



2019

The International
Conference on
Residency Education

La Conférence
internationale sur la
formation des résidents



Conference Research Abstracts

Résumés de recherche de la conférence

Diversity in Residency Education:
Training in a World of Differences

Un monde de différence : la diversité
dans la formation des résidents

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2019 International Conference on Residency Education

La conférence internationale sur la formation des résidents 2019

Since 2012, the *Journal of Graduate Medical Education (JGME)* and the Royal College of Physicians and Surgeons of Canada have jointly selected the Top 3 Research in Residency Education papers 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, more than 100 abstracts are submitted and undergo peer review. Three winning abstracts are announced prior to ICRE, and are presented at a juried session during the conference. A Top Research in Medical Education Award and 2 runner-up certificates are given out. Commencing with ICRE 2014, the selection of the Top 5 Resident Papers was included in the award process.

Winning abstracts are published in the December issue of *JGME*, and are available online to readers via the *JGME*'s website (www.jgme.org).

2019 International Conference on Residency Education

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Everyone is awesome: Analyzing letters of reference in a general surgery residency selection process

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Introduction: Resident selection includes reviewing letters of reference (LORs). Given their subjective nature, our ability to rely on LORs is unknown. The purpose of this study was to assess the frequency with which LORs use objective qualifiers to describe applicants and whether these terms are representative of the applicant pool.

Methods: A retrospective cohort analysis of all LORs submitted by Canadian medical graduates to the University of Ottawa general surgery program in 2018 was conducted. A database was created including demographics of applicants and referees. Objective qualifiers identified a priori were recorded (mentions of level, average, comparisons to residents, and percentages). Descriptive statistics were used to analyze the demographics of applicants and LORs, and frequency of use of objective qualifiers.

Results: Three hundred forty-three LORs describing 114 applicants were analyzed. Eighty-two percent ($n = 291$) used objective qualifiers to describe applicants. Of these, 45% of LORs described applicants as functioning at a resident level, 21% as being the “best,” 55% as above average, and only 20% as being average. A global percentage was used in 28% of letters ($n = 97$), and the average score was the 9th percentile. Rankings of applicants called “best” in a LOR ranged from 2nd to 104th in our file review process.

Conclusions: Most LORs use objective qualifiers, which are generally positive. It’s unclear whether the use of positive qualifiers is inflated or whether the absence of a positive qualifier implies a negative impression of the applicant. As such, objective qualifiers alone should not be relied on when assessing LORs.

Selection into Australian orthopaedic surgical training—Selection ranking and training outcomes

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Introduction: The Australian Orthopaedic Association (AOA) undertakes selection, training, and certification in orthopaedic surgery in Australia. We explore the relationship between performance in the orthopaedic training selection process and subsequent training program outcomes.

Methods: Three hundred fifteen trainees were included in this study, representing the cohort of trainees selected between 2007 and 2012 who had either successfully completed the training program, resigned from training, or been dismissed. Final overall selection scores and rankings were compared with 5 training program outcome measures to determine the relationship between selection scores and subsequent performance in orthopaedic training.

Results: Eighteen trainees (5.7%) resigned from the program prior to completion and 9 (2.8%) were dismissed. Female trainees were more likely to resign from training than male trainees. Trainees who resigned had a lower mean selection score than those who successfully completed training. There was no difference in mean selection scores in trainees who were dismissed compared to those who successfully completed training. There was a weak negative correlation between overall selection scores and the number of unsatisfactory terms during training.

Conclusions: Lower overall selection scores correlate with higher numbers of unsatisfactory training terms and likelihood of resignation for orthopaedic trainees, supporting the validity of the selection ranking process. Further research is required into the reasons for the overrepresentation of female trainees in resignations.

An escape room as a novel multiple mini interview station for radiation oncology resident selection

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Introduction: Selection of ideal residency candidates in a fair and effective way is a critical task for residency programs. Our program has designed a selection process that accesses candidates based on objective scoring of the online CaRMS application as well as a multiple mini interview (MMI). A novel escape room–style station was added to the MMI to assess critical thinking, problem solving, and time management skills.

Methods: The MMI had 4 stations, which included the escape room station this year. The escape room station included 9 minutes to solve 5 linked puzzles and then a 3-minute self-assessment period with prompts from the evaluators. Whether or not the candidate successfully “escaped” was not incorporated into the evaluation. Interstation correlations, correlations between individual station rank lists, and the total interview rank list and overall rank list were examined using Pearson correlation coefficient (r).

Results: The escape room was similarly correlated with the total interview rank list ($r = 0.70$) and overall rank list ($r = 0.67$) when compared to the other 3 stations. There was not a significant correlation between the escape room rank list and any of the other station rank lists, indicating that the escape room assessed different characteristics than the other stations and was not redundant.

Conclusions: A novel escape room–style MMI station produced a rank list that was similarly correlated with the overall rank lists, when compared to the standard 3 stations, yet it was not strongly correlated with another station, implying it provided non-redundant assessment information.

The myths and truths of the selection and admissions process in postgraduate medical education

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Introduction: The knowledge gained from acquiring the broader faculty and resident experience can influence decisions around the selection and admissions process. The process is not transparent and can be difficult to navigate for the potential applicant and the postgraduate residency selection and admissions committee.

Methods: Individual interviews were conducted with faculty to understand how postgraduate residency programs make admission decisions. Individual interviews were conducted with residents to determine how they believe those decisions are made. Simultaneously, a historical document analysis was conducted to determine if the resources residents seek out in the selection and admissions process have evolved. Triangulation was used to develop themes.

Results: These data are rich in illustrating the similarities and differences between the faculty's and resident's (retrospective) viewpoints on the selection and admissions process. Both faculty and residents viewed the process as complex and somewhat difficult to navigate. Common differences from both groups were around the meaning of the ideal candidate, weighted value of selection criteria, mental biases, red flags, favored methodologies for selecting candidates, social accountability of admission decisions, and vulnerabilities in the process. The historical document analysis demonstrated that there is a high degree of alignment between documentation and process.

Conclusions: This research provides clarity about the perspectives of what faculty and residents view as necessary to make the selection and admissions process more transparent. This can help identify which areas of the selection and admissions process could be improved and can inform future decisions around how the selection and admission process unfolds.

