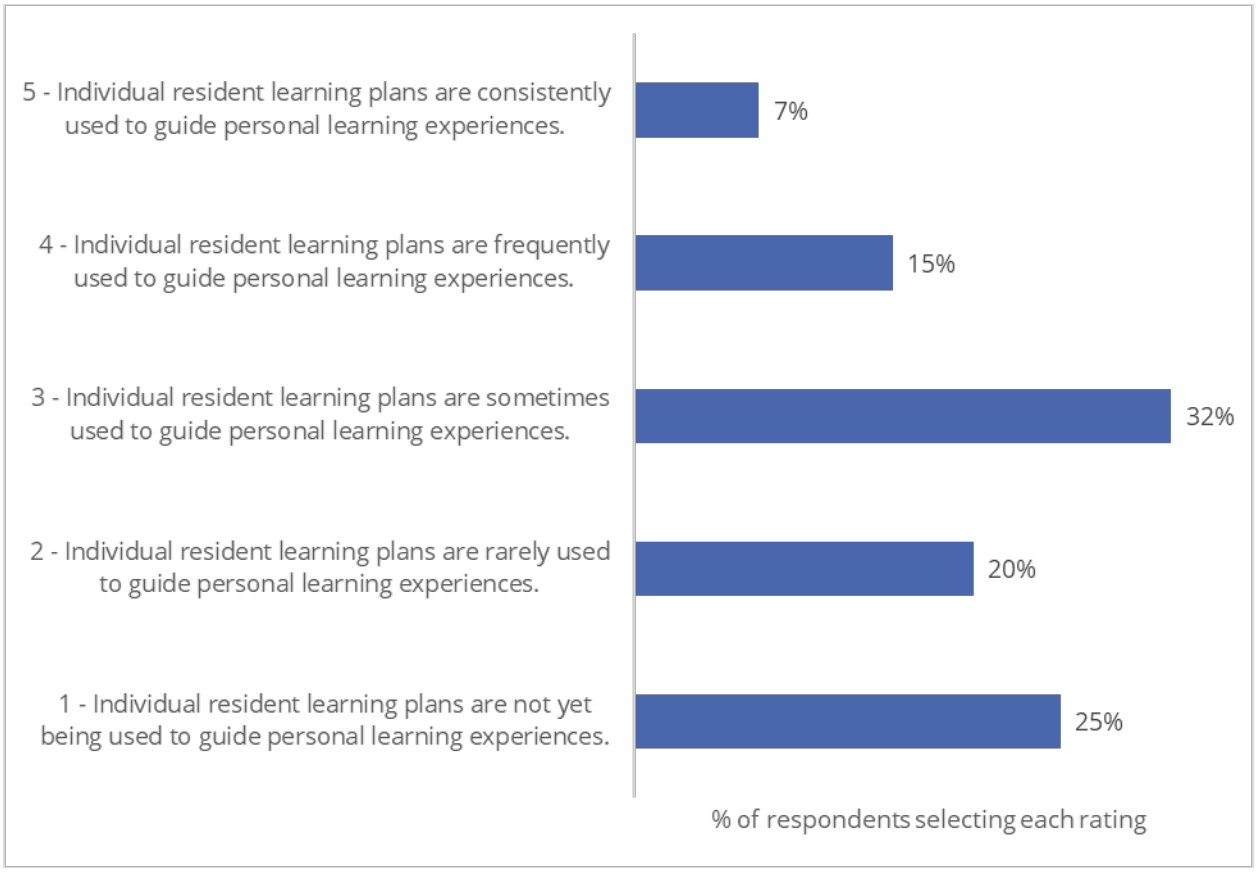
Individualized Resident Physician Stage-Based Learning Plans

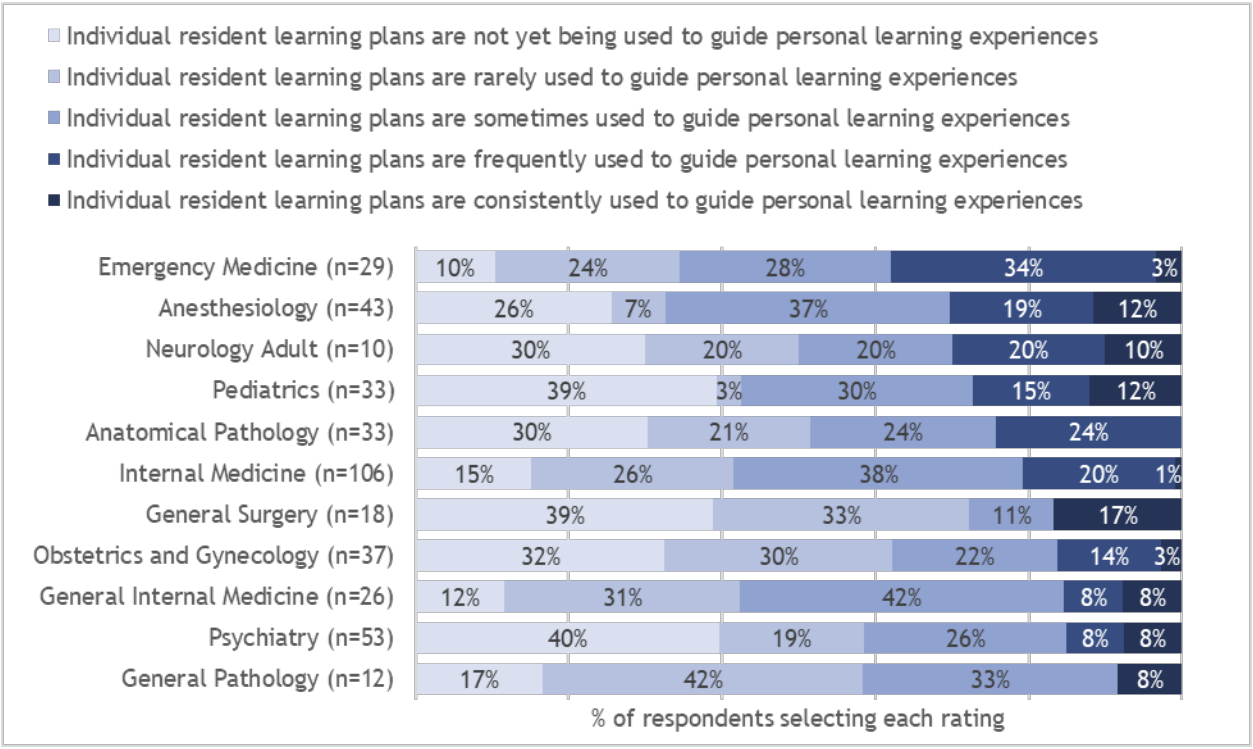
Individualized Resident Physician Stage-Based Learning Plans – CBME encourages a developmental approach that recognizes that all residents can benefit from documented individualized learning plans and stage-specific supports. These may include special mentors, readings, or modified rotations to maximize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

Figure 9A : Individual Resident Learning Plans – Level of Implementation



n=502

Figure 9B : Individual Resident Learning Plans – Level of Implementation by discipline :



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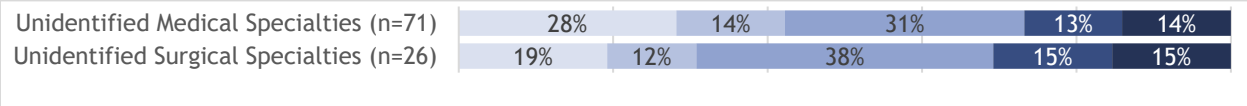

