ICRE The International Conference on Residency Education

CIFR La Conférence internationale sur la formation des résidents

# Conference Research Abstracts

# Résumés de recherche de la conférence

## A New World of Residency Education: Game Changers and Proven Practices

## Une nouvelle ère de formation des résidents: changements de paradigme et pratiques avérées

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**2021 Virtual International Conference on Residency Education**

*La Conférence internationale sur la formation des résidents virtuelle 2021*

**Conference Research Abstracts**

*Résumés de recherche de la conference*

Since 2012, the *Journal of Graduate Medical Education* (*JGME*) and the Royal College of Physicians and Surgeons of Canada have jointly selected the Top Research in Residency Education from abstracts submitted to the annual International Conference on Residency Education (ICRE).

The submitted research paper abstracts provide a forum for those who use systematic scholarly methods to evaluate educational programs, identify new phenomena, define aspects of training, and assess competence.

Each year, reviewers pick the Top Research in Residency Education and Top Resident Research abstracts that are presented at ICRE.

Winning abstracts are published in the December 2021 issue of *JGME* and are available online via the *JGME* website (www.jgme.org).

**1**

**Pivoting for COVID-19: An Evaluation of Virtual Residency Accreditation External Reviews**

A. Ronson, S. Taber, T. Phillips, A. Ray

Royal College of Physicians and Surgeons of Canada, Ottawa, ON, Canada

**Introduction:** Worldwide, medical education pivoted and adjusted to maintain core functions during the COVID-19 pandemic, accreditation included. Under the broad principles endorsed by the Canadian Residency Accreditation Consortium (CanRAC) for continuing accreditation activities during the pandemic, beginning in late spring 2020, the Royal College of Physicians and Surgeons of Canada piloted a virtual accreditation review process for single day external reviews of Canadian residency programs. An evaluation compared the virtual process to an in-person review in terms of feasibility, effectiveness, and rigor.

**Methods:** Virtual accreditation reviews were conducted using video technology for 8 programs within 2 Canadian institutions. A 20-question survey evaluated the virtual review process and experience for postgraduate office staff, program directors, residents, faculty, and surveyors. Eighty stakeholders participated.

**Results:** Participants indicated the virtual process was feasible (91%–99%) with similar effectiveness to the in-person process (82%–89%). Although 53% of surveyors experienced challenges reading body language in a virtual environment, the majority (89%) were satisfied with the interactions and communications with stakeholders and were able to acquire a comprehensive understanding of the program. Stakeholders (79%) reported that the virtual review had the same level of rigor as an in-person review. Challenges included mental exhaustion and the document review process.

**Conclusions:** Our pilot study demonstrated that single day accreditation reviews can effectively shift to the virtual environment without losing the rigor and integrity of an in-person accreditation review. The results of this pilot, including suggestions to improve the wellness experience for volunteer surveyors, informed the larger-scale full institution virtual accreditation reviews conducted by the CanRAC colleges in 2020–2021.

**2**

**A Novel Workplace-Based Assessment Tool: Validity Evidence to Support Its Use in Competency-Based Anesthesiology Residency Training**

A. Kealey[1], F. Alam[1], L. Bahrey[2], C. Matava[3], G. McCreath[3], C. Walsh[3]

[1]Sunnybrook Health Sciences Centre, Toronto, ON, Canada; [2]Toronto General Hospital, Toronto, ON, Canada; [3]Hospital for Sick Children, Toronto, ON, Canada

**Introduction:** Workplace-based assessment (WBA) is key to a competency-based assessment strategy. Concomitantly with our program's launch of Competence by Design, we developed a new formative WBA, the Anesthesia Clinical Encounter Assessment (ACEA), to assess readiness for independence (ie, entrustability) for competencies essential for perioperative patient care. This study aimed to examine validity evidence of the ACEA during postgraduate anesthesiology training.

**Methods:** The ACEA comprises an 8-item global rating scale (GRS), an 8-item checklist, an overall independence rating, and case details. ACEA data were extracted for the University of Toronto anesthesia residents from July 2017 to January 2020. Validity evidence was generated from sources based on the unified theory of validity, including internal structure, relations with other variables, and consequences.

**Results:** We analyzed 8536 assessments for 137 residents completed by 341 assessors. From generalizability analysis, 10 observations (2 assessments each from 5 assessors) were sufficient to achieve the reliability threshold of 0.70 for in-training evaluations. A mean GRS score of 3.65 out of 5 provided optimal sensitivity (94%) and specificity (91%) for determining competency on ROC analysis. Test-retest reliability was high (ICC = 0.81) for matched assessments within 14 days of each other. Mean GRS scores differed significantly between residents based on their training level ($P < .0001$) and correlated highly with overall independence (0.91, $P < .001$). The internal consistency of the GRS (a = 0.96) was excellent.

**Conclusions:** This study provides evidence supporting validity of the ACEA for assessing the competence of residents performing perioperative care and supports its use in competency-based anesthesiology training.

**3**

**Patients as Assessors in Graduate Medical Education: A Scoping Review**

C. Gonsalves[1], M. Gupta[1], T. A. Horsley[2], R. Khalife[1], Y. Park[3], J. Riddle[4], A. Tekian[4]

[1]University of Ottawa, Ottawa, ON, Canada; [2]Royal College of Physicians and Surgeons of Canada, Ottawa, ON, Canada; [3]Harvard Medical School, Boston, MA, USA; [4]University of Illinois at Chicago, Chicago, IL, USA

**Introduction:** Competency-based medical education strives to address societal needs and be learner-centered through its focus on outcomes and observable activities that inform progression of trainee competence. Assessment of competency remains challenging in residency and continues to largely focus on physicians' inferred judgments from case presentations rather than direct observation in the workplace. Seeking patients' perspectives on fundamental competencies could be an influential addition to workplace-based assessment methods. However, the role of patients as assessors deserves additional attention as to how they can inform our feedback practices and contribute to competency decisions. We aimed to explore the evidence for patient involvement using psychometric tools in resident assessment.

**Methods:** Guided by Arskey and O'Malley's framework for scoping reviews, we searched 3 databases (MEDLINE, PubMed, and Embase) prior to November 2019, and updated in July 2020 and February 2021. Two authors independently assessed records for eligibility and included empirical studies of all designs that examined patient involvement in the assessment of residents.

**Results:** We identified 821 records with 41 having met all eligibility criteria. A range of specialties were represented in our study. Patients were primarily included across ambulatory (22 of 41, 53.7%) and inpatient (13 of 41, 31.7%) settings. One-third of studies included patients as a component of a broader assessment approach (eg, multisource [360°] feedback with patient engagement [14 of 41, 34.1%]). The Communication Assessment Tool was the most used instrument (9 of 41, 22.0%) to collect patient feedback. Patients generally provided high ratings and comments on the observed professional behaviors and communication skills in comparison to physicians who focused on medical expertise.

**Conclusions:** Our review suggests that involving patients in resident assessment is feasible and may offer unique insights that are not captured in assessments completed by physicians or other providers. How patients can help confirm or advance judgements on competence attainment remains uncertain but understudied.