Comparing 2 approaches to residency application file review

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Introduction: The residency selection process has become increasingly competitive, making selection more challenging. This study's objective was to compare 2 approaches to file review: one focusing on applicant traits (ie, leadership, communication, etc) and the other on file elements (ie, curriculum vitae, reference letters, etc).

Methods: Ten members of the University of Ottawa General Surgery Program file review committee were randomized into 2 groups and evaluated 7 randomly selected Canadian applicant files. The first group scored files based on their elements and the second group based on applicant traits. Feedback was collected for each scoring tool, the discrimination capacity of the tool was measured using variation in scores, and interrater reliability (IRR) was calculated using intraclass correlation (ICC) in a 2-way random effects model.

Results: Both tools identified same top-ranked and bottom-ranked applicants; however, discrepancies were noted for middle-ranked applicants. The score range for the 3 middle-ranked applicants was greater with the trait-based tool (6.43 versus 3.80). The IRR for trait-based scoring was superior to element-based scoring (ICC = 0.82 versus ICC = 0.55). The trait-based tool required only 2 raters to achieve an ICC \geq 0.70. The main criticisms of the trait-based tool were difficulty finding certain traits within the file and longer review time.

Conclusions: Using a trait-based file review strategy can facilitate file review with good reliability compared to element-based. Improved identification of traits within the file can be facilitated by making their role in the review process explicit to applicants and referees.

The examiner as a standardized patient: Exploring the evidence for role-play in the assessment of intrinsic CanMEDS roles at the Royal College Anesthesiology Examination

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Introduction: Assessment of Intrinsic CanMEDS competencies is a complex task that may improve when examiners are immersed in the case. Role-play scenarios (RPS), where examiners playing the role of patients interact with candidates, may impose cognitive demands that impair examiner performance. This study explores whether examiners who are tasked with role-play and assessment (RPE) perform as well as examiners who are tasked only with assessment (OE).

Methods: This observational quasi-experimental study involved assigning examiners to either RPE or OE conditions, paired in the same RPS stations. Both groups received the same examiner training and used a 5-dimension, 5-anchor holistic global rating scale (GRS). To assess for differences in examiner performance, we compared GRS means and calculated interrater correlations between examiner pairs. We surveyed examiners on their impressions related to balancing both roles.

Results: Twenty-one examiners served as raters. There were no differences in the GRS means between RPE (75.8 [SD 7.3]) and OE (75.3 [SD 7.3]) across all days ($P = .41$). Pearson correlations between RPE and OE reached 0.61 for RPS and 0.70–0.83 for other stations. All examiners completed the survey. Seventy-one percent of RPE felt there were minor or no issues in their ability to assess the candidate, 76% had minor or no issues in performing their role, and 73% were able to consider all dimensions simultaneously.

Conclusions: In this context, role-playing examiners scored similarly to examiners who only observed candidate performance. We are reviewing additional validity evidence for this approach.

Examining residents' confidence and accuracy in anesthesiology assessments

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Introduction: Accurate self-assessed performance and clinical judgment of residents is essential for resident development and clinical improvement. We investigated whether self-assessed global entrustment scores of residents significantly differ from faculty scores, and whether differences in faculty and residents' scores vary by resident seniority, faculty leniency, and year of assessment.

Methods: We employed variance components modeling techniques to analyze 329 faculty and self-assessed global entrustment scores among 43 faculty assessors and 15 residents in anesthesiology at Queen's University. Using faculty scores as the "gold standard," we compared faculty scores with residents' scores ($X_{i(\text{faculty})} - X_{i(\text{resident})}$), and assessed residents' confidence accuracy, and over- and under-confidence.

Results: Residents were respectively over-confident, under-confident, and accurate in 10.9%, 54.4%, and 34.7% of the 329 global entrustment assessments. Faculty assessment scores were significantly higher ($\alpha = 0.396$; $z = 4.39$; $P = .0001$) than residents' self-assessed scores. Senior residents were significantly less likely to be under-confident compared to junior residents ($\beta = 0.411$; $z = -2.45$; $P = .014$). Being a lenient faculty assessor ($\beta = 0.509$; $z = 3.57$; $P = .0001$) and a non-lenient or a non-stringent faculty assessor ($\beta = 0.916$; $z = 3.16$; $P = .002$) predicted a higher likelihood of being under-confident. Year of assessment had no effect on residents' accuracy ($\beta = 0.173$; $z = 0.58$; $P = .56$).

Conclusions: These findings may help identify the profiles of under- and over-confident residents and can inform faculty development program targeted at improving competency-based entrustment assessments.

Tell me what's on your mind: Using think aloud to study expertise in reading chest x-rays

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Introduction: The road to expertise is long and requires patience, guidance, and deliberate practice. Understanding the thought processes of experts and comparing them to novices can make pathways to expertise more explicit, thus facilitating more effective training. This research aims to identify differences in the thought process between novices and experts when reading frontal and lateral chest x-rays using think aloud analysis.

Methods: Eleven novices and 12 experts were shown a normal and an abnormal chest x-ray. Participants were asked to verbalize their thought process as they decided whether or not each x-ray was normal, and to elaborate on the nature and location of the abnormality if present. Diagnostic performance was measured using wAFROC on another 40 chest x-rays in the same setting.

Results: Experts outperformed novices in terms of accuracy and confidence. There was no difference between the 2 groups in terms of the number of anatomical structures mentioned upon reporting on the frontal and lateral views. In terms of accuracy, all participants correctly called the normal case “normal,” while for the abnormal case (mastectomy), 1 novice and 2 experts called the case normal. Three different thought pathways were followed in order to reach a diagnosis. For some participants, the presence of a previous mastectomy triggered a search for other findings.

Conclusions: Although novices and experts report a similar number of items upon reading normal chest x-rays, there are differences in terms of the nature of the objects, the pathways of thinking, and the accuracy of diagnosing these imaging studies.