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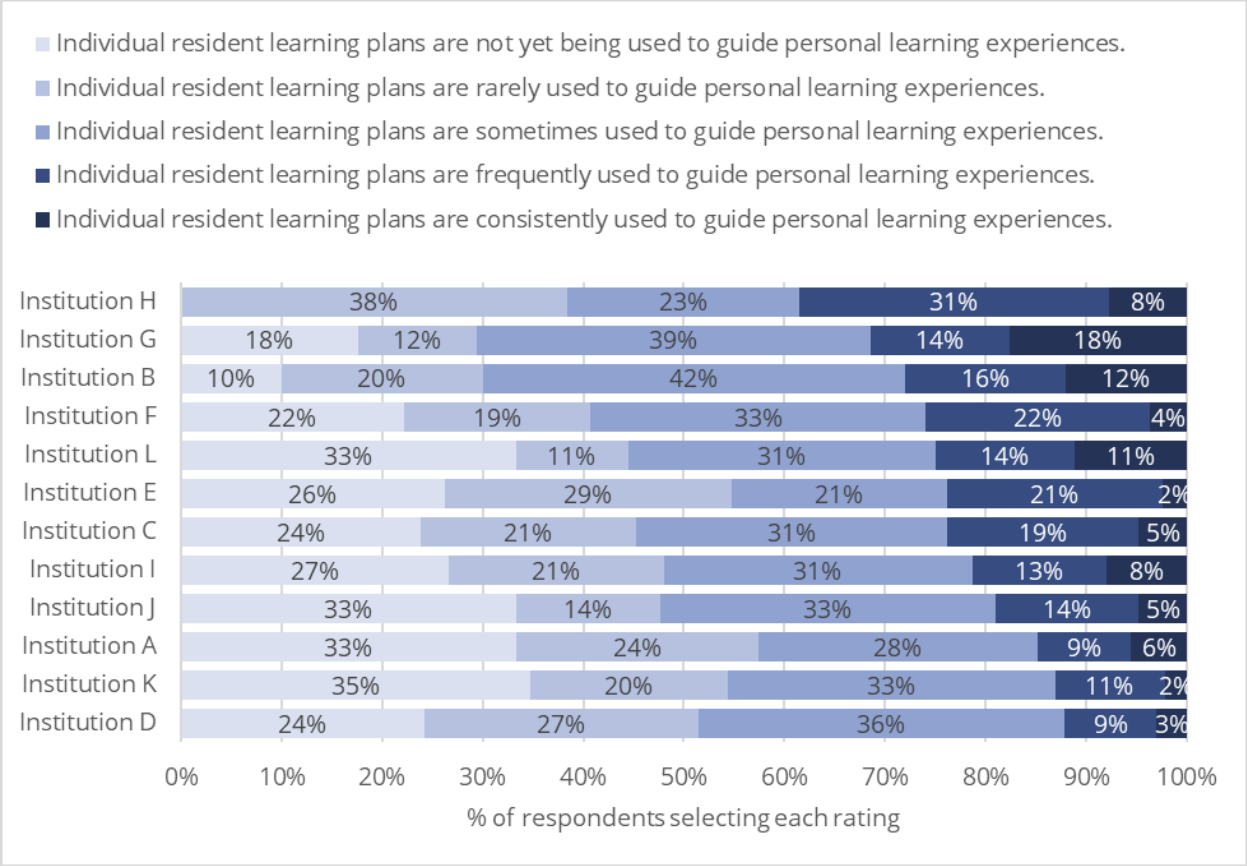
Disciplines without responses: Forensic Pathology, Forensic Psychiatry, Critical Care (Pediatric), Neurology (Pediatric), Pediatric Surgery, Respirology (Pediatric), Rheumatology (Pediatric)

Figure 9C: Individual Resident Learning Plans – Level of Implementation by institution:



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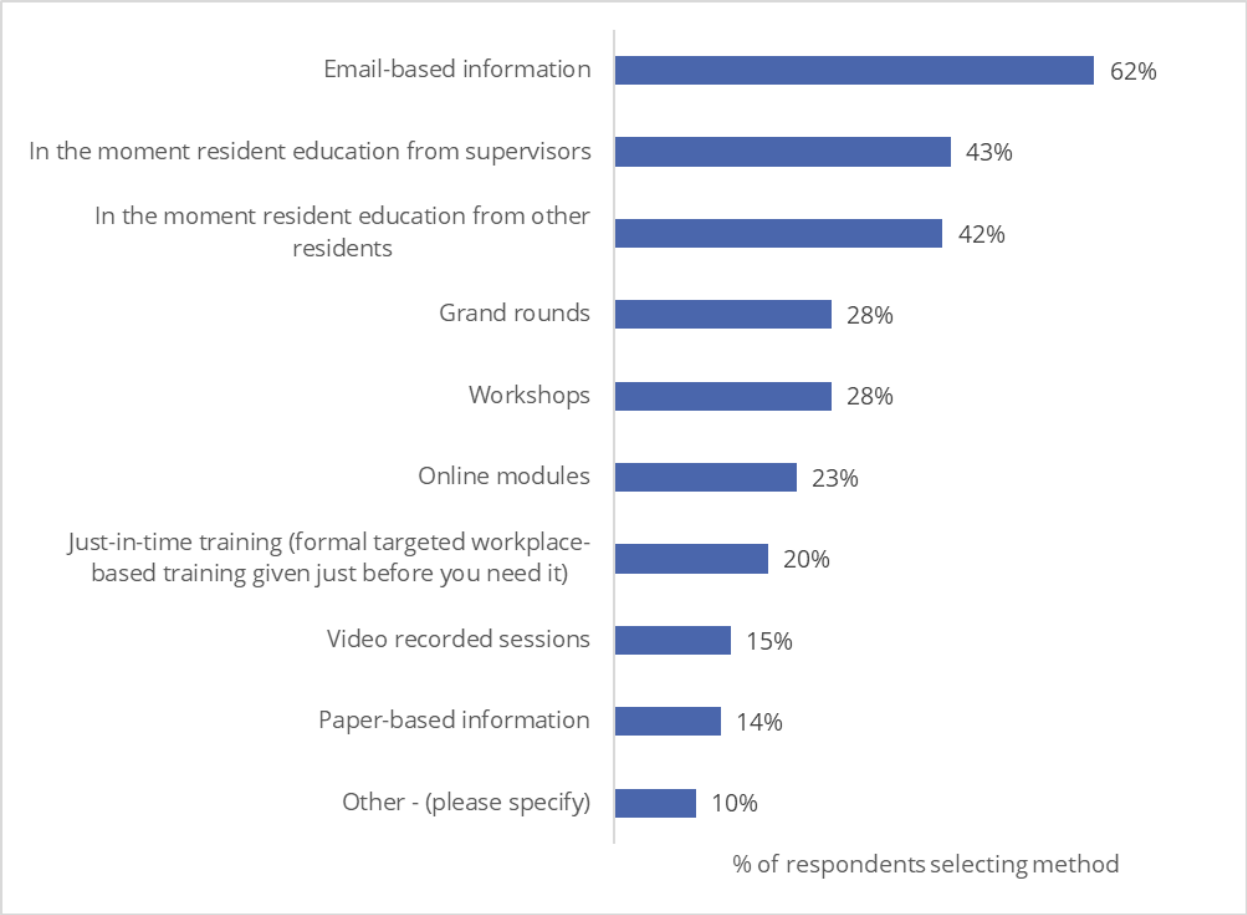
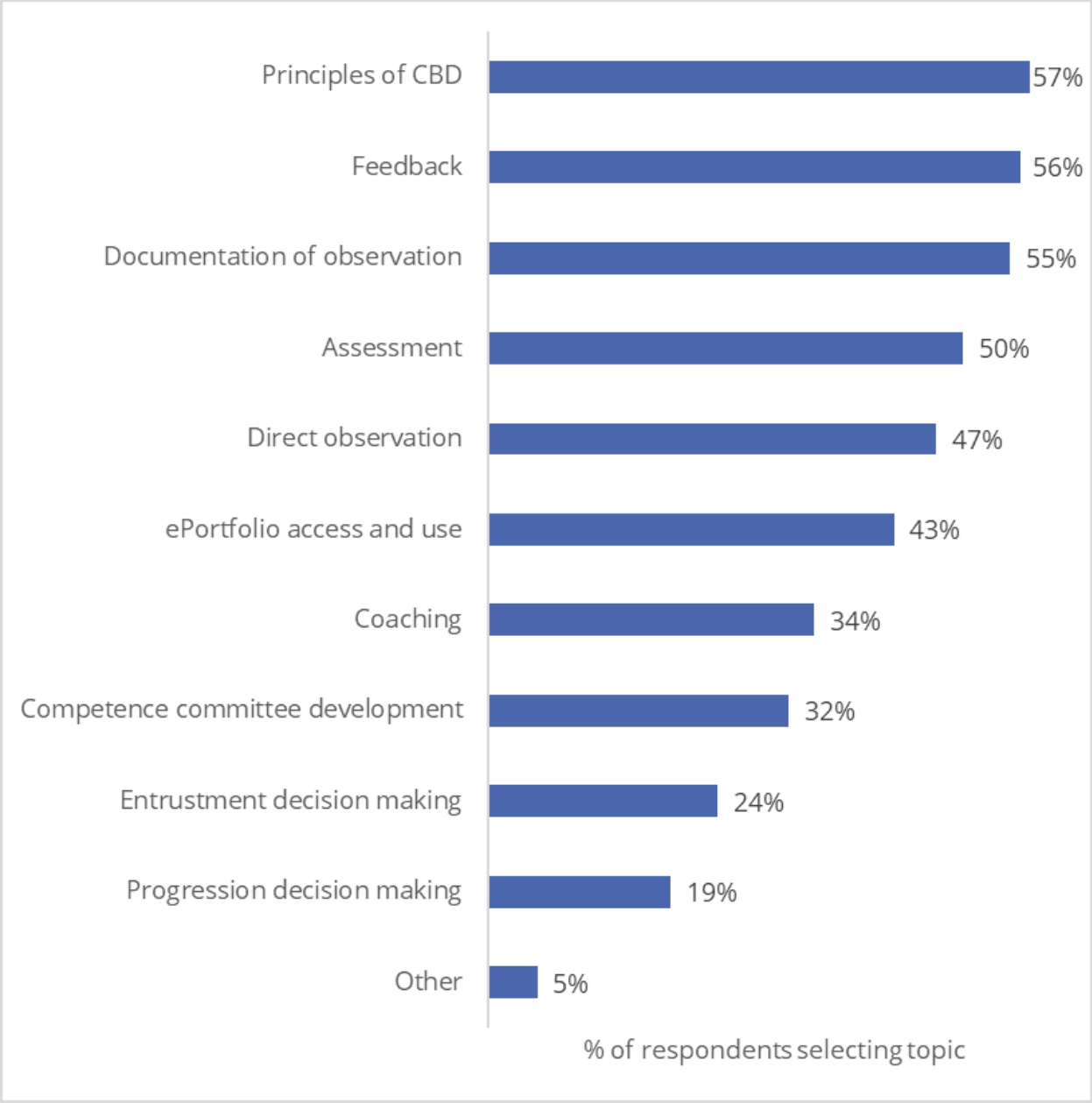
Resident Physician Education on CBD

Figure 10 - Methods used to deliver CBD training to residents in the last 12 months



n=502

Figure 11 - Topics of CBD training delivered to residents in the last 12 months



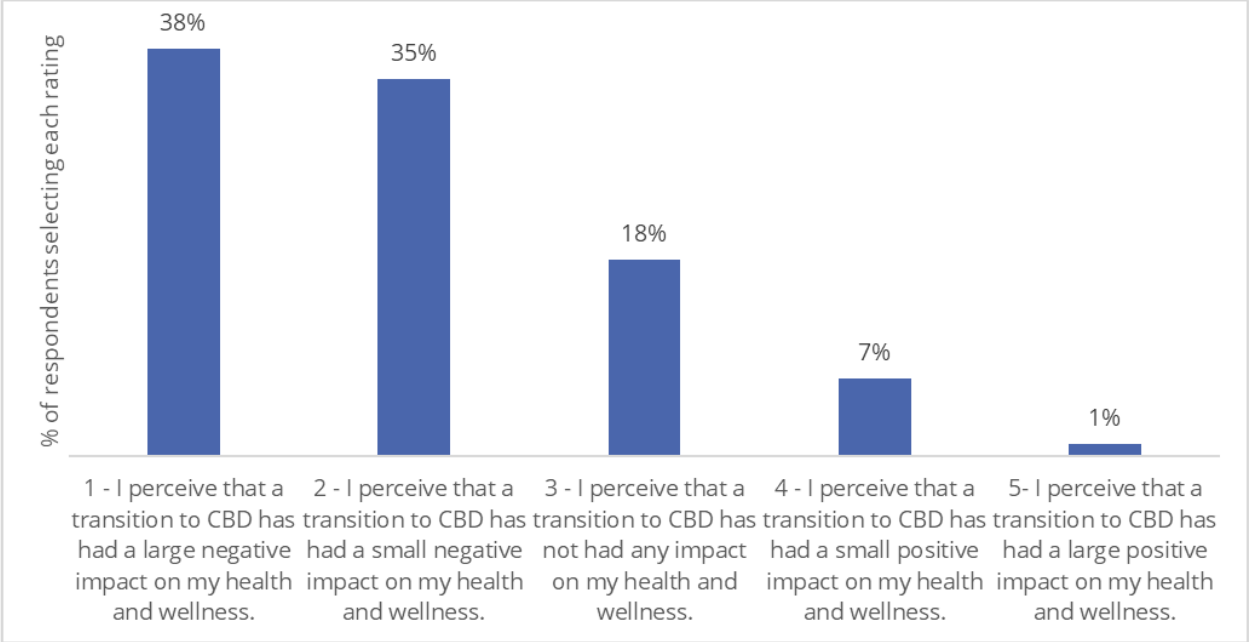
n=502

Resident Wellness

Residency training can be a particularly challenging time during a physician's career and has the potential to affect resident wellness. Recognizing that there are different ways of defining wellness, in this case we refer to it as the complex nature of resident physical, mental, and emotional health and well-being (Wallace, Lemaire, & Ghali, 2009).

Survey respondents were asked to rate how CBD has impacted their health and wellness on a 5-point scale, from strong negative impact to a strong positive impact. Figure 12 shows the distribution of ratings.