**4**

**“The Most Crushing Thing”: Understanding Assessment Burden for Residents in CBME**

M. Ott, R. Pack, S. Cristancho, M. Chin, J. VanKoughnett

Western University, London, ON, Canada

**Introduction:** Faculty assessment burden is an anticipated effect of comptency-based medical education (CBME), but what is the workload for residents? Additional faculty workload is deemed necessary, because the purpose of CBME is to provide a learner-centered education that supports the development of competent physicians and surgeons. However, good intentions can have unintended effects. We need to understand assessment workload in CBME from the perspective of residents.

**Methods:** This study investigates how CBME theory translates to practice in operative and perioperative postgraduate training programs in Canada. The project employs constructivist grounded theory to develop explanatory, contextual models of CBME in social practice. Nineteen residents from 5 training programs in 5 institutions participated in the study through semi-structured interviews averaging 1 hour in length. Questions explored the resident experience of CBME implementation. Themes of a theory to practice “disconnect” concerning intentions for self-regulated learning and formative feedback were identified initially; subsequent interviews explored how these disconnects were occurring through the method of theoretical sampling. Two members of the research team independently coded the data and discussed relationships between concepts with the other members of the team to reach analytic consensus on the results through constant comparison.

**Results:** The experience of assessment burden was strikingly consistent for residents. Rather than being informed and self-directed in their learning, residents described being driven to manage acquisition of entrustable professional activities (EPAs) in a way that made their progression stressful and opaque. While personalities, phase of implementation, and local training cultures played a role in mediating stress, the workload of assessment was generated more by external drivers such as EPA standards and technology interfaces.

**Conclusions:** Resident well-being is at risk through unanticipated assessment burden in managing EPA progression. This research offers critical insight into how this unintended effect of CBME operates and how it can be mitigated.

**5**

**Are We Really Helping Residents Become Better Doctors? Big Data to Examine the Quality of Documented Feedback in Workplace-Based Assessments**

E. Clement, A. Oswald, S. Ghosh, M. Shariff, D. Hamza

University of Alberta, Edmonton, AB, Canada

**Introduction:** Evidence suggests that improving current training methods can better prepare physicians for unsupervised practice. The transition from time-based training to competency-based medical education (CBME) is one proposed solution. However, the shift to CBME requires changes to practices, such as increased direct observation with documented feedback. Further, a significant portion of the core components of CBME is predicated on the quality of documented feedback. As such, the purpose of this study is to use big data to explore the quality of narrative feedback provided to learners.

**Methods:** *Study Design:* Retrospective cohort secondary analysis of existing data. *Data Source*: de-identified entrustable professional activity (EPA) observations from resident portfolios from 24 "live" CBME programs during the 2019–2020 academic year at the University of Alberta. *Data Analysis*: Quantitative framework analysis using the QuAL Score; an established tool to examine the quality of EPA narrative feedback. Kruskal-Wallis rank sum test for non-parametric data was used to explore variance between programs, and epsilon squared (e2) to identify the magnitude of variance. Correlations were calculated using Spearman's rho (r).

**Results**: We examined 5681 EPA observations (25% randomly selected from each program), and mean QuAL Scores ranged from 2.0±1.2 to 3.4±1.4 out of 5. Results indicate a significant and moderate difference in the quality of feedback provided to residents across programs (x2 = 321.38, $P < .001$, e2 = 0.06). The quality of feedback is significantly associated with program size as well as launch year ($P < .001$); however, these associations are very weak (r = 0.08, 0.05, respectively). Exemplars of variable feedback quality are illustrated.

**Conclusions:** Learners received low to moderate quality narrative feedback, irrespective of program size and launch year. While EPAs do not reflect the totality of the trainee-preceptor interaction, this study highlights that supervisors could improve their narrative feedback to support residents' development as competent physicians.

**6**

**The Makeup of Milestones: How Well Are Intrinsic Roles Represented in Existing EPAs?**

A. LoGiudice, S. Monteiro, J. Sherbino, M. Sibbald, G. Norman, T. Chan

McMaster University, Hamilton, ON, Canada

**Introduction:** Competence by Design (CBD) integrates the CanMEDS Roles into entrustable professional activities (EPAs) as part of programmatic assessment. It is unclear how equitably the Intrinsic Roles (ie, Roles beside Medical Expert) are represented in existing EPAs. The primary goal of this study was to measure the representation of Intrinsic Roles in EPA milestones across many specialties. A secondary goal was to see whether this representation differs by stage of training.

**Methods:** Counts of EPA milestones per Role were extracted from official Royal College of Physicians and Surgeons of Canada documents for 40 CBD-ready specialties as of 2020. A Python script collated the data and converted counts into percentages. Descriptive statistics (mean, SD) were calculated, and analysis of variance (ANOVA) tested whether representation of Roles differed by training stage.

**Results:** Medical Expert was represented by just over 50% of all EPA milestones (M = 51.4%, SD = 8.7), followed by Communicator (M = 15.8%, SD = 4.7) and Collaborator (M = 10.9%, SD = 2.8). Remaining Intrinsic Roles represented less than 8% each (SDs < 4). However, this pattern changed markedly in the Transition to Practice stage of training such that Leader (M = 20.2%, SD = 10.2), Scholar (M = 15.9%, SD = 12.6), and Professional (M = 12.6%, SD = 4.7) were much more strongly represented (Role × Stage interaction: F = 40.7, $P < .001$).

**Conclusions:** Consistent with the visual representation of the CanMEDS diagram, about half of all EPA milestones corresponded to Intrinsic Roles, while about half corresponded to Medical Expert. The Transition to Practice stage also showed increased representation of several Intrinsic Roles. Future research should explore the intended and unintended consequences of emphasizing Leader, Scholar, and Professional Roles near the end of training.

**7**

**The Variable Meanings of Entrustment: How Clinical Supervisors Make Entrustment Decisions in Workplace- and Simulation-Based Settings**

T. Jeyalingam[1], C. Walsh[1], W. Tavares[1], M. Mylopoulos[1], K. Hodwitz[1], L. Liu[2], S. Heitman[2], R. Brydges[1]

[1]University of Toronto, Toronto, ON, Canada; [2]University of Calgary, Calgary, AB, Canada

**Introduction:** Entrustment, a central construct in competency-based medical education (CBME), is operationalized in the assessment of entrustable professional activities (EPAs). While EPA assessment is foundational in many CBME systems, research has yet to clarify how supervisors form judgments when assessing the same EPA in both workplace- and simulation-based settings. We aimed to explore the features supervisors report as influencing their entrustment decisions across these assessment settings.

**Methods:** We conducted an interview-based, constructivist grounded theory–informed study involving gastroenterology supervisors and residents at the University of Toronto and the University of Calgary. Supervisors completed separate EPA assessments of a resident's endoscopic polypectomy (a relevant speciality-specific EPA) performance in both workplace- and simulation-based settings. Supervisors were interviewed after each encounter to explore how they made their entrustment decision within and across settings. Transcribed interview data were coded iteratively using constant comparison to generate themes.