Development and validation of the McMaster narrative comment rating system: A tool for the quality assessment of narrative comments

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Introduction: The shift toward competency-based medical education has prompted a renewed interest in narrative comments. Recent work suggests that narrative comments can provide a reliable way of distinguishing resident performance and help contextualize assessment data for competence committees. However, given the variation that exists in narrative comments, there is a need for tools to help assess their quality so that they can be weighted appropriately. The purpose of this study was to develop and pilot a quality assessment tool for narrative comments.

Methods: Based on a literature search for theoretical principles guiding effective feedback, a quality assessment tool was created with 4 categories: valence of language, extent of praise/criticism, specificity, and actionability. Likert scales were developed for each category in an iterative fashion. Two authors used the tool to independently rate 535 narrative comments of novice trainee performance, which spanned technical and nontechnical skills. The authors were blinded to rater status, learning environment, and skill.

Results: Comments tended to capture criticism rather than praise ($M = 2.13$), were slightly positive in their valence ($M = 0.31$), and exhibited moderate specificity ($M = 3.68$) and actionability ($M = 3.36$). Rater agreement was high among all categories (ICC 0.72–0.91).

Conclusions: We believe this is the first study to create a concise, non–discipline-specific method of evaluating the quality of narrative comments. Our tool has the potential to assist with research on different assessment strategies, inform faculty development on providing effective narrative feedback, and help contextualize data used by competence committees.

Taken out of context: Hazards in the interpretation of written assessment comments

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Introduction: Written comments are increasingly valued in assessment processes. However, a culture of politeness and face saving, and a tendency to conflate assessment with feedback, create a lack of clarity in the language used. Reading between the lines is often necessary for interpretation and is guided by contextual cues. We explored the elements of context that influence the meaning assigned to written comments.

Methods: We used constructivist grounded theory to conduct and analyze interviews with 17 internal medicine faculty, asking them to interpret 2 lists of words: those that might be viewed as “red flags” (eg, good, improving) and those that might be viewed as signaling feedback (eg, should, try). We focused on how they ascribed meaning to words.

Results: Four elements of context were identified as critical for accurate interpretation of words: (1) identity and role of the writer; (2) intended audiences for the comments, which might shape their construction; (3) intended purpose(s) for the comments (assessment, feedback, creation of a permanent record); and (4) culture, including norms around assessment language. These contextual factors are not always apparent; thus, readers must balance the inevitable need to interpret others’ language with the potential hazards of second guessing intent.

Conclusions: Comments are written for a variety of intended purposes and audiences simultaneously, which creates dilemmas for those who must interpret them. Attention to context is essential to reduce interpretive uncertainty and ensure that written comments can achieve their potential to enhance both assessment and feedback.

Contributing evidence toward the validity of the procedure-based assessment in evaluating competency in general surgery training

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Introduction: Procedure-based assessment (PBA) was adopted into the United Kingdom (UK) general surgery program of assessment in 2007 with publication of mandatory PBA criteria for completion of training in 2013. Previous studies have indicated evidence of construct validity by demonstrating an association between increasing operative experience and training level with increasing PBA scores, but were limited in size, geography, or with evaluation of multiple procedures in a single analysis. This study aimed to evaluate the association between operative experience and training level with PBA score in key general surgery procedures.

Methods: UK data relating to PBA and operative experience for all general surgery specialty trainees registered from August 1, 2007 were used. Operative experience and training level were calculated for the first PBA awarded at each level for each trainee. Correlation between exposure variables and PBA level was assessed using Spearman's rank coefficient.

Results: Positive correlation was found between exposure variables and PBA level achieved. Strength of association varied by procedure and exposure variable. Stronger association between operative experience and PBA level was seen in more complex procedures (colectomy and cholecystectomy, $r = 0.70$, $P < .0001$) than simpler procedures (appendectomy and inguinal hernia repair, $r = 0.55$, $r = 0.52$, respectively, $P < .0001$). A similar pattern was seen in the association between time in training and PBA level.

Conclusions: This study demonstrates evidence for construct validity of the PBA. However, variation in association with procedural complexity may indicate that PBA outcomes are less valid as a reflection of competency in simpler procedures.

Evaluating the psychometric properties of the Clinical Case Assessment Tool

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Introduction: The Clinical Case Assessment Tool (CCAT) is a longitudinal assessment platform housing anesthesiology residents' work-based assessments. The CCAT contains 3 global rating scales: preoperative assessment, intraoperative performance, and postoperative plan. This study evaluates the reliability and construct validity of CCAT data.

Methods: Data included all CCATs collected during the foundation's stage of training. Average entrustment scores were calculated for each item across time. Internal consistency (eg, reliability) of CCAT scores was calculated using Cronbach's alpha. Spearman's correlation measured the relationship (eg, construct validity) between mean CCAT scores and percentiles scores for the Anesthesia Knowledge Test (AKT) 1, AKT 6, mean objective structured clinical examination (OSCE) scores, and competence committee ordinal ranking.

Results: Current analyses were based on 2309 CCATs collected over the first 7 blocks of training across 3 separate cohorts (2015, 2016, 2017), with an average 66 CCAT forms (ranging from 51 to 93) per resident. Internal consistency was highest for intraoperative scores (Cronbach's alpha = 0.78), followed by postoperative (alpha = 0.60) and preoperative (alpha = 0.59) scores. Preoperative scores did not correlate with any other metric ($P > .09$). Intraoperative scores correlated with both AKT 6 ($\rho = 0.51, P = .002$) and OSCE ($\rho = 0.45, P = .006$) scores. Similar patterns were found for postoperative items, with higher entrustment associated with AKT 6 percentiles ($\rho = 0.39, P = .02$) and mean OSCE scores ($\rho = 0.35, P = .038$).

Conclusions: Competency-based education requires reliable and valid ways to directly assess trainees in clinical contexts. Intraoperative scores were associated with higher internal consistency. Both intraoperative and postoperative scores were better correlated with other known performance metrics than preoperative scores.

I'm expecting something in return: Resident perceptions of cross-specialty assessment

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Introduction: Competency-based medical education (CBME) hinges on robust assessment. However, integrating regular workplace-based assessment within demanding and sometimes chaotic clinical environments remains challenging. Many faculty lack assessment expertise, and some programs lack the infrastructure and faculty numbers to fulfill CBME's mandate. Recognizing this, we designed and implemented an assessment innovation that trains and deploys faculty to assess in specialties outside their own. Specifically, we studied residents' perceptions of and receptiveness to this novel assessment approach.