Figure 12A – Impact of the transition to CBD on health and wellness



n=507

Figure 12B – Impact of the transition to CBD on health and wellness

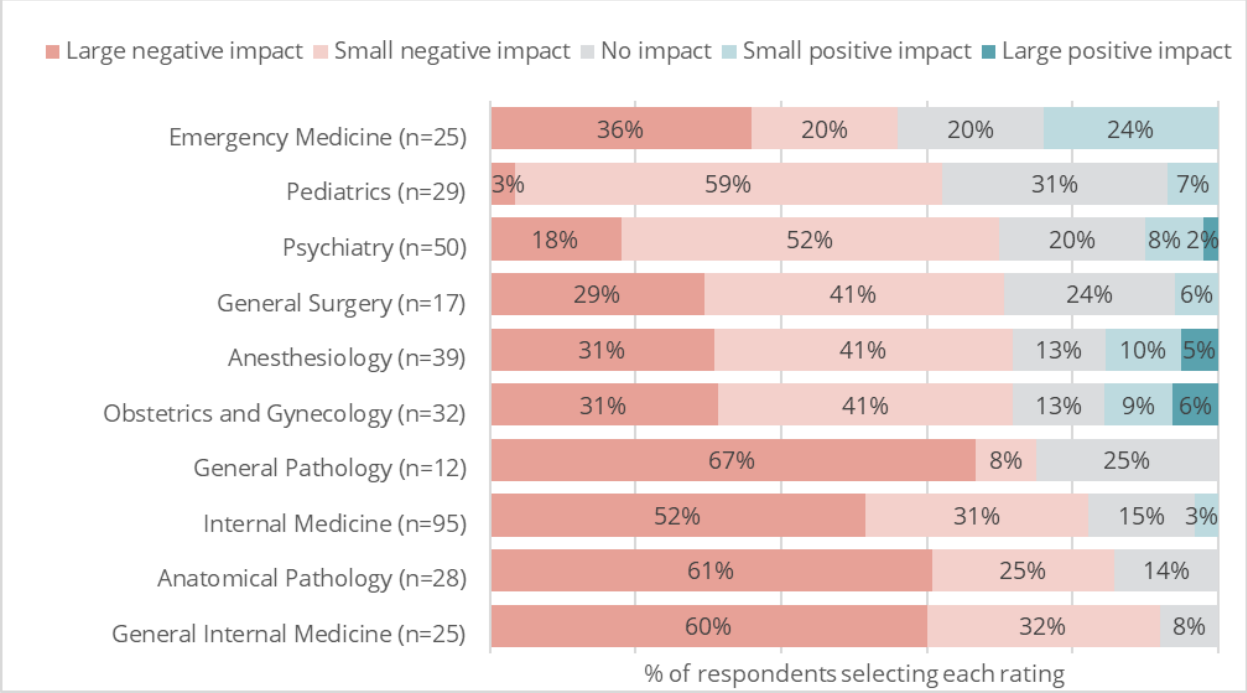
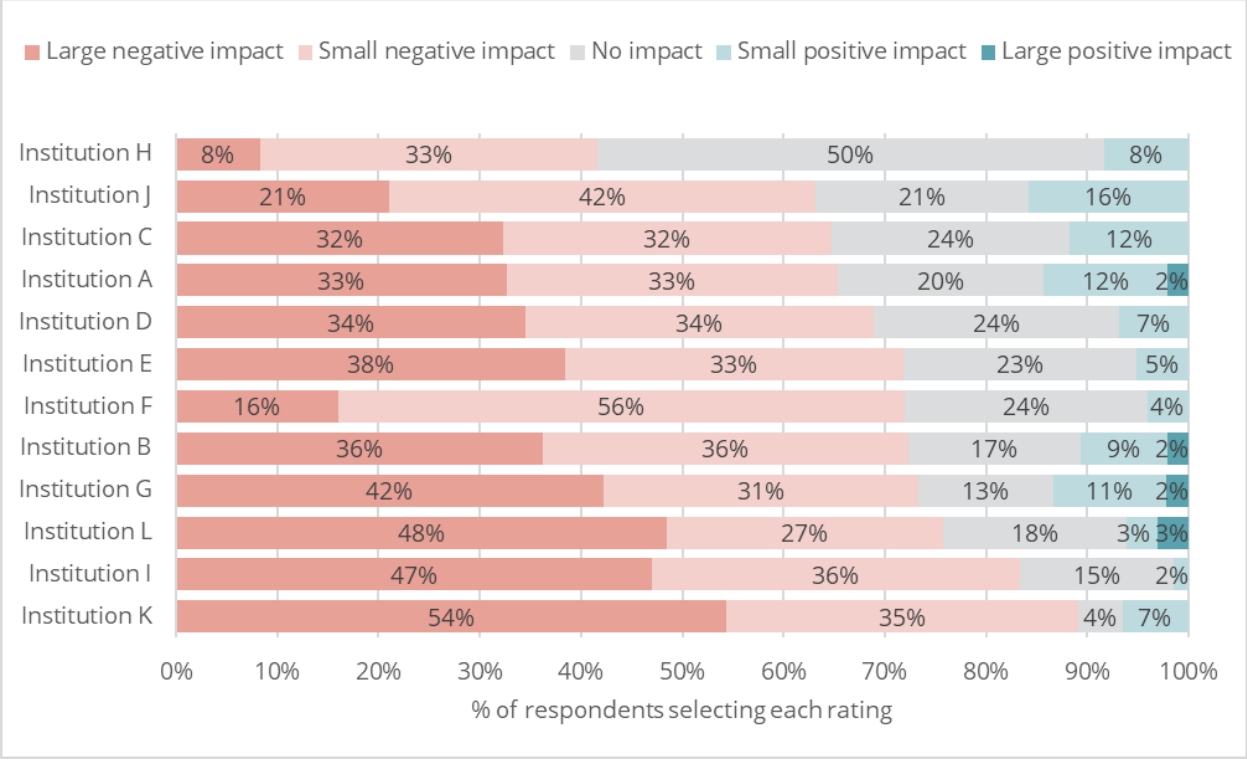


Figure 12C – Impact of the transition to CBD on health and wellness by institution



Challenges, Benefits, and Impact on Health and Wellness

Residents were asked to comment on the challenges and benefits they have encountered in CBD implementation and indicate what aspects of CBD have had the greatest negative and greatest positive impact on their health and wellness. The tables below present the main themes derived from the comments provided by the residents.