**Results:** Based on 20 interviews with 10 supervisors, we found that participants: (1) held multiple meanings of entrustment, both within and across participants; (2) expressed variability in how they justified their entrustment decisions, the related narrative, and numerical EPA assessment scoring; (3) held certain criteria for making entrustment decisions "comfortably" (eg, task authenticity, task-related variability, and opportunity to assess trainee response to unexpected events); and (4) perceived a relative freedom when using simulation to make entrustment decisions due to the absence of a real patient.

**Conclusions:** We found that participants spoke about and defined entrustment in a variety of ways. That variety appeared to lead to variability in how supervisors judged entrustment, both within and across participants and assessment settings. These observed rater idiosyncrasies suggest residency programs cannot assume equivalence of EPA data from different assessment settings. Furthermore, CBME faculty development likely needs to attend to the criteria that supervisors report needing to comfortably make entrustment decisions.

**8**

**"Reduced to My Race Once Again": Perceptions About Underrepresented Minority Students Admitted to Medical Schools in North America**

H. Barootes[1], A. Cong-anh Huynh[1], M. Maracle[1], A. Istl[2], P. Wang[3], A. Kirpalani[3]

[1]Western University, London, ON, Canada; [2]Johns Hopkins University, Baltimore, MD, USA; [3]London Health Sciences Centre, London, ON, Canada

**Introduction:** Racial diversity is vital in promoting the development of culturally competent physicians. To help diversify the applicant pool, many medical schools actively recruit applicants through underrepresented minority (URM) application streams. However, many URM medical students experience acts of marginalization throughout their training, and it is unclear how matriculants from URM streams are perceived by their peers. This study uses online medical discussion forums to provide insight into how URM streams across North America are perceived by both URM and non-URM applicants.

**Methods:** A total of 840 posts from 13 discussion threads in Premed101 (Canadian) and Student Doctor Network (American) discussion forums were analyzed. Participants in the forum included undergraduate students, applicants to medical school, and current medical students from URM and non-URM groups. Inductive content analysis was used to develop a data-driven coding scheme from which several common themes were identified.

**Results:** Despite an overall appreciation for the benefits of a diverse workforce, participants in the forums engaged in heated discussion surrounding URM streams in North America. Our analysis identified prominent perceptions that students admitted from URM streams are of lower quality, that there is a broken admissions process with fear of social change, and that the influence of socioeconomic status is underappreciated by medical schools.

**Conclusions:** Online discussion forums are a novel platform to provide insight into the perceptions surrounding URM medical admission streams. Our study identifies both barriers and enticing factors that influence application to these programs. Ultimately, we highlight prominent misconceptions against which actionable measures should be taken to reduce marginalization against students admitted through these streams.

**9**

## A Multicenter Qualitative Study of the Challenges That Visa Trainee IMGs Experience During Residency Training in Canada

F. Altammar[1], R. Gupta[2], C. Shearer[3], N. Al-Athari[3], S. Manos[3]

[1]Western University, London, ON, Canada; [2]McMaster University, Hamilton, ON, Canada; [3]Dalhousie University, Halifax, NS, Canada

**Introduction:** Externally funded visa trainee international medical graduates (IMGs) make up half of IMGs in Canada, yet little is known about the additional challenges that they face during residency. In this qualitative study, we explored the challenges that IMGs from the Gulf countries experience during residency to help inform possible improvements.

**Methods:** Study participants were recruited by email invitation sent to all visa trainee IMGs enrolled in any of the residency programs at 2 Canadian universities during the 2020–2021 academic year (subspecialty residents were excluded). Participants completed short demographic surveys. Data saturation was achieved following interviews with 19 participants: 17 in virtual focus groups and 2 phone interviews. Interviews were semi-structured, audio-recorded, and transcribed verbatim. Four researchers (2 per site) conducted data analysis using a thematic analysis approach.

**Results:** Three major themes and multiple subthemes that were consistent across all groups emerged, including: social isolation and lack of support, initial culture shock, lack of appropriate orientation to residency; IMG-based discrimination including implicit biases, pervasive racism, and microaggressions from different health care professionals and lack of psychological safety impacting resident wellness; and cross-cultural communication barriers such as understanding the nuances of language and idioms and difficulty understanding feedback. Proposed solutions included IMG-to-IMG near-peer mentorship, interprofessional implicit bias training, program/institutional commitments toward equity and inclusivity, and specific IMG orientations including re-evaluating the Pre-entry Assessment Program in Ontario.

**Conclusions:** IMGs from the Gulf countries face unique challenges in their journey through residency, which include needing to manage IMG-based discrimination. These challenges likely contribute to suboptimal learning, productivity, and wellness during their residency. Potential strategies for some of the various problems are proposed.

**10**

**Development of an Indigenous Admissions Pathway in an Obstetrics and Gynecology Residency Program**

K. Black, C. Felske-Durksen, C. Flood, M. Hyakutake, T. Kemble, M. Manniapik, H. McKennitt, B. Schroeder, R. Rich

University of Alberta, Edmonton, AB, Canada

**Introduction:** Arising from the impacts of historic and ongoing colonialism, Indigenous Peoples in Canada are underrepresented in medicine, and this is accentuated in obstetrics and gynecology (OB/GYN) and other surgical specialties. In an effort to decolonize the admissions process and address the need for substantive equality in postgraduate training, the University of Alberta OB/GYN residency program has developed an Indigenous Admissions Pathway (IAP). This abstract describes the development of the IAP and describes our evaluation of the postgraduate training goals and perspectives of self-identified Indigenous medical students.

**Methods:** Indigenous and allied faculty, residents, community members, and Elders created the application and review process for the IAP. Self-identified Indigenous students at a Canadian medical school were invited to participate in an electronic survey. Analysis included descriptive statistics and a thematic analysis of open-ended questions.

**Results:** The IAP is in its second year. Applicants to the program apply in the usual manner and indicate their application to the IAP through a separate letter of intent. A panel interview including Indigenous faculty, residents, and Elders is held in parallel to the residency program interviews. Thirty-six participants responded to the survey. Eighty-one percent of participants felt that an IAP would influence their choice of residency training program, and 75% would choose this option when applying to a residency program. All participants thought that an IAP would have a positive impact on the delivery of care for Indigenous patients.

**Conclusions:** This study supports the ongoing use of the OB/GYN IAP. An IAP must be accompanied by a robust program of Indigenous professional development and other effective, community-driven initiatives to decolonize postgraduate medical education. This study will be used to improve the IAP with the ultimate goal of increasing Indigenous representation in OB/GYN and improving access to culturally safe care.

**11**

## Analysis of Supervisors' Feedback on Communicator, Collaborator, and Professional Roles During Case Discussions

A. Lafleur, L. Cote, M. Vincent, P. Lemieux, S. Di-Battista, C. Michaud-Couture, H. Witteman

Université Laval, Québec, QC, Canada

**Introduction:** The literature examining the feedback supervisors give to residents during case discussions in the realms of Communication, Collaboration, and Professional Roles (Intrinsic Roles) focuses on analyses of written feedback and self-report.