Methods: Within the surgical foundations program at Western University, London, ON, Canada, 27 postgraduate year 1 residents were formatively assessed by trained non-surgeons on a basic laparoscopic surgical maneuver. Assessments did not impact a resident's progression. Focus groups were conducted to gauge resident sentiments about the experience of cross-specialty assessment.

Results: Resident perceptions having outside assessors formatively assess a basic surgical task varied. While a few residents found the experience motivating, more often residents questioned the feedback they received and the practicality of this assessment approach in advancing their technical skill acquisition. What residents wanted were strategies for improvement, not merely an assessment of performance.

Conclusions: Residents' trepidation at the idea of using outside assessors to meet increased assessment demands appeared grounded in their expectations for assessment. What they appeared to desire was a coach—someone who could break their performance into its critical individual components—as opposed to an assessor whose role was limited to scoring their performance. Understanding residents' receptivity to new assessment approaches is crucial; otherwise, training programs run the risk of generating more assessments without added learner value.

Oral case presentation: Evaluation of a novel curriculum and development of a competency-based assessment tool in emergency medicine

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Introduction: Oral case presentation is recognized as a central educational and patient care activity but has not been well studied in the emergency setting. The objectives of this study are (1) to develop a competency-based assessment tool to formally evaluate the emergency medicine oral case presentation (EM-OCP) competency of medical students and “transition to discipline” residents, and (2) to develop, implement, and evaluate a curriculum to enhance OCP communication skills in the EM setting.

Methods: An EM-OCP assessment tool and novel blended curriculum were developed based on results from a Canadian survey of emergency physicians and local focus groups. Ninety-six clerkship students were randomly assigned into intervention and control groups. All students’ baseline OCP skills were assessed (pretest) using a standardized patient (SP) case at the beginning of their EM rotation. The intervention group completed the EM-OCP curriculum. All students completed posttests with a different SP at the end of the 6-week EM rotation. Audio recordings of pre- and posttests were evaluated using the assessment tool by 2 blinded evaluators.

Results: Using the Kruskal-Wallis test, all students demonstrated improvement in EM-OCP skills between their pretest and posttest, however, those who received the curriculum (intervention group) showed significantly greater improvement in synthesis of information, communication, and overall entrustment decision score.

Conclusions: Implementation of a novel EM-OCP curriculum resulted in more effective communication and higher entrustment scores. This curriculum could improve OCP performance not only in EM settings but also across specialties where medical students and residents must manage critical patients.

The impact of foregrounding intended use on observer behavior in the assessment of clinical competence

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Introduction: Some educational programs have adopted the premise that the same assessment should serve both formative and summative goals. Though, how observers understand and integrate the intended uses of assessment may affect the way they execute the assessment task. The objective of this study was to explore the impact of foregrounding different intended uses (formative versus summative) on observer behavior.

Methods: In this between-groups mixed-methods study, participants observed 3 prerecorded clinical performances under formative or summative conditions. Participants scored performances using a global rating tool and provided comments. Both groups were then asked to reconsider their ratings from the alternative perspective and given the opportunity to alter their contributions and provide rationales for decisions. We used outcomes based on comments, scores, changes to each, and their stated rationales to explore differences between groups.

Results: Foregrounding different intended uses of assessment data for observers did not result in differences in scores, amount, type of comments (both emphasized evaluative over constructive statements), or the ability to differentiate. When participants were asked to adopt the alternative perspective only small changes in scores or comments were observed. Participants reported that the way they engage in the process is evaluative despite different intended uses.

Conclusions: Foregrounding different assessment purposes did not result in significant systematic differences in the assessment data generated. Raters seem to emphasize evaluative over constructive statements overall regardless of assessment purpose. Future research is needed to explore whether these results hold in social/workplace-based contexts and impact on learners.

Understanding operative experience and competency assessment outcomes in UK general surgery training with respect to current UK requirements for completion of training

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Introduction: Several general surgery curricula worldwide set minimum operative experience standards for key procedures by completion of training. Operative experience at completion of training varies widely. Some countries also expect trainees to demonstrate operative competency using workplace-based assessments. It is unclear whether thresholds for operative experience at completion of training reflect the attainment of competency. This study aimed to calculate the number of operations undertaken prior to award of competency (as judged by the United Kingdom [UK] adopted measure of competency, the procedure-based assessment [PBA]) in key general surgery procedures.

Methods: Data were used relating to operative experience and PBA outcomes for all UK general surgery specialty trainees registered from August 1, 2007. Median operative experience was calculated at award of first and third Level 4 PBA for 5 key general surgery procedures in accordance with current UK data algorithms.

Results: At third Level 4 PBA, trainees undertook a median 72 cholecystectomies (interquartile range [IQR] 48–99), 43 segmental colectomies (IQR 29–61), 69 appendectomies (IQR 42–98), 48 inguinal hernia repairs (IQR 32–71), and 12 Hartmann procedures (IQR 9–16). The number of operations undertaken at award of third Level 4 PBA was greater than the current UK operative experience requirements for cholecystectomy, segmental colectomy, and Hartmann procedure, but fewer than current requirements for appendectomy.

Conclusions: The number of operations undertaken prior to award of competency, as evaluated by the PBA, does not equate to current UK requirements for operative experience at completion of training.

The correlation of workplace-based assessments with periodic performance assessment of emergency medicine residents

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Introduction: Defensible trainee progression decisions in competency-based medical education rely on frequent, honest, low-stakes workplace-based assessment (WBA) of entrustable professional activities (EPAs) by frontline faculty. We aimed to determine whether face-to-face WBA scoring by faculty reflects their true perception of trainee competence.

Methods: All WBA scores for each emergency medicine (EM) resident at a single training site were collected over a 6-month period. Faculty also completed a periodic performance assessment (PPA) tool, which requested anonymous entrustment scores for each EPA assessed in the workplace over the same period. Analysis compared paired WBA and PPA entrustment scores, and compared across faculty, EPAs, and both faculty and EPA.