Table 4A – Challenges encountered with CBD implementation

Challenges encountered with CBD implementation	
Theme	**Sub-theme**
EPA completion by faculty (61%)	• Lack of timely completion • Saying they will do it, but then don't • Unwillingness, refusal to participate
Concerns around value/utility (22%)	• A check-box exercise • Extra work with little to no added benefit
Lack of opportunities to complete EPAs (21%)	• Some EPA scenarios are rarely encountered • Limited opportunities for direct observation • Unrealistic numbers • Strict/specific criteria
Administrative Workload (18%)	• Amount of 'paperwork', documentation • Very time-consuming
Feedback inadequacies (17%)	• Lack of in-the-moment, timely feedback • Lack of meaningful feedback
Onus primarily on residents (15%)	• To initiate EPAs, to chase down busy faculty • To keep track of EPAs and specific criteria • Being held accountable for incomplete EPAs, despite best efforts to complete them
Technological challenges (13%)	• Lack of a smooth, well functioning platform • Difficulty navigating platform • Challenges with access
Inconsistencies in EPA interpretation, scoring (13%)	• Lack of agreement on what is required for a successful EPA • Understanding the difference between 4 and 5

Table 4B - Challenges encountered with CBD implementation by discipline

	Overall	Anatomical Pathology	Anesthesiology	Emergency Medicine	General Internal Medicine	General Pathology	General Surgery	Internal Medicine	Obstetrics and Gynecology	Pediatrics	Psychiatry	Unidentified **Medical** Disciplines	Unidentified **Surgical** Disciplines
Total number of responses	395	27	31	22	23	12	16	76	31	28	42	66	21
Challenges with EPA completion by faculty	61%	52%	38%	41%	48%	50%	69%	51%	42%	39%	43%	32%	67%
Lack of opportunities to perform EPAs	21%	41%	6%	23%	22%	50%	0%	19%	26%	43%	5%	21%	19%
Concerns around value/utility	22%	22%	31%	32%	39%	0%	44%	19%	26%	7%	24%	17%	5%
Onus primarily on residents	15%	15%	6%	0%	13%	17%	19%	18%	13%	11%	10%	21%	24%
Technological challenges	13%	7%	16%	0%	4%	17%	19%	14%	10%	11%	14%	18%	14%
Feedback Inadequacies	17%	11%	3%	32%	26%	8%	19%	18%	16%	21%	14%	18%	19%
Administrative burden	18%	26%	31%	14%	30%	8%	44%	21%	10%	4%	7%	17%	10%
Unfamiliarity with CBD/EPAs	11%	19%	3%	14%	4%	8%	6%	9%	10%	14%	19%	12%	10%
Inconsistencies in EPA interpretation/scoring	13%	26%	16%	14%	9%	17%	13%	11%	19%	11%	7%	14%	5%
Opportunity costs (takes time/focus away from other things)	5%	11%	3%	14%	4%	8%	0%	4%	0%	4%	2%	6%	0%
Lack of transparency	3%	0%	6%	0%	9%	0%	0%	5%	3%	4%	2%	2%	0%

Table 4C - Challenges encountered with CBD implementation by institution

	Institution A	Institution B	Institution C	Institution D	Institution E	Institution F	Institution G	Institution I	Institution J	Institution K	Institution L
Total number of responses	-	-	-	-	-	-	-	-	-	-	-
Challenges with EPA completion by faculty	64%	55%	91%	70%	58%	79%	60%	39%	85%	61%	50%
Lack of opportunities to perform EPAs	33%	10%	27%	0%	8%	13%	10%	13%	9%	12%	30%
Concerns around value/utility	26%	17%	33%	44%	4%	16%	25%	34%	11%	44%	40%
Onus primarily on residents	21%	26%	3%	15%	0%	8%	5%	24%	2%	10%	25%
Technological challenges	5%	21%	21%	19%	27%	11%	5%	8%	9%	15%	10%
Feedback Inadequacies	21%	26%	9%	41%	42%	18%	30%	29%	4%	22%	75%
Administrative burden	21%	43%	15%	37%	15%	26%	20%	37%	6%	34%	20%
Unfamiliarity with CBD/EPAs	0%	0%	33%	19%	31%	29%	20%	16%	2%	7%	5%
Inconsistencies in EPA interpretation/scoring	36%	17%	27%	15%	23%	37%	0%	18%	9%	12%	15%
Opportunity costs (takes time/focus away from other things)	7%	0%	0%	0%	12%	11%	10%	5%	0%	15%	5%
Lack of transparency	5%	0%	3%	11%	8%	11%	0%	0%	2%	2%	10%

The number of responses by institution is not provided in this table to avoid identifying institutions. Data from institutions with fewer than 10 responses are not presented.

Table 5A - Benefits encountered with CBD implementation

Benefits encountered with CBD implementation	
Theme	**Sub-theme**
Feedback (20%)	• Frequent feedback • Targeted feedback that informs learning • Timely, in-the-moment feedback
Structured learning/ clear expectations (15%)	• Clarity around learning objectives and requirements • Defined, focused learning path
Tracking/documenting progress (15%)	• Documentation of completed procedures and experiences • Identification of gaps • Reflection on progress
Staff engagement in learning (7%)	• Easier to approach staff for EPAs and feedback • Some staff initiate opportunities for EPAs • Benefit of having a coach/mentor
Flexibility (2%)	• Can tailor rotations around learning objectives • Reduced off service rotations • Flexibility to arrange learning around personal leaves
Sense of accomplishment/ confidence (2%)	• Sense of accomplishment when completing a task successfully • Confidence in competencies

Table 5B - Benefits encountered with CBD implementation by discipline:

	Overall	Anatomical Pathology	Anesthesiology	Emergency Medicine	General Internal Medicine	General Pathology	General Surgery	Internal Medicine	Obstetrics and Gynecology	Pediatrics	Psychiatry	Unidentified **Medical** Disciplines	Unidentified **Surgical** Disciplines
Total number of responses	327	24	22	19	23	11	11	69	16	21	33	57	21
Structured learning	15%	13%	14%	21%	22%	36%	9%	13%	13%	14%	3%	16%	19%
Monitor progress through EPAs	15%	21%	18%	16%	17%	9%	18%	12%	19%	14%	12%	18%	10%
Allows flexibility	2%	13%	5%	0%	0%	0%	0%	0%	0%	0%	3%	2%	0%
Engage staff in learning	7%	4%	5%	11%	13%	9%	9%	4%	13%	14%	3%	5%	5%
Receiving regular feedback	2%	0%	14%	0%	4%	0%	0%	1%	0%	0%	0%	2%	0%
Sense of accomplishment/confidence	2%	0%	14%	0%	4%	0%	0%	1%	0%	0%	0%	2%	0%
Experienced little to no benefit	57%	63%	45%	53%	70%	55%	73%	71%	56%	43%	42%	53%	52%

Table 5C - Benefits encountered with CBD implementation by institution :

	Institution A	Institution B	Institution C	Institution D	Institution E	Institution F	Institution G	Institution I	Institution J	Institution K	Institution L
Total number of responses	-	-	-	-	-	-	-	-	-	-	-
Structured learning	3%	6%	3%	10%	14%	6%	7%	3%	0%	6%	7%
Monitor progress through EPAs	3%	10%	6%	0%	5%	6%	7%	9%	2%	0%	10%
Allows flexibility	0%	0%	3%	0%	0%	0%	7%	6%	2%	6%	0%
Engage staff in learning	3%	10%	0%	0%	5%	0%	7%	3%	7%	0%	2%
Receiving regular feedback	20%	10%	19%	10%	9%	3%	7%	3%	7%	11%	0%
Sense of accomplishment/confidence	0%	0%	3%	0%	5%	0%	0%	6%	5%	6%	7%
Experienced little to no benefit	77%	58%	45%	76%	50%	62%	71%	75%	65%	56%	73%

The number of responses by institution is not provided in this table to avoid identifying institutions. Data from institutions with fewer than 10 responses are not presented.