**Methods:** This was a mixed-methods study conducted from 2017 to 2019. We created scripted cases for radiology and internal medicine resident confederates to present to supervisors, then analyzed the feedback given both qualitatively and quantitatively. The cases were designed to highlight the CanMEDS Intrinsic Roles of Communicator, Collaborator, and Professional. We quantified how much of supervisors' verbal feedback time targeted residents' Intrinsic Roles and how well feedback time was aligned with the role targeted by each case. We analyzed the educational goals of this feedback. We assessed whether feedback content differed depending on whether the residents implied or explicitly expressed a need for particular feedback.

**Results:** Radiologists (n = 15) spent 22% of case discussions providing feedback on Intrinsic Roles (48% aligned): 28% when the case targeted the Communicator role, 14% for Collaborator, and 27% for Professional. Internists (n = 15) spent 70% of discussions on Intrinsic Roles (56% aligned): 66% for Communicator, 73% for Collaborator, and 72% for Professional. Radiologists' goals were to offer advice (66%), reflections (21%), and agreements (7%). Internists offered advice (41%), reflections (40%), and clarifying questions (10%). We saw no consistent effects when residents explicitly requested feedback on an Intrinsic Role.

**Conclusions:** Case discussions represent frequent opportunities for substantial feedback on Intrinsic Roles, largely aligned with the clinical case. Supervisors predominantly offered monologues of advice and agreements.

**12**

## Using Electronic Health Record Data to Facilitate Feedback Discussions and Foster Coaching Relationships

S. Sebok-Syer[1], R. Sedran[2], A. McConnell[2], L. Shepherd[2], J. Shaw[2], A. Dukelow[2], M. Syer[3], L. Lingard[2]

[1]Stanford University, Palo Alto, CA, USA; [2]Western University, London, ON, Canada; [3]Queen's University, Kingston, ON, Canada

**Introduction:** The availability and access of electronic health record (EHR) data is a game changer for medical education. While these data are commonly used for administrative and billing purposes, little is known about their utility for educational aspects such as teaching, assessment, and feedback. The purpose of this study was to pilot a process for using resident report cards based solely on EHR data, which captures both independent and interdependent clinical performance, to support feedback discussions and coaching between emergency medicine (EM) faculty and residents.

**Methods:** Using Action Research methodology, 8 EM residents were presented with individualized report cards containing EHR data metrics from 2017 to 2020; the exact number of report cards for each resident varied depending on their year in training and availability of data. Then, each resident self-selected 1 of 3 EM faculty to engage in feedback discussions and coaching. Dyadic feedback sessions followed the R2C2 framework, were audio-recorded, and transcribed prior to analysis.

**Results:** While some participants expressed concerns about data representation and subsequent interpretation, every resident expressed that having a personalized report card was valuable for learning. Moreover, opportunities for in-depth conversations with faculty allowed residents to explore report card content, identify areas for improvement, and receive detailed, personalized feedback and tailored coaching regarding their clinical performance.

**Conclusions:** Our findings document a process for using resident report cards based on EHR data to facilitate feedback discussions and foster coaching relationships between faculty and residents. Employing resident report cards revealed that participants were keen on having access to EHR data metrics that reflect resident clinical performance and eager to build coaching relationships to support interpreting such data. This work has gleaned important insights about how faculty and residents interpret EHR data and has implications for how we use EHR data metrics in the context of competency-based medical education moving forward.

**13**

## “We Don’t Really Talk About It”: Role Modeling and Coping With Patient Deaths in the ICU

H. Hartman-Hall[1], S. Selinger[2]

[1]MedStar Health, Ellicott City, MD, USA; [2]MedStar Health, Baltimore, MD, USA

**Introduction:** Medical trainees may experience distress when faced with a patient death, and many see a need for improved training in dealing with deaths. In this qualitative study, internal medicine (IM) residents and their ICU attendings were interviewed about their experiences with patient deaths to understand how role modeling (intended or not) affects resident learning about coping with patient deaths.

**Methods:** Interviews were conducted with 15 IM residents (9 female; 8 PGY-1, 4 PGY-2, 3 PGY-3) and 7 ICU attendings (2 female; years in practice 1.5–34). Thematic analysis by 2 reviewers identified common themes, and interviews continued until thematic saturation was reached. Using grounded theory methodology, a model for understanding role modeling for residents about coping with deaths was developed.

**Results:** Resident reactions to patient deaths include negative emotions or feeling numb/detached. They may worry about their own inadequacy or blame themselves for the death. Attending reactions may include negative emotional experiences but often involve limited or no emotional reaction. While attendings may have questions about the patient care that was provided, they do not report worrying about their own performance. Gaps in role modeling by attendings were identified: deaths are often not discussed, residents may be confused by their emotional responses to deaths, and resident fears of inadequacy go unaddressed. Residents and attendings cited the possible benefit of team debriefings after a patient death to address these gaps.

**Conclusions:** While there are some similarities in how residents and their ICU attendings respond to patient deaths, significant differences are seen. As a result, gaps in role modeling by ICU attendings and the resulting perceptions of residents in how physicians cope with deaths may be creating an informal curriculum that leaves residents less than well-equipped to cope effectively. Team debriefings after patient deaths may help to bridge these gaps.

**14**

## Ensuring Stability in Surgical Training Program Leadership: A Survey of Program Directors

F. Shariff, F. Wright, N. Ahmed, A. Nadler, J. Hallet

University of Toronto, Toronto, ON, Canada

**Introduction:** Surgical program directors (PDs) have been identified as high risk for emotional exhaustion and burnout. Consequent PD turnover and discontinuity in leadership can affect faculty and trainee success and well-being and the stability of residency programs. Prior studies have documented factors contributing to non-surgical PD burnout; however, rates of early attrition and contributing factors in surgical PDs have not been investigated. This study examined factors affecting surgical PD satisfaction, stressors, and areas where institutions can improve PD support.

**Methods:** A national cross-sectional study of PDs was performed across all accredited surgical subspecialties. Domains assessed via a web-based survey included PD demographic characteristics and compensation, availability of administrative support for programs, satisfaction with the PD role, and factors contributing to PD challenges and burnout.

**Results:** Sixty percent of eligible surgical PDs (81 of 134) responded to the survey from 12 surgical specialties. Significant heterogeneity was seen in tenure, compensation models, and administrative support. All respondents exceeded their protected time for the PD position, and 66% received less than <0.8 FTE of administrative support. One-third of respondents (36%) were satisfied with overall compensation for the position, while 43% were unhappy with compensatory models. Most respondents (70%) enjoyed the PD role, specifically, relationships with trainees and the ability to shape the education of future surgeons. Stressors included insufficient administrative support especially around resident remediation and inadequate compensation, with 37% of PDs considering leaving the post prematurely.

**Conclusions:** The majority of surgical PDs enjoy the role. However, intersecting factors such as disproportionate time demands, lack of administrative support, and inadequate compensation for the role contribute to significant stress and risk of early attrition. Systematic culture change to support PDs via better-defined structural processes and sufficient resources is needed to keep these educators engaged and improve both PDs’ and trainees’ experiences.