Results: Assessment data from 21 residents were included in the study. Mean anonymous PPA entrustment scores were consistently lower than face-to-face WBA scores ($P < .001$) across all groupings. Individual WBA scores had a low-moderate correlation with individual PPA scores ($\rho = 0.44$). When scores were averaged across (1) faculty or (2) EPA, there was an increase to a moderate correlation ($\rho = 0.53, 0.54$). When scores were averaged for an individual resident across (3) faculty and EPA, there was a very strong correlation between WBA and PPA scores ($\rho = 0.86$).

Conclusions: There is a low-moderate correlation between an individual faculty's WBA scores and their anonymous longitudinal entrustment for a given resident on a specific EPA. Aggregated scores from multiple faculty and multiple EPAs substantially increased the correlation. These results highlight the importance of using aggregated WBA scores across multiple assessors and EPAs to inform progression decisions.

Patient involvement in resident assessment within Competence By Design: A mixed-methods study

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Introduction: Patients can contribute to resident assessment programs in Competence By Design (CBD). This study explored the extent, nature, as well as the facilitators and hindrances of patient involvement in resident assessment within and across Canadian specialty/subspecialty/special programs that are transitioning or have transitioned to CBD.

Methods: We used a mixed-methods design. In Phase 1, we surveyed program directors (PDs) and analyzed responses using descriptive statistics. In Phase 2, we interviewed PDs from Phase 1 and used a 3-step process to analyze the data.

Results: We obtained 134 of 462 surveys in Phase 1. In Phase 1, 21 of 101 (20.8%) in CBD preparation said that they will involve patients in resident assessment. Of those in CBD field-testing or implementation (n = 33), 5 (15.2%) stated that they do involve patients. Respondents indicated that they will/are involving patients to gain first-hand information on resident performance. They stated that the main reason for not involving patients is a lack of tools to support patient involvement. Respondents thought that patients could assess residents' communication and respectfulness. Phase 2 included 12 interviews with PDs. Interviewees raised 9 factors that facilitate and/or hinder patient involvement in resident assessment, including patients' interests/abilities, guidelines/processes for patient involvement, type of entrustable professional activities, type of patient interactions in programs, and support from health care organizations.

Conclusions: Patient involvement in resident assessment is limited. We need to engage in critical discussions about the extent to which, how, and why we need to enact measures to better support patient involvement in resident assessment.

Resident perceptions of assessment and feedback in competency-based medical education (CBME)

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Introduction: As key participants in the assessment dyad, residents must be engaged with the process. However, residents' experience with competency-based medical education (CBME), and specifically with entrustable professional activity (EPA) based assessments, has not been well studied. We explored junior resident perceptions regarding the implementation of workplace-based assessment (WBA) and feedback initiatives in an internal medicine (IM) program.

Methods: Using a constructivist grounded theory approach, we conducted 5 focus groups with first-year IM residents (n = 28) from the University of Toronto, exploring their experiences with WBA in the first years of the CBME initiative. Residents were exposed to EPA-based feedback tools from early in residency. Themes were identified using constant comparative analysis to develop a framework to understand the resident perception of WBA and feedback initiatives.

Results: Residents' discussion reflected a growth mindset, as they valued the idea of meaningful feedback through multiple low-stakes assessments and coaching. However, in practice, feedback seeking was onerous. While the quantity of feedback had increased, the quality had not; some residents felt it had worsened, by reducing it to a form-filling exercise. The EPA forms were felt to have altered the dynamics of trainee-supervisor relationships, increased daily workload with disrupted workflow, and diminished the distinction between formative and summative assessment.

Conclusions: Residents embrace the driving principles behind CBME, but their experience suggests that changes are needed for CBME to meet its goals. Efforts are needed to reconcile the tension between assessment and feedback and to effectively embed meaningful feedback into CBME learning environments.

Describing schema-based orientations of clinical competency committee decision-making

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Introduction: Clinical competency committees (CCCs) are recognized for playing an increasingly important role in the competency-based medical education (CBME) movement. Despite the importance of CCCs, little is known about the processes they use to make decisions about trainee progression. Based on a review of small group decision-making literature, we proposed a conceptual model describing 3 orientations (ie, schema, constructivist, and social influence) to study the decision-making processes of CCCs. In this study, we used this model to better understand CCC decision-making process.

Methods: Using a multiple case study design, this study was conducted at a single Canadian medical school, where all programs integrated CCCs into their assessment programs. Observations were conducted of 18 CCC meetings across 7 programs over 2 years; field notes were taken by 2 observers, focusing on 178 decisions regarding resident performance and progress. Thematic template analysis was used to code the data.

Results: The majority of decision-making processes were reflective of schema-based orientations where groups used algorithmic processes for decision-making. While these processes were systematic, they were not static; the group's algorithm evolved in response to variation in data. Two key components were identified: referencing and conditional decisions. Referencing occurred when CCCs compared each trainee to entrustable professional activities or to peers. Conditional decisions were used to determine next steps for a trainee such as practicing more test questions or following up with an advisor.

Conclusions: While our study presents preference to schema orientation when performance data are clear, further research is needed to document the other orientations.

Using workplace-based assessments to drive post-call feedback: Can it work?

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Introduction: Workplace-based assessment (WBA) is a critical component of competency-based medical education (CBME). Literature on WBA of performance during overnight call (eg, post-call), however, is limited. We sought to evaluate a new post-call assessment tool for subspecialty overnight call within a pediatric residency.

Methods: Web-based surveys were sent to residents before tool implementation and monthly afterward. Surveys explored frequency of actionable feedback provided and Likert-scale opinions of tool usefulness in facilitating feedback (in CanMEDS medical expert [ME] and manager/leader [M/L] roles), feasibility within clinical workflows, preference for a longer (milestones specified) or shorter (assessment of entrustment, comments alone) tool, and qualitative comments. Quantitative data were summarized using descriptive statistics. Qualitative data were coded to identify themes.