Table 6A - Aspects of CBD having greatest negative impact on health and wellness

Aspects of CBD having greatest negative impact on health and wellness	
Theme	**Sub-theme**
Stress from chasing staff to do EPAs (32%)	• Stress/pressure of always having to chase staff to complete EPAs • Worried about "pestering", "nagging", "bothering", "burdening" staff to observe, fill-out, and/or sign-off on EPAs
Administrative burden (31%)	• "Excessive" paperwork/documentation and administrative effort • Strain on time • Something else to worry about in an already busy environment
Worried about achieving requirements (26%)	• Pressure of completing "enough" EPAs • Worried about not progressing to the next stage/graduating on time
Concerns around utility/validity (9%)	• check-box exercise/numbers game • Disconnect between EPA rating and other measures of performance
Cognitive load (9%)	• Constant need to evaluate if an encounter satisfies an EPA • Trying to remember all EPAs and their subcategories
Evaluation/Performance Anxiety (7%)	• Feelings of always being under scrutiny/evaluation • Worried about being compared to others
Preoccupation with EPAs (2%)	• Taking focus away from other learning opportunities • Thinking more about EPAs than patients

Table 6B - Aspects of CBD having greatest negative impact by discipline :

	Overall	Anatomical Pathology	Anesthesiology	Emergency Medicine	General Internal Medicine	General Pathology	General Surgery	Internal Medicine	Obstetrics and Gynecology	Pediatrics	Psychiatry	Unidentified **Medical** Disciplines	Unidentified **Surgical** Disciplines
Total number of responses	364	24	28	19	20	11	13	79	29	21	37	63	20
Stress from chasing staff to do EPAs	32%	21%	32%	16%	22%	27%	55%	30%	52%	25%	43%	35%	45%
Worried about achieving requirements	26%	46%	14%	42%	26%	36%	36%	16%	24%	35%	31%	37%	5%
Administrative burden	31%	33%	32%	21%	43%	55%	55%	30%	29%	25%	14%	33%	55%
Cognitive load	9%	4%	0%	11%	13%	0%	0%	11%	14%	20%	9%	10%	5%
Evaluation/performance anxiety	7%	4%	9%	5%	13%	9%	9%	6%	14%	15%	0%	10%	5%
Preoccupation with EPAs	2%	0%	0%	0%	0%	18%	9%	4%	0%	5%	3%	0%	0%
Concerns about utility/validity	9%	8%	5%	11%	0%	9%	0%	10%	19%	10%	11%	8%	20%

Table 6C - Aspects of CBD having greatest negative impact on health and wellness by institution :

	Institution A	Institution B	Institution C	Institution D	Institution E	Institution F	Institution G	Institution I	Institution J	Institution K	Institution L
Total number of responses	-	-	-	-	-	-	-	-	-	-	-
Administrative burden	33%	43%	38%	62%	45%	44%	47%	49%	39%	52%	42%
Cognitive load	10%	7%	8%	8%	0%	9%	11%	6%	8%	5%	0%
Concerns around utility/validity of CBD	12%	7%	13%	8%	9%	9%	0%	6%	10%	5%	21%
Evaluation anxiety/fatigue	14%	11%	13%	15%	5%	6%	11%	9%	10%	7%	0%
Preoccupation with EPAs	0%	4%	0%	15%	5%	0%	0%	9%	8%	5%	0%
Stress from chasing staff to complete EPAs	33%	50%	36%	19%	50%	44%	37%	26%	35%	33%	26%
Worried about achieving requirements	52%	32%	33%	35%	45%	44%	16%	54%	37%	21%	53%
None	2%	0%	3%	8%	5%	6%	5%	0%	0%	2%	16%

The number of responses by institution is not provided in this table to avoid identifying institutions. Data from institutions with fewer than 10 responses are not presented.

Table 7A – Aspects of CBD having greatest positive impact on health and wellness

Aspects of CBD having greatest positive impact on health and wellness	
Theme	**Sub-theme**
Awareness of progress and expectations (17%)	• Able to view progress to reflect and set goals • Frequent feedback allows residents to view improvement overtime and stay on track • Removes uncertainty and stress around progress
Feel supported by program (16%)	• Guidance and mentorship from academic advisors • Encourages staff to focus on resident learning and provide feedback • Reduced anxiety surrounding requesting feedback
Sense of accomplishment (4%)	• Checking off EPAs and meeting targets • Feeling accomplished after receiving positive EPAs and progressing through training
Increased confidence (3%)	• Feeling more confident in competencies after receiving positive feedback • Receiving specific coaching and feedback in weaker areas builds competence over time

Table 7B – Aspects of CBD having greatest positive impact on health and wellness by discipline

	Overall	Anatomical Pathology	Anesthesiology	Emergency Medicine	General Internal Medicine	General Pathology	General Surgery	Internal Medicine	Obstetrics and Gynecology	Pediatrics	Psychiatry	Unidentified **Medical** Disciplines	Unidentified **Surgical** Disciplines
Total number of responses	280	14	16	14	22	11	11	73	19	16	31	53	18
Increased confidence	3%	0%	6%	0%	0%	0%	9%	3%	5%	6%	3%	0%	0%
Sense of Accomplishment	4%	7%	0%	0%	0%	9%	0%	5%	0%	0%	10%	4%	6%
Removes uncertainty and stress around progress	17%	7%	25%	14%	14%	9%	9%	7%	37%	19%	13%	23%	28%
Feel supported by program	16%	7%	0%	21%	14%	18%	9%	12%	16%	44%	19%	19%	0%
Little to no positive impact	71%	86%	69%	64%	77%	64%	82%	74%	53%	38%	71%	58%	67%

Table 7C – Aspects of CBD having greatest positive impact on health and wellness by institution

		Institution A	Institution B	Institution C	Institution D	Institution E	Institution F	Institution G	Institution I	Institution J	Institution K	Institution L
	Total number of responses	-	-	-	-	-	-	-	-	-	-	-
Awareness of progress and expectations		16%	17%	12%	15%	26%	6%	15%	18%	20%	29%	5%
Feel supported by program/staff		3%	14%	4%	0%	5%	6%	0%	3%	7%	0%	5%
Sense of accomplishment		8%	7%	12%	5%	5%	6%	4%	5%	13%	0%	13%
Increased confidence		3%	3%	12%	0%	5%	6%	4%	3%	0%	7%	3%
Little to no positive impact		73%	62%	56%	80%	58%	73%	78%	75%	67%	71%	74%

The number of responses by institution is not provided in this table to avoid identifying institutions. Data from institutions with fewer than 10 responses are not presented.

Program Support

Residents were asked to comment on what their programs could do to better support residents' health and wellness. Table 7 presents the themes of the frequently cited comments.

Table 8 – Suggestions for program support

Help push faculty to complete EPAs	• Offer incentives for completing EPAs • Penalize those who are not completing EPAs • Implement a mandatory EPA completion rate for faculty
Resident Time	• Advocate for more protected time • Reduce on call shifts • More support/flexibility for time off
Modify EPAs	• Reduce number of required EPAs • More generalized, fewer contextual variables
More leniency/flexibility	• Be forgiving around EPA completion • Allow transfer of EPAs from one stage to another
Listen to Residents	• Listen to and take residents' feedback seriously • Check in with residents regularly • Organize more resident wellness events, retreats, socials
Improvements to platform	• Facilitate EPAs to be done on the spot • Improve the ability of platform to track EPAs
Reduce # of evaluation systems	• Reduce # of forms to be filled out • Eliminate redundancies
Changes to the system	• Reduce #/eliminate EPAs • Revert to traditional system • Complete revamp needed

Discussion

Variability in implementation

Overall Implementation

Overall, 36% of respondents disagreed with the statement that "overall, CBD is going well in my program." This is in comparison to 63% who felt either neutral or agreed with this statement. When stratified by discipline however, there was significant heterogeneity in the level of agreement with this statement, with the percentage of those in disagreement ranging from 15% (Pediatrics) to 54% (Anatomical Pathology). Similarly, there were regional differences between institutions with the level of agreement, with disagreement ratings by institution, ranging from 17% to 57%. These results suggest that there are contextual factors at each level (discipline, institution) that are playing a role in how CBD is being implemented, and there is a need to further analyze and evaluate what these specific factors are to identify opportunities for improvement.