**15**

**Curricula, Teaching Methods, and Success Metrics of Clinician Scientist Training Programs: A Scoping Review**

Q. Li[1], K. Wollny[1], T. Christie[1], K. Guenther[1], J. Duong[1], M. Twilt[1], C. Walsh[2], K. Bright[1], G. Dimitropoulos[1], L. Pires[3], L. Pritchard[4], S. Samuel[1], L. Tomfohr-Madsen[1]

[1]University of Calgary, Calgary, AB, Canada; [2]University of Toronto, Toronto, ON, Canada; [3]The Hospital for Sick Kids, Toronto, ON, Canada; [4]University of Alberta, Edmonton, AB, Canada

**Introduction:** A dual commitment to patient care and research uniquely situates clinician scientists to explore pressing health care questions; thus, their declining number is of urgent concern. The complex role of clinician scientists necessitates specialized training programs that target a specific skill set and nurture new trainees. This review describes existing literature about clinician scientist training programs and makes recommendations to inform the development of innovative and inclusive education models.

**Methods:** MEDLINE, CINAHL, and Embase were systematically searched, and identified studies were screened in duplicate. Included studies were primary research describing and evaluating clinician scientist training programs. Using deductive and inductive methods, we extracted information about program characteristics, curricula, teaching strategies, and success measures. Data were analyzed using descriptive statistics.

**Results:** Of 7544 citations, 81 met inclusion criteria. Most studies were published within the last decade (59, 72.3%), were from the United States (54, 66.7%), and described programs providing broad clinician scientist training (64, 79.0%). A minority of programs provided funding (37, 45.7%) or protected research time (11, 13.6%), and few addressed needs of trainees from underrepresented minorities (9, 11.1%). Curricula emphasized research methods (48, 76.2%) and knowledge dissemination (42, 66.7%), while patient considerations were absent. Most programs incorporated aspects of mentorship (55, 67.9%) and used multiple teaching strategies (50, 61.7%) such as direct and interactive instruction. Extrinsic metrics of success (eg, research output; 67, 82.7%) were dominant in reporting program outcomes compared with markers of intrinsic success (eg, career fulfillment: 32, 39.5%).

**Conclusions:** Although training programs are providing clinician scientists with practical research skills, there are opportunities for curricular and pedagogical optimization that may better support this complex career path. Programs can address contemporary issues of wellness and equity by reconsidering their metrics of success and including patient engagement and meaningful diversity training as core tenets of their education models.

**16**

**Exploring Trauma in Medical Training: The Impact of Patient Death During Residency**

W. Ye[1], C. Griffin[1], I. Sverdlichenko[2], D. Brandt Vegas[1]

[1]McMaster University, Hamilton, ON, Canada; [2]University of Toronto, Toronto, ON, Canada

**Introduction:** Patient death is an inevitability of medical training. Subsequent distress, decreased empathy, and worse learning outcomes have been reported among physicians and residents. While debriefing provides space for reflection, which promotes a supportive culture, this infrequently occurs. Early trainees often feel underprepared to manage death. We aimed to ascertain the impacts of patient death, debriefing opportunities, and coping strategies employed by residents at McMaster University.

**Methods:** Trainees across various residency programs who completed an internal medicine rotation at McMaster University were invited to participate. Semi-structured interviews were conducted to understand circumstances, emotional responses, support, coping mechanisms, and preparedness regarding the patient death experience. Interviews were transcribed and coded to identify emerging themes using thematic analysis and constructivist grounded theory.

**Results:** At the time of submission, 10 interviews were conducted and 18 participants recruited. Three main themes were categorized: 1–patient death circumstances; 2–personal and professional impact; and 3–trainee support. Pronouncing death, communicating with families, and unexpected/unknown deaths were common challenges. Feelings of guilt, helplessness, regret, and grief often followed events, amplified by lack of debriefs. Perceived medical culture, power imbalances between staff and trainees, and fear of appearing unprofessional contributed to emotional consequences, which included difficulties sleeping, intrusive thoughts, and emotional distancing in subsequent deaths. Respondents universally felt underprepared for the experience. Some residents were aware of program supports, although none accessed these services. While these experiences are congruent with effects of psychological trauma, they were consistently normalized by trainees.

**Conclusions:** Patient death in medical training can be traumatic for learners and may perpetuate loss of empathy, changes to practice, and residual emotional effects. These experiences are normalized by the medical environment, culture, and the residents themselves. Further focus is needed to better prepare trainees for this phenomenon and examine the culture in which physicians operate.

**17**

## Themes Emerging From Reflections by Pediatric Residents During Social Pediatrics Rotations

K. Connors[1], M. Rashid[1], J. Walton[1], M. Chan[2], B. Islam[1]

[1]University of Alberta, Edmonton, AB, Canada; [2]University of British Columbia, Vancouver, BC, Canada

**Introduction:** Social Pediatrics is the newest rotation included in the General Pediatrics Residency Program at the University of Alberta. Evaluation involves a written reflective assignment identifying assets and disparities that have influenced the health of a child encountered on the rotation. While there are published papers on reflective writing by medical students and residents, none exist in the area of social pediatrics or address how social determinants of health (SDoH) impact an individual's overall health. The research question for this study is: During the Social Pediatrics rotation, how has exploring SDoH led to changes in residents' awareness of their own practice?

**Methods:** Grounded theory was used as a methodology to analyze 35 reflections from the residents who had submitted them as an assignment to their preceptor in the Social Pediatrics rotation. In addition, 10 semi-structured telephone interviews were conducted to further understand residents' perceptions. Interviews were transcribed verbatim and analyzed using thematic analysis.

**Results:** To analyze these reflections and our interviews, our analysis was guided by grounded theory using open, axial, and selective coding, and revealed the following themes: (1) bias, (2) emotional response to experiences, (3) systemic challenges, (4) community, (5) frustration/hopelessness, (6) "everyone is doing their best," and (7) advocacy. Interview data reinforced themes of bias, and systemic challenges and advocacy were also apparent in the interviews, in addition to the following themes: (1) exposures to new populations and locations, (2) increased knowledge of specific populations and resources, and (3) impact of SDoH on overall health.

**Conclusions:** Themes that emerged from residents' experiences during their Social Pediatrics rotation highlight the importance of enhancing residents' education regarding SDoH. Analysis of residents' written reflection assignments and follow-up interviews highlighted the importance of fostering learning experiences not typically encountered in traditional clinical learning environments and the value of reflective practice in physician development.

**18**

**Creating and Sustaining the Pivot to Virtual Primary Care: Implementation and Evaluation of the Virtual Care Competency Training Roadmap (ViCCTR) in a Large Postgraduate Residency Program**

R. Aiyadurai, R. Freeman, B. Grundland, M. Kulasegaram, A. Moaveni, S. Murdoch, M. Mylopoulos, K. Prucnal, N. Woods

University of Toronto, Toronto, ON, Canada

**Introduction:** With the onset of the COVID-19 pandemic and the imperative for physical distancing, family physicians rapidly pivoted to providing virtual care to their patients. However, formal instruction on virtual care was not previously included in many program curricula for family medicine residency training programs. The Virtual Care Competency Training Roadmap (ViCCTR) is an online education that provides content, resources, and assessment supporting the development of skills necessary to ensure comprehensive virtual care consistent with multiple CanMEDS roles, including Medical Expert, Communicator, Health Advocate, and Professional. The ViCCTR modules are grounded in theories from the learning sciences, including adaptive expertise, conceptual coherence, and test-enhanced learning. The purpose of this study was to assess the impact of the ViCCTR modules on residents' ability to provide holistic virtual care.