Results: Response rates averaged 41% (average monthly n = 12). Median shifts with ME feedback increased 2 months post-tool (3/4 shifts worked versus 1 pre-tool), but returned near baseline at 4 months. Shifts with M/L feedback (0–1.5/4 versus 1) were unchanged. Residents were divided between agreement (6/16) and disagreement (5/16) on the tool's usefulness facilitating ME feedback, and disagreed on its facilitating M/L feedback (8/16) and feasibility within clinical workflows (10/16). Qualitative analysis revealed themes around non-actionable feedback; barriers to tool feasibility, including handover structure, fellow availability and knowledge, interpersonal burden, and platform issues; and preference for shorter tools.

Conclusions: These findings identify key gaps in using WBA to meet CBME goals of increasing competency developing feedback. Addressing gaps within feedback quality and factors influencing tool feasibility and logistics is essential for successful Competence By Design implementation.

Using narrative feedback to explore the effectiveness of a resident-driven workplace-based assessment of CanMEDS intrinsic roles

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Introduction: Workplace-based assessments are essential for facilitating residents' professional development; however, their usefulness depends on accurate self-assessments and credible feedback—notoriously difficult to obtain, particularly for the non-medical expert roles. To address these challenges, the department of anesthesia created the Clinical Case Assessment Tool (CCAT) online module to encourage greater breadth and depth of residents' and supervisors' narrative assessment of nontechnical skills.

Methods: We conducted a content analysis of more than 3000 narrative comments to examine whether the CCAT generated robust assessments that aligned with CanMEDS 2015. Each investigator independently coded 1 to 2 non-medical expert roles using milestones adapted for anesthesiology; findings were reviewed during a series of team meetings.

Results: Mapping narrative comments onto the adapted milestones proved difficult; comments either did not reflect the skill being assessed or they overlapped with multiple milestones and roles. Additionally, residents and supervisors sometimes assessed a performance differently; in most cases, residents perceived a need for improvement, while supervisors assessed the performance as appropriate for the resident's level of training. Regardless, narrative comments often lacked the specificity and richness required to generate a credible picture of learner performance.

Conclusions: While the CCAT increased the breadth of narrative assessments for non-medical expert roles, it has not yet reached its potential for aligning assessments with CanMEDS, for improving resident self-assessment, or for inspiring rich feedback. We will interview residents and supervisors to better understand the difficulties of assessing nontechnical skills in the workplace. We suspect, however, that more targeted education about the non-medical expert roles is urgently needed.

Understanding resident perceptions of receiving formative feedback from non-physician health care professionals

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Introduction: Non-physician health care professionals (NP-HCPs) may have an important role in providing feedback to residents. Recipient perspectives are key determinants of feedback effectiveness, yet there is a paucity of information about how residents perceive, receive, and use feedback from NP-HCPs. Our purpose was to understand resident perceptions of multi-source feedback (MSF) data and providers.

Methods: Using a constructivist grounded theory approach we interviewed 18 internal medicine residents at different stages of training. Through iterative analysis and constant comparison we identified several themes that capture resident perceptions of and experiences with MSF.

Results: Residents conceptualize what constitutes feedback differently when it comes from NP-HCPs compared to faculty. Perceived feedback utility evolves with training; early residents value feedback on system-navigation, later on honing collaborative skills. Specific feedback is valued through training but global assessment by NP-HCPs are of limited usefulness because of perceived under appreciation for intricacies of residents' roles. Credibility of NP-HCP feedback was not limited to certain individuals or groups, but depended on perceptions of clinical context, alignment with expertise (eg, pharmacy with medical expert, social work with communication), and experience. Feedback from NP-HCPs may compensate for faculty blind spots in directly observed communication, collaboration, professionalism, and leadership, but residents were inconsistent in preferences for receiving this directly from NP-HCPs versus filtered via their faculty, with whom they identified more closely.

Conclusions: Residents value feedback from NP-HCPs, and may benefit from their observation in several CanMEDS domains, but the optimal way to provide MSF and its impact on residents remains unclear.

Exploring the relationship between quantity of workplace-based assessments and resident performance in competency-based medical education

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Introduction: Frequent workplace-based assessments (WBAs) are critical to the success of competency-based medical education (CBME). After transitioning to a CBME-based training program in 2017, we discovered a large variation in numbers of learner-triggered WBAs between residents. Current evidence is inconclusive regarding whether WBAs lead to better resident performance. The purpose of our study was to explore the relationship between the number of assessments a resident obtains and performance of entrustable professional activities.

Methods: Data included all WBAs obtained by first-year internal medicine residents between July 1, 2018 and February 20, 2019 (22 residents, 516 assessments). Residents were divided into 3 groups based on numbers of assessments obtained (low 0–20, medium 21–30, high 31). Global entrustment scores were compared among the groups using analysis of variance.

Results: Mean global entrustment scores for the low, medium, and high assessment number groups were 4.03 (CI 3.89–4.17), 4.25 (CI 4.17–4.34), and 4.27 (CI 4.2–4.34), respectively. Residents with low assessment numbers had a significantly lower global rating compared to residents in the medium and high groups ($P < .01$). The difference in ratings between the medium and high groups was not significant.

Conclusions: Our results demonstrate a correlation between the number of WBAs and mean global entrustment scores. We identify a number of hypotheses regarding why this may be the case and correlate them with existing evidence on feedback-seeking behavior and WBA effectiveness. Understanding these relationships advances our understanding of how to improve assessment seeking among residents, thus enhancing the efficacy of assessment in CBME.

Implementation of competency-based medical education in a Canadian medical oncology training program: Lessons from our first year

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Introduction: As part of a university initiative, competency-based medical education (CBME) was implemented in our medical oncology training program in July 2017. Stages, entrustable professional activity (EPA) assessments, and required training experiences established by the Royal College of Physicians and Surgeons of Canada were adopted. MedTech Central, the electronic portfolio developed at our university, was used for assessment collection. We share here observations and experiences from our first year of implementation.

Methods: Assessment metrics were obtained through MedTech. Ethics was granted by Queen's University as part of an ongoing research study on feedback. Lessons learned were compiled from discussions between the program director, residents, program administrator, CBME education consultant, and CBME lead.