Key Component Implementation

The extent to which key components of CBD were implemented, as experienced by respondents, was also highly variable. Certain components, such as competence committees and electronic portfolios had high fidelity, meaning that ratings from respondents indicated complete or close to implementation as intended. Conversely, components such as coaching in the moment, work-based EPA assessment, and direct observation were less likely to be rated as being completely implemented, indicating that these components had a lower level of fidelity of implementation. In the initial implementation, it was likely that programs were focused on implementing critical operational components of CBD, such as competence committees and electronic portfolios. However, less structural elements, such as coaching in the moment, may require more of a sustained focus on faculty development now that critical functional elements are in place.

Reasons for the incomplete implementation, and low fidelity of implementation, are suggested in the challenges section of the report. For instance, residents reported that it was often a challenge getting faculty to complete EPA observations in a timely fashion. This challenge can be connected to the incomplete

implementation of components such as direct observations, workplace-based EPA assessment and subsequent coaching in the moment. Further exploration of how the challenges are connected to the implementation of key components could help identify opportunities for targeted interventions that lead to improvements.

Like overall implementation, there is a large amount of variability in the degree to which key components of CBD have been implemented across disciplines and institutions. Some disciplines and institutions are well on their way to achieving ideal key component implementation, as experienced by resident physicians, while others appear to be slowly progressing or struggling with implementation. This variability could be a reflection of how closely aligned to CBD a discipline or institution was prior to beginning the transition, rather than an indicator of implementation success versus non-success. For instance, some disciplines may have already had some of the components of CBD (e.g., direct observation, coaching) embedded in their daily routine prior to the implementation of CBD. Variation might be also related to the phased roll-out of CBD with the different start dates by discipline, or the earlier adoption of aspects of CBD by some institutions and programs. Again, a further look into why this variability exists and what factors contribute to the differing levels of implementation will be key to determining how and where to offer support or to help make any necessary adjustments or adaptations.

Impact on Health and Wellness

Previous work has identified that CBD is having an impact on resident physician health and wellness (e.g. Program Director Pulse Check surveys, FMRQ reports, RDoC National Resident Survey). This survey provided the opportunity to ask resident physicians directly about the nature of this impact and what the driving factors were. Findings from the study confirmed that the transition to CBD has had a negative impact on health for many respondents.

Once again, there was substantial variability in the results between disciplines and between institutions, and there are likely a variety of reasons for, or factors contributing to, this variability. The narrative comments, however, identified the following seven common themes as having greatest negative impact on health and wellness in relation to the transition to CBD:

- Stress from chasing staff to do EPA observations
- Administrative burden

- Worried about achieving requirements
- Concerns around utility/validity of CBD/EPAs
- Cognitive load
- Evaluation/performance anxiety
- Preoccupation with EPAs

The consistency in some answers, and the level of detail provided by residents to characterize these themes, offer not only opportunities for further investigation, but also for direct action. Finding ways to help alleviate the stress, worry, and workload associated with CBD implementation is a primary focus of on-going discussions around CBD. The information gathered from this study will help to inform these discussions and in identifying ways to improve the resident physicians' experience.

Embracing the Benefits

Results from this study not only reveal the challenges with CBD, but also provide an opportunity to highlight successes with the fidelity of implementation, as well as some signals of integrity of implementation. Narrative comments indicate that some resident physicians are encountering benefits with CBD implementation. Harvesting and sharing these benefits and positive experiences may offer an opportunity to understand what aspects of implementation have allowed for some resident physicians to experience a more fruitful transition than others.

Limitations

While attempts have been made to ensure that the results from this survey are reflective of resident opinions across Canada, there are several limitations. The response rate for this survey was 15.2%. While this rate is similar to previous RDoC surveys and is satisfactory, it does mean that there are many residents who did not provide their unique experiences and perspectives. It is unknown if the group of residents who have responded differ from those who have not responded, raising the possibility of selection bias.

Additionally, this survey was conducted at a time when the impacts of COVID-19 were significant and when issues with physician wellness, healthcare capacity, and training site limitations were widespread for a variety of reasons. The issues are complex, and the solutions are not straightforward, and in some cases, challenges may have been exacerbated by the COVID-19 pandemic.

One Piece of the Puzzle

The Resident Pulse Check study is one of the many initiatives and evaluations taking place across Canada to better understand the resident physician experience with CBD implementation. Acknowledging that this study is only one piece of the puzzle, the findings from this study are being reviewed in conjunction with data from other sources as plans for moving forward are considered and adopted.

Both RDoC and the Royal College take the health, wellness, and education of resident physicians very seriously and are committed to working both independently and collaboratively to improve the resident physician training experience. The following section highlights some of the next steps that are being considered and acted upon by the two organizations.

Next Steps

The Royal College plans to:

- Increase the focus on resident wellness in CBD through further investigation and collaboration.
- Further characterize the reasons for differences in the experienced implementation between disciplines and institutions with the purpose of identifying areas for process improvement and implementation support.
- Target key components that have been identified by residents as having lower fidelity of implementation.
- Immediately initiate the development of strategies that address challenges identified by residents with the dual intent of improving the fidelity of implementation and resident wellness.
- Continue to develop and action plans for addressing challenges with workplace-based assessment.

RDoC plans to:

- Convene a team of resident content experts to thoroughly review and analyze data from this survey and other sources for the purpose of gaining a well-rounded picture of the resident experience of CBD.
- Develop a position paper on competency by design that will inform advocacy on strategies to improve the resident experience of CBD.

- Prioritize strategies that have the greatest potential to increase resident well-being while maximizing opportunities to advance their medical education.

Together, the organizations plan to:

- Recognize the importance of collaboration both for resident education and resident wellness. Both organizations share in this important and common goal.
- Conduct serial administration of the survey to assess for change over time, evolution of novel challenges, and for effect of any implemented changes.
- Collaborate on projects/interventions that work to improve the resident experience (both educationally and psychologically).

Appendix A: Project Team

RDoC Team Members	Royal College Team Members
Study Co-Lead **Dr. Kimberly Williams, MD, MSc, FRCPC,** Former President, Resident Doctors of Canada **RDoC Staff** **Ms. Leslie Cuthbertson**, Executive Director **Ms. Victoria Clarke,** Director of Programs – Wellness, EDI and Communications **Mr. Scott Murray,** Director of Programs, Medical Education **Ms. Samantha Lovegrove,** Committee Support Officer & Manager of Program Support	**Study Co-Leads** **Dr. Andrew K. Hall MD, FRCPC, MMEd, DRCPSC** Clinician Educator, Royal College of Physician and Surgeons of Canada **Dr. Tim Dalseg MD, MMEd, FRCPC**, Clinician Educator, Royal College of Physicians and Surgeons of Canada **Royal College Staff** **Ms. Lisa Gorman**, Manager, Education Strategy, Innovation and Development Unit **Ms. Stacey Brzezina,** Program Evaluation Analyst, Education Strategy, Innovation and Development Unit **Ms. Sinthiya Selvaratnam,** Program Evaluation Analyst, Education Strategy, Innovation and Development Unit **Ms. Christina Baird,** Senior Communications Advisor, Communications and Marketing

Appendix B – Survey Questions

Competence by Design (CBD) Pulse-Check for Residents

Part 1 - Demographics

Please select your current specialty/subspecialty

- Dropdown list of Royal College specialties/subspecialties

Please select your current 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
- Dalhousie University
- Memorial University of Newfoundland

How long has it been since your program officially launched CBD with the Royal College?