**Methods:** ViCCTR was distributed to all 360 family medicine residents at the University of Toronto. An iterative cycle of implementation, evaluation, and improvement took place where residents who used ViCCTR were invited for interviews to share their experiences, including emergent practices developed in response to their specific clinical contexts. A series of assessments delivered through the modules were used to objectively assess residents' competencies in virtual care.

**Conclusions:** Early results show that the ViCCTR modules can support future family physicians to meet the demands of clinical reasoning in a virtual setting on an ongoing basis. These modules can easily be shared with and adapted to multiple different residency programs looking to enhance their trainees' virtual care readiness. In addition, the ViCCTR modules can serve as a model for the development of future impactful educational interventions for postgraduate learners.

**19**

**Development and Evaluation of an Annual Research and Scholarship Fair to Promote Resident Engagement in Research**

A. Acai, S. Harms, M. Amlung, J. Lopes, M. McKinnon

McMaster University, Hamilton, ON, Canada

**Introduction:** Engaging residents in research and scholarship is a challenge for many postgraduate medical training programs. While the literature suggests that interest in these activities exists, barriers to participation include insufficient protected time for research, a lack of training and support, and limited mentorship. Addressing these barriers can help enhance residents' proficiency in the Scholar and Medical Expert CanMEDS domains and assist in building a cadre of clinician scientists. This study used the findings of a local needs assessment to inform the development and evaluation of an intervention to increase resident participation in research and scholarship.

**Methods:** A needs assessment consisting of a department-wide survey and a meeting with residents was conducted in the Department of Psychiatry and Behavioral Neurosciences at McMaster University in 2017. Barriers to resident engagement in research confirmed those previously identified in the literature. As one part of a multipronged engagement strategy, a research and scholarship fair was developed to connect learners with researchers in the department.

**Results:** Evaluations following the 2018 (n = 21) and 2019 (n = 10) events revealed that the event fulfilled attendee expectations (86% and 70%, respectively) and should be hosted again (100% and 90%, respectively). In 2019, 50% of learners identified a mentor and planned to stay in contact with this mentor after the event. Qualitative comments were similarly positive.

**Conclusions:** In addition to helping address barriers related to resident engagement in research by connecting residents with available research opportunities and mentors, this event also prompted broader conversations around how research is conceptualized (eg, as a spectrum of engagement with consideration of scholarship as a form of research). Next steps involve continuing to refine the event based on feedback from learners and strengthening evaluation efforts by collecting data on resident engagement in research pre- and post-event as well as identifying research outcomes.

**20**

**Development and Implementation of a Resident-as-Teacher MOOC (Massive Open Online Course)**

M. Sanchez-Mendiola, J. Hernandez Carrillo, C. Gutierrez-Cirlos, L. Kieffer Escobar, M. Tapia-Maltos, J. Naveja-Romero

Universidad Nacional Autónoma de México, Mexico City, Mexico

**Introduction:** Residents have a fundamental role in teaching other residents and medical students. Educational interventions to improve their teaching abilities have been developed in several countries, but much less so in developing countries (http://www.biomedcentral.com/1472-6920/10/17). We designed a face-to-face resident-as-teacher workshop, but the problems of limited outreach, lack of residents' time, faculty resources, large distances among residency sites, and the effects of the pandemic made its implementation difficult. The objective of this study was to develop a resident-as-teacher course in Spanish using MOOC (Massive Open Online Course) methodology.

**Methods:** The National Autonomous University of Mexico (UNAM) Faculty of Medicine in Mexico City is a large medical school, with more than 11000 residents in 100 clinical sites. We used Kern's curriculum development model, adapted to MOOC format (https://www.ncbi.nlm.nih.gov/pubmed/30681454), as well as Pickering's 12 tips for MOOC development, to design a course for implementation in the Coursera platform. A team of clinicians and educators developed 5 modules: residents' teaching role, teaching in the clinics, how to teach psychomotor skills, how to give a conference, and leadership and conflict resolution. Modules are short, practice-oriented activities, with videos, discussion forums, and formative assessment activities. If participants desire a formal UNAM-Coursera certificate, they have to pass the MOOC's summative activities.

**Results:** The MOOC was completed in October 2020, as a 20-hour self-paced course in the Coursera platform (https://es.coursera.org/learn/residente) in Spanish. It was presented in the forum International Open Access Week (http://www.openaccessweek.org/events/el-rol-de-docente-m-dico-residente-presentaci-n-del-mooc) and made available worldwide. Currently, the MOOC has more than 400 residents involved from several Mexican medical schools and other countries in Latin America, as well as Spanish-speaking residents from other places. The Coursera platform provides a large amount of quantitative and qualitative data about the course, which we are in the process of analyzing.

**Conclusions:** The MOOC online modality is feasible for developing residents' educational material, it provides self-paced educational interventions that can be made available to large populations of residents in different geographical locations. Residents need educational material in their own language to improve their teaching skills.

**21**

**Educating for Equity: Development and Implementation of a Social Justice Curriculum in a Large Psychiatry Residency Program**

N. Singhal[1], S. Agrawal[1], L. Andermann[1], L. Barker[1], L. Costa[2], K. Fung[1], A. Gajaria[1], B. Khan[1], L. Munro[1], A. Munshi[1], S. Sediqzadah[1], A. Warnock[1], M. Beder[1]

[1]University of Toronto, Toronto, ON, Canada; [2]Centre for Addiction and Mental Health, Toronto, ON, Canada

**Introduction:** The CanMEDS Health Advocate role is considered one of the most difficult to teach and assess (Poulton and Rose 2015). Our program is developing a curriculum to foster an orientation among residents toward equity and social justice, with learners acquiring the knowledge, skills, and attitudes to identify social and structural determinants of health and recognize them as "conditions to be challenged" rather than "facts to be known" (Sharma et al 2018).

**Methods:** Based on Bruner's idea of a spiral (Harden and Stamper 1999), our curriculum enables residents to revisit themes several times throughout their training to promote sequential building of knowledge and skills. While most residency training is focused on the clinical (micro) level of care, our curriculum focuses on all 3 levels of social accountability (Buchman et al 2016)—clinical (micro), community (meso), and structural/political (macro)—with a focus on interventions leading to improved health and systemic change. Early in their training, residents experience a 4-part course designed and taught by service user educators that centers intersectionality, confronts prejudice, and promotes social justice learning. Next is a 2-block selective (1 month in PGY-1 and 2 months in PGY-3) working with marginalized populations; these clinical experiences are enriched by reading lists, reflective writing, and interactive seminars co-designed and co-delivered by residents, faculty, and community leaders. Health equity issues are also interwoven throughout other curricular areas.

**Conclusions:** Early evaluation data have been highly positive, with residents reporting increased confidence in their capacity to work with marginalized populations and being better equipped to advocate for patients. We are working to develop evaluation methods to determine whether the curriculum is leading to changes in knowledge, attitudes, and actions of residents, and plan to share our experiences more broadly so residency programs across Canada and beyond can achieve similar goals.

**22**

**HiQuiPs (Health informatics Quality improvement Patient safety)—A Novel Free Open Access Medical Education Resource**

A. K. Taher[1], S. Mondoux[2], M. Hacker Teper[1], L. Pozzobon[3], D. Lee[1], C. Parpia[1], S. Campbell[1], M. Hewitt[2], E. Mason[4], L. Chartier[1]

[1]University of Toronto, Toronto, ON, Canada; [2]McMaster University, Hamilton, ON, Canada; [3]University Health Network, Toronto, ON, Canada; [4]University of Alberta, Edmonton, AB, Canada

**Introduction:** There is an increase in quality improvement (QI), patient safety (PS), and health informatics (HI) formal educational programs. However, interactions with stakeholders through numerous projects revealed ongoing gaps in the basic understanding of QI/PS/HI concepts, which create implementation barriers. Free open access medical education (FOAMed) tools have shown success in disseminating educational content. We developed a FOAMed online series called HiQuiPs (Health informatics Quality improvement Patient safety) to address this gap.

**Methods:** We used the Kern's 6-step curriculum development model. We carried out a needs assessment through stakeholder engagement with content experts across the country and a review of currently available content. Goals were: (1) creating a basic understanding of 3 content areas (QI, PS, HI); (2) foundational content expert delivery; and (3) broad interprofessional uptake. Our dissemination strategy involved online blog posts on the CanadiEM platform with regular solicitation of feedback. HiQuiPs launched in July 2018 and as of December 2020 has disseminated 34 posts including collaborations with large organizations like Choosing Wisely Canada, special posts on timely topics such as the COVID-19 pandemic, and a new Experts' Corner. Posts are approximately 1000 words and grounded with practical examples. The site has received 51573 pageviews with 24633 unique views over this period.

**Conclusions:** HiQuiPs is a FOAMed resource that disseminates foundational topics in QI, PS, and HI. Limitations included a formal content evaluation, with future plans for embedded surveys to evaluate content and expansion to more advanced topics and wider health care settings.

**23**

**On Your Marks: Coaching in Residency Education**

H. Chow, C. Newton, J. Ashby

University of British Columbia, Vancouver, BC, Canada

**Introduction:** Research indicates that investing in faculty development improves preceptors' communication and teaching skills in addition to resident assessment. Furthermore, faculty development is key in building social capital and facilitating knowledge mobilization leading to greater collaboration and innovation. Coaching is a term that has recently emerged in medical education literature and often applied in the context of working with medical students and residents. Early indications of employing coaching methods include lower resident burnout rates, perceived ability to improve patient care, and increased awareness regarding the importance of physician-patient communication. When implemented in faculty development, coaches were key in promoting preceptors' understanding of a safe learning environment, in assisting the preceptors with goal setting, and in resident reflection.

**Methods:** In 2015, the University of British Columbia Family Practice Residency program implemented a coach with a sports and education background to nurture faculty development, provide individualized support, and connect clinical educators to the site program. Running coaches have been identified as models for clinical teaching because the role encourages knowing your learner through observation, modeling qualities that reinforce continuous learning, communicating with intention, and team building. A survey of the program coach role was conducted to determine how the position has influenced the program and site's delivery of education.

**Conclusions:** Over the past 6 years, the novel role of the program coach has expanded to include facilitating faculty development workshops, retreats, and research projects; networking and collaborating with professional bodies and community organizations; encouraging clinical faculty in the development of their teaching, curriculum, and evaluation of learners; and sharing educational resources with fellow colleagues and the general public.

**24**

**Vignettes: A Novel Comprehensive Needs Assessment Tool for Faculty Development**

X. Tong, T. Chan, M. Lee, S. Monteiro, S. Park, M. Pratt, Y. Yilmaz

McMaster University, Kitchener, ON, Canada

**Introduction:** Transition to practice and a career in academic health sciences can be challenging for new faculty members. Faculty development aims to support all faculty members during onboarding and throughout their careers. Timely and accurate needs assessment is a perennial challenge in faculty development in academic health sciences programs where faculty members have diverse clinical practices and teaching roles. The COVID-19 disruption afforded a unique opportunity for the Program for Faculty Development at McMaster University to try a new approach to comprehensive and rapid needs assessment.

**Methods:** We used a novel storytelling technique inspired by Design Thinking. Faculty members from a spectrum of teaching practices were recruited to create vignettes about certain fictionalized personas based on their own lived experiences. The resulting document was peer reviewed by the Program for Faculty Development team members. Learning objectives were distilled from the document and compiled into a list of items. Redundant items were removed. The items were further analyzed and indexed in a way that followed the natural life cycle of a faculty member, from recruitment to retirement. Finally, the team reviewed the items and categorized resources to address them.

**Conclusions**: Six faculty members created a compilation document of 5500 words that described 6 unique faculty journeys. From this document, 3 co-authors identified and articulated a collection of learning objectives. After review, 70 items remained. Each item was indexed and further categorized into “onboarding,” “early career,” “mid-career,” and “retirement.” Almost all items could be fully or partially addressed by existing faculty development resources. However, significant addition, adaptation, and revision of content was needed for 22 of the 70 items. Using the “vignettes” method, our team was able to quickly identify gaps in the current resource bank. Faculty developers in other academic health sciences centers may try the vignettes method for their needs assessment projects.

**25**

## Virtual Live Knowledge Translation and Support (ROSe)

D. Burke, O. Ahmad, I. Ahmed, N. McLean, M. Slabbert, A. Thomas, M. Francispragasam

Rural Outreach Support e-medicine (ROSe), Abbotsford, BC, Canada

**Introduction:** More than ever, the need for residents to be actively engaged in the acute management of critical medical illnesses has been illuminated by the current pandemic. A platform is needed by which residents can simultaneously be engaged in active learning and critical patient management.

**Methods:** ROSe is a novel video technology designed by RCPSC physicians, which provides immediate virtual support to residents working in smaller, less-resourced regions. The platform includes a unique app which can be downloaded onto any cellular device, and allows a resident physician to get urgent virtual assistance for any acutely ill patient with the touch of a button. The video technology of the platform facilitates immediate bedside assessments including the use of high-fidelity ultrasound, as well as the sharing of relevant clinical data (labs, ECGs, imaging) to allow for accurate real-time decision-making, along with on-the-fly skills enhancement, all via an encrypted video portal. Furthermore, a transcript of the advice is immediately available on the caller's device, along with relevant guidelines and key points, which can be stored and reviewed at any time. Assessments of knowledge translation and satisfaction (sense of support) will be done at regular intervals for each resident to evaluate the learning achievements.

**Conclusions:** The project has been piloted within rural BC, with positive results. The key features include immediate clinical support, engagement in critical thinking and knowledge translation, and the enhancement of bedside skills. The ultimate goal is the refinement of critical resource management in a limited-resource setting, and is relevant to the CanMEDS roles of Communicator, Collaborator, and Leader.

**Author Index**


Acai, Anita – 19
Agrawal, Sacha – 21
Aiyadurai, Ramanan – 18
Ahmed, Ishtiaq – 25
Ahmed, Najma – 14
Ahmad, Omar – 25
Alam, Fahad – 2
Al-Athari, Nawal – 9
Altammar, Fajer – 9
Andermann, Lisa – 21
Ashby, Jacqueline – 23
Bahrey, Lisa A. – 2
Barker, Lucy – 21
Barootes, Hailey – 8
Beder, Michaela – 21
Black, Kristin – 10
Brandt Vegas, Daniel – 16
Bright, Katherine – 15
Brydges, Ryan – 7
Burke, Don – 25
Campbell, Sabrina – 22
Chan, Mercedes – 17
Chan, Teresa – 6, 24
Chartier, Lucas – 22
Chin, Melissa – 4
Chow, Holden – 23
Christie, Tashia – 15
Clement, Elizabeth Ann – 5
Cong-anh Huynh, Albert – 8
Connors, Kimberly – 17
Costa, Lucy – 21
Cote, Luc – 11
Cristancho, Sayra – 4
Di-Battista, Sara – 11
Dimitropoulos, Gina – 15
Dukelow, Adam – 12
Duong, Jenny – 15
Felske-Durksen, Cassandra – 10
Flood, Cathy – 10
Francispragasam, Mario – 25
Fung, Kenneth – 21
Gajaria, Amy – 21
Ghosh, Soumyaditya – 5
Gonsalves, Carol – 3
Griffin, Candice – 16
Guenther, Kaitlyn – 15
Gupta, Manika – 3
Gupta, Ronish – 9
Gutierrez-Cirlos, Carlos – 20
Hacker Teper, Matthew – 22
Hallet, Julie – 14
Hamza, Deena – 5
Harms, Sheila – 19
Hartman-Hall, Heather – 13
Heitman, Steven – 7
Hernandez Carrillo, Jessica – 20
Hewitt, Mark – 22
Hodwitz, Kathryn – 7
Horsley, Tanya A. – 3
Hyakutake, Momoe – 10
Islam, Bonnieca – 17
Istl, Alexandra – 8
Jeyalingam, Thurarshen – 7
Kealey, Alayne – 2
Kemble, Tibetha – 10
Khalife, Roy – 3
Khan, Bushra – 21
Kieffer Escobar, Luis – 20
Kirpalani, Amrit – 8
Lafleur, Alexandre – 11
Lee, Daniel – 22
Lee, Mark – 24
Lemieux, Patricia – 11
Li, Queenie – 15
Lingard, Lorelei – 12
Liu, Louis – 7
LoGiudice, Andrew – 6
Lopes, Jillian – 19
Manniapik, Maina – 10
Manos, Sarah – 9
Maracle, Marcy – 8
Mason, Ed – 22
Matava, Clyde T. – 2
McConnell, Allison – 12
McCreath, Graham – 2
McLean, Neilson – 25
McKennitt, Hazel – 10
Michaud-Couture, Claudie – 11

Moaveni, Azadeh – 18
Mondoux, Shawn – 22
Monteiro, Sandra – 6, 24
Munro, Lauren – 21
Munshi, Alpna – 21
Mylopoulos, Maria – 7, 18
Nadler, Ashlie – 14
Naveja-Romero, Jesus – 20
Newton, Christie – 23
Norman, Geoff – 6
Oswald, Anna – 5
Ott, Mary – 4
Ott, Michael – 4
Pack, Rachael – 4
Park, Sean – 24
Park, Yoon Soo – 3
Parpia, Camilla – 22
Phillips, Tara – 1
Pires, Linda – 15
Pozzobon, Laura – 22
Pratt, Maria – 24
Pritchard, Lesley – 15
Prucnal, Karina – 18
Rashid, Marghalara – 17
Ray, Adam – 1
Rich, Rebecca – 10
Riddle, Janet – 3
Ronson, Ashley – 1
Samuel, Susan – 15
Sanchez-Mendiola, Melchor – 20
Schroeder, Brittany – 10
Sebok-Syer, Stefanie – 12
Sediqzadah, Saadia – 21
Sedran, Robert – 12
Selinger, Stephen – 13
Shariff, Farhana – 14
Shariff, Manahil – 5
Shaw, Jennifer – 12
Shearer, Cindy – 9
Shepherd, Lisa – 12
Sherbino, Jonathan – 6
Sibbald, Matthew – 6
Singhal, Nikhita – 21
Slabbert, Marietjie – 25
Sverdlichenko, Irina – 16
Syer, Mark – 12
Taber, Sarah – 1
Taher, Ahmed K. – 22
Tapia-Maltos, Marco A. – 20
Tavares, Walter – 7
Tekian, Ara – 3
Thomas, Adam – 25
Tomfohr-Madsen, Lianne – 15
Tong, X. Catherine – 24
Twilt, Marinka – 15
VanKoughnett, JulieAnn – 4
Vincent, Marc – 11
Walsh, Catharine – 2, 7, 15
Walton, Jennifer – 17
Wang, Peter – 8
Warnock, Ashley – 21
Witteman, Holly – 11
Wollny, Krista – 15
Wright, Frances – 14
Ye, Wendy – 16
Yilmaz, Yusuf – 24

## Keyword Index

Accreditation – 1
Admissions – 10
Anesthesiology – 2
Assessment – 2, 3, 4, 12
Burnout – 14
CanMEDS – 6
CanMEDS Intrinsic Roles – 6, 11
Career success – 15
Case discussions – 11
CBME – 3, 7
Clinician scientist – 15
Coaching – 23
Competency-based – 2
Compentency-based medical education – 5
Competency by Design – 6
Continuing professional development – 24
Coping with patient death – 13
COVID-19 – 1
Debriefing – 16
Design thinking – 24
Discrimination – 9
Diversity – 8
EDI – 15
Education – 8
Education innovation – 18
Electronic health records – 12
eLearning – 18
Entrustable professional activities (EPAs) – 5
Entrustment – 7
Equity – 10, 21
Evaluation – 1
Experience – 17
Faculty development – 23
Feedback – 11
Indigenous – 10
Innovations in EM education – 22
International medical graduates – 9
Junior faculty – 54
Knowledge – 25
Marginalized populations – 21
Massive Open Online Courses – 20
Medical education – 16
Needs assessment – 24
Online learning – 20
Patient death – 16
Patient involvement – 3
Performance indicators – 12
Physician grief – 13
Program director – 14
Quality feedback – 5
Quality improvement – 23
Racism – 8
Research – 19
Resident-as-teacher – 20
Resident well-being – 4
Resident/postgraduate education – 12
Residents – 19
Role modeling – 13
Scholarship – 19
Simulation – 7
Social justice – 21
Social pediatrics – 17
Support – 25
Surgical education – 14
Transition to practice – 24
Virtual – 25
Virtual care – 18
Wellness – 9
Workload – 4
Workshop – 17
Written reflection – 1