Results: One hundred seventy-nine assessments were completed by participating faculty members from July 2017 to December 2018, and 89% were EPA assessments. Median number of assessments per faculty was 16 (1–42). Fifty-two percent of assessments included written “comments” or “next steps.” A median of 6 assessments per faculty member included specific or actionable feedback. Lessons learned centered on: (1) faculty and resident development and engagement; (2) value of sharing work of CBME; (3) communication strategies with stakeholders; (4) collaboration with other training programs at institutional and national levels; (5) culture change; (6) resident concerns regarding lack of global assessment; (7) assessment plan challenges; (8) burden of CBME; and (9) limitations of e-portfolio.

Conclusions: Our first year of implementation was successful in introducing CBME concepts, workplace-based assessments, and e-portfolios. Ongoing work is needed, including increasing the number of assessments and quality of feedback.

Using a rapid-cycle approach to evaluate implementation of competency-based medical education

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Introduction: Competency-based medical education (CBME) is a model for modern medicine training programs being adopted in Canada. Following the initial institutional CBME implementation (July 1, 2017) at Queen's University and in preparation for national implementation, we aimed to describe key stakeholders lived experience for the foundations of discipline stage in a department of ophthalmology.

Methods: Using a case study approach, a mixed-methods rapid-cycle evaluation was conducted during the 2018–2019 academic year. The first round of interviews and focus groups were completed for key stakeholders (eg, residents and faculty) and were analyzed using a thematic approach. Recommendations were implemented in January 2019 with the second evaluation cycle taking place in March 2019. Quantitative and narrative data from workplace-based assessments are being collected and analyzed.

Results: Fifteen recommendations, 6 entrustable professional activities specific concerns, and 8 strengths were identified from the initial interviews and focus groups. Recommendations included the addition of punctuality, efficiency, and time management to the assessments; faculty cheat sheets on how to trigger assessments; advance notice of upcoming assessment for direct observation; and delivering faculty development on effective feedback. Increased transparency, regular and explicit feedback, early identification of learning needs, and increased resident self-awareness were strengths.

Conclusions: Rapid-cycle evaluation has been a valuable process for identifying key strengths and recommendations following implementation of a new CBME curriculum. Exploring lived experiences in this study resulted in positive and immediate improvements to the residency program. The recommendations and approach will be useful to other departments and institutions as they prepare for CBME.

“Each little change has a ripple effect”: Lessons learned during implementation of Competence By Design in a large established pediatric residency training program

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Introduction: Competence By Design (CBD) is the Royal College of Physicians and Surgeons of Canada competency-based medical education approach for specialist postgraduate medical education across Canada. CBD is an outcomes-based curriculum. Currently, there is focus on understanding the impact of implementation. Expected challenges with implementation include aligning current curriculum content to the new pedagogical structure, working within the constraints of existing workplace realities, and supporting faculty who may be reluctant to change how they teach or have concerns about workload. Within the core pediatric residency program, we aim to address emergent challenges through ongoing, iterative program evaluation informing curriculum development and reform, assessment strategies, and faculty development. Results will inform our ongoing implementation strategy within the broader department.

Methods: Using a qualitative approach, we collected data from key stakeholders, including trainees, clinical and education leaders, and frontline faculty teachers. Focus groups and semistructured interviews were used to evaluate a pilot implementation of workplace-based assessment. The interview guide was co-constructed by a team of clinician and educators. Variation was sought through purposeful sampling. All data were transcribed verbatim, eliminating identifying information and analyzed using NVivo. Manual coding act confirm analysis. Codes were categorized into categories and themes and validated by manual coding by one researcher. Divergences were resolved through discussion.

Results: Eight residents and 6 faculty were interviewed. There was representation among the first 3 postgraduate years and from general, subspecialty, and community-based faculty. Saturation was achieved with no new themes arising from the final interviews. Overall, themes were divided into (1) feasibility of process, (2) quality of interactions, (3) workplace culture, and (4) faculty/trainee development needs. Each theme was further subdivided into subthemes, which provided a platform for program evaluation initiatives to improve continued implementation.

Conclusions: The implementation of CBD into an established educational program is challenging due to competing workflows, established assessment culture, interpersonal interactions, and pedagogical knowledge. A deep, contextual understanding of these issues is required to support positive change and success within CBD implementation.

Resident mental models and experiences of the initial implementation of Competence By Design

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Introduction: Competence By Design (CBD) is a hybrid competency-based model that focuses on residents' abilities in relation to the competencies needed for success in practice. This model is based on 5 components: framework of competencies, sequenced progression, tailored experiences, competency-focused instruction, and programmatic assessment. There has been limited exploration of resident experiences of implementation of CBD thus far. We explored residents' mental models in relation to the core components and their general experiences to identify if CBD implementation in the first 8 disciplines is occurring as it was conceptualized.

Methods: A descriptive qualitative design was used to explore and better understand resident experiences. All residents who had exposure to CBD implementation were invited to participate. We conducted face-to-face or telephone semistructured interviews. Interviews were digitally recorded and transcribed verbatim. Thematic analysis was used to create data-driven codes and identify themes and subthemes. We used an iterative consensus-building process to reach saturation. Research ethics board approval was obtained.

Results: A total of 20 of 50 (40%) residents representing 6 different disciplines from the 1st (n = 4) and 2nd (n = 16) cohorts of CBD implementation were interviewed. Five main themes emerged: (1) value of feedback; (2) strategies for successful entrustable professional activity completion; (3) challenges encountered in CBD; (4) general perceptions regarding CBD; and (5) recommendations to improve on existing challenges.

Conclusions: Exploring residents' mental models of CBD core components and understanding their experiences on the implementation will help identify/disseminate successes, challenges, and future directions from the resident perspective to assist programs at different stages of CBD implementation.

Competency-based medical education implementation: Are we transforming the culture of assessment?

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Introduction: Adopting competency-based medical education (CBME) is challenging. Among the many changes that CBME mandates are more effortful preceptor engagement, assessment, and mentoring. This involves a change in processes and approach and ultimately a change in institutional culture with stakeholders ideally embracing and valuing the new processes. Adopting the transformational change model, this study looks to understand the shift in assessment culture by academic advisors (AAs) and preceptors, and factors facilitating this shift, over 3 years of CBME implementation in a department of family medicine.

Methods: A qualitative grounded theory method was used for this 2-part study. Interviews were conducted with 12 AAs in 2013 and 9 AAs in 2016 using similar interview questions. Data were analyzed through a constant comparative method.

Results: Three overarching themes emerged from data: (1) identified shifts in assessment culture, (2) factors supporting the shifts in assessment culture, and (3) outcomes of the cultural shifts in assessment.

Conclusions: In both parts of the study, participants noted that assessment took more time and effort. In Part 2, however, the effort was mitigated by a sense of value for all stakeholders. With support from the mandate of regulatory bodies, local leadership, department, faculty development, and an electronic platform, a positive cultural transformation occurred in the assessment that enhanced learning and teaching, the use of embedded standards for performance decisions, and tracking and documentation of performance. Studying a single institution and program limits results. An important next step would involve exploring cultural change from a learner perspective.

“Mind the gap in the map”—Curriculum mapping in competency-based medical education implementation of general pathology residency in Saskatoon

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Introduction: Curriculum mapping is a process of indexing a curriculum to identify and address academic gaps, needs, and assessment methods. As Competence By Design (CBD) is implemented in Canada, residency programs must incorporate assessment of residents using entrustable professional activities (EPAs). Judicious use of curriculum mapping within this framework would provide an opportunity to identify and mind the gaps in this map.

Methods: Our general pathology program’s CBD implementation team attended a curriculum mapping workshop organized by the local postgraduate medical education office. They were introduced to the concept of curriculum mapping and then engaged in mapping how and where EPAs were assessed and taught. The CBD team reviewed the map with an educational consultant and discussed academic gaps and needs.

Results: The introduction of curricular mapping process highlighted how the specific language of EPAs often dictates how and where they should be assessed and/or taught. It highlighted gaps in our current program such as a lack of explicitly teaching/evaluating certain EPAs. We used the curriculum map to develop/incorporate rotations and training experiences needed for residents to achieve these EPAs. Minimal structural adjustments were undertaken to incorporate a variety of timely EPA assessments.

Conclusions: Curriculum mapping is an effective tool that helped incorporate CBD specifications of EPAs and assessment into our current residency program. It facilitated the establishment of a teaching plan to address the gaps in the map for EPAs as outlined by the Royal College of Physicians and Surgeons of Canada. It is a work in progress and hopes to track residents achieving their competencies at designated levels.

Using outcome harvesting as a program evaluation tool for CBME implementation at Queen's University

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Introduction: In 2017, Queen's University's 29 specialty programs launched a competency-based medical education (CBME) curriculum for incoming residents. At the start of our transition, Queen's leadership identified outcomes that we hoped would be attributable to CBME. Now, in our second year of implementation, we are determining whether CBME has been implemented as expected and are identifying outcomes that can be attributed to implementation.

Methods: Outcome harvesting (Wilson-Grau, 2012) is a key component of our program evaluation. The outcome harvest was designed using Wilson-Grau's 6 steps in which outcomes were harvested and traced backward to determine how the intervention contributed to the change. Outcomes are then substantiated by artifact analysis coded using qualitative analysis software.

Results: The process has yielded results such as link between stakeholder buy-in and departmental ease of transition to CBME; more output of scholarship and CBME project inception and a link between the pathway to a successful transition and the development of a community of practice. The harvesting process is blended with Queen's program evaluation strategy to capture all facets of the intervention.

Conclusions: Our use of outcome harvesting has helped us identify outcomes that are directly attributable to the implementation of CBME. This has allowed us to define outcomes where the relationship between cause and effect was not fully understood. The information from outcome harvesting is being used to inform the fidelity of CBME implementation at Queen's currently, and in the future.

Coaching for performance change: Development and evaluation of a longitudinal academic coaching program for competency-based medical education residents in anesthesiology

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Introduction: As resident education transitions to competency-based medical education (CBME), trainees become inundated with frequent low-stakes evaluations. Longitudinal academic coaching has been identified as one strategy to help residents use feedback and self-reflection to direct their learning. Sargeant's R2C2 model represents one framework for facilitating coaching relationships with trainees.

Methods: A longitudinal academic coaching program (ACP) was developed for anesthesiology CBME residents at the University of Toronto. Each resident was paired with a faculty anesthesiologist, and both were provided with information about the R2C2 framework. One year after ACP implementation, we surveyed residents and coaches to assess the utilization of the program, perceptions of the program and its R2C2 framework, and resident confidence with goal setting.

Results: To date 16 of 32 (50%) CBME residents and 11 of 22 (50%) faculty coaches have responded to our survey. Pairs have met on average 2 times since implementation. Meeting topics included social connection, goals, and mentoring. Referring to R2C2, most participants reported satisfaction with the rapport between trainee and coach. Many pairs had progressed to exploring reactions and understanding feedback content. Fewer had reached coaching for change, setting short-term goals and then following up on progress. Both groups indicated a desire for increased guidance to improve their ability to create goals for performance change.

Conclusions: The survey of our ACP program highlighted success with the early stages of the R2C2 coaching framework. Based on responses, future directions could include creation of tools to encourage coaching encounters to progress to resident reflection, goal setting, and action plans.

Creating a culture of coaching in postgraduate medical education at Queen's University: Characteristics of effective coaching relationships in the clinical learning environment

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Introduction: There is growing recognition that the adoption of effective coaching behaviors in medical education offers a valuable avenue for improving the quality of interactions between residents and teachers in the clinical learning environment. Previous research has called for a better understanding of the behaviors that foster effective coaching relationships and the context in which those relationships occur. The aim of this study is to determine the characteristics of effective coaching relationships in the clinical learning environment.

Methods: Five focus groups of residents from all postgraduate years and training programs at Queen's University were held. Focus groups were audio- and video-recorded and transcribed while being rendered anonymous. Informed by a social constructionist approach, the data were thematically analyzed.

Results: Preliminary data from 12 participants highlight the importance of the relationship between learner and coach/teacher. Participants emphasized the importance of mutual trust and respect. Further, realistic and individualized expectations that are co-created are perceived to lead to greater growth in resident performance. The focus groups brought to light several previously documented tensions, including the tension between supervision and autonomy and the tension between vulnerability and risk. Interpersonal skills and role modeling may be much more important than previously thought.

Conclusions: Residents identify a variety of