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

Please indicate your current postgraduate training year.

- PGY 1
- PGY 2
- PGY 3
- PGY 4
- PGY 5
- PGY 6
- PGY 7

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	Disagree	Neither agree nor disagree	Agree	Strongly agree

Part 3 – CBD Components 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 shows how the parts of a curriculum are related to one another. In the case of CBD, it links competencies to learning experiences (e.g. rotations), assessment tools (e.g. exams), and CanMEDS roles throughout the stages of training (Ladhani & Writer, 2014). While a curriculum map can be presented in several ways, for resident physicians it is a tool that details the plan for their educational journey.

Curriculum Mapping

1	2	3	4	5

I am not informed of how any parts of my curriculum are linked to one another.	The relationship between the parts of my curriculum have not been updated to reflect CBD.	I am informed of how competencies are linked to **some** learning experiences, assessment practices, CanMEDS roles, or CBD stages.	I am informed of how competencies are linked to **most** learning experiences, assessment practices, CanMEDS roles, or CBD stages.	I am informed of how competencies are linked 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** and 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 feedback generated by supervisors from real 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 resident physicians (Gofton, Dudek, Barton & Bhanji, 2017).

Workplace-Based EPA Assessment

1	2	3	4	5
Supervisors have **not yet** started to perform workplace-based EPA assessment.	Supervisors **rarely** perform workplace-based EPA assessment.	Supervisors **sometimes** perform workplace-based EPA assessment.	Supervisors **frequently** perform workplace-based EPA assessment.	Supervisors **consistently** perform workplace-based EPA assessment as a part of day-to-day work.

Coaching in the Moment

In CBD, all supervisors are encouraged to act as coaches in the clinical environment. Supervisors should provide resident physicians with specific and actionable feedback based on observation that is meant to guide them through a growth process resulting in performance enhancement. This "coaching in the moment" should occur as part of daily work and over the course of a learning experience (Royal College of Physicians and Surgeons of Canada, 2018).

Coaching in the Moment

1	2	3	4	5
Most supervisors have **not yet** engaged in coaching in the moment.	Most supervisors **rarely** engage in coaching in the moment.	Most supervisors **sometimes** engage in coaching in the moment.	Most supervisors **frequently** engage in coaching in the moment.	Most supervisors **consistently** engage in coaching in the moment.

Coaching Over Time

In CBD programs some faculty are designated to act as "coaches over time". This longitudinal process involves the regular review of, and reflection on learning portfolio data between a resident and designated faculty member to guide

development towards competence, individualized learning goals and self-regulated lifelong learning skills (Royal College of Physicians and Surgeons of Canada, 2018).

Coaching Over Time

1	2	3	4	5
A process for resident coaching over time does **not yet exist** in my program.	A process for resident coaching over time has been **designed** but **not yet implemented**.	A process for resident coaching over time has been implemented and takes place **reactively** when a problem has been identified.	A process for resident coaching over time has been implemented and takes place **sporadically.**	A process for resident coaching over time has been implemented and takes place **routinely**.

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 physician progression by competence committees (RCPSC, 2019b).

Electronic Portfolio

1	2	3	4	5
An electronic portfolio is **not yet** being used to record resident	An electronic portfolio is **sometimes** used to record resident observations and **sometimes** to inform my	An electronic portfolio is **regularly** used to record resident observations and **sometimes** to	An electronic portfolio is **consistently** used to record resident observations by supervisors, and **sometimes** to	An electronic portfolio is **consistently** used to record resident observations by supervisors and to **consistently** inform my own

observations.	own progression through training.	inform my own progression through training.	inform my own progression through training.	progression through training.

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

Competence Committee – Competence committees synthesize and appraise qualitative and quantitative data from multiple documented observations to reveal the broad picture of a resident physician's progression toward competence. The committee's processes must be transparent, and outcome decisions made by the committee must be shared with the resident undergoing review in a clear and timely manner (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** communicate committee processes or results to the	A competence committee regularly reviews resident performance, and **usually** communicates committee	A competence committee regularly reviews resident performance, and **usually** communicates committee	The competence committee regularly reviews resident performance, is **transparent** in committee processes and **consistently**

	resident reviewed.	results to the resident reviewed however, committee processes are not.	processes **and** results to the resident reviewed.	communicates results to the resident reviewed effectively and in a timely manner.

Individualized Resident Physician Stage-Based Learning Plans– Competency-Based Medical Education encourages a developmental approach that recognizes that all residents can benefit from documented individualized learning plans and stage-specific supports. These may include special mentors, readings or modified rotations to maximize growth and learning (RCPSC, 2019a).

Individualized Resident Physician Stage-Based Learning Plans

1	2	3	4	5
Individual resident learning plans are **not yet** being used to guide personal learning experiences.	Individual resident learning plans are **rarely** used to guide personal learning experiences.	Individual resident learning plans are **sometimes** used to guide personal learning experiences.	Individual resident learning plans are **frequently** used to guide personal learning experiences.	Individual resident learning plans are **consistently** used to guide personal learning experiences.

Part 4: Resident Physician Education on CBD

1. In the last 12 months, what methods have been used to deliver training on CBD topics to you and other resident physicians in your program? (check all that apply)

A. Workshops
B. Online modules
C. Video recorded sessions
D. Just-in-time training (formal targeted workplace-based training given just before you need it)
E. Grand rounds
F. Email-based information
G. Paper-based information
H. In the moment resident education from supervisors
I. In the moment resident education from other residents
J. Other (please specify)

2. In the last 12 months, what CBD topics have been provided to you and other resident physicians in your program? (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)

Part 5: Benefits and Challenges

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

Question 5b – Briefly describe what your program has 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 physician training can be a particularly challenging time during a physician's career and has the potential to affect resident wellness. Recognizing that there are different ways of defining wellness, in this case we refer to wellness as the complex nature of resident physical, mental, and emotional health and well-being (Wallace, Lemaire, & Ghali, 2009).

Resident Wellness

1	2	3	4	5
I perceive that a transition to CBD has had a **large negative** impact on my health and wellness.	I perceive that a transition to CBD has had a **small negative** impact on my health and wellness.	I perceive that a transition to CBD has **not** had **any** impact on my health and wellness.	I perceive that a transition to CBD has had a **small positive** impact on my health and wellness.	I perceive that a transition to CBD has had a **large positive** impact on my health and wellness.

Question X – What aspects of CBD have the greatest **negative** impacts on your health and wellness?

Question Y – What aspects of CBD have the greatest **positive** impacts on your health and wellness?

Question 8 - What, if anything, could your program do better to support your health and wellness?

Question 9 – Please share any general comments you might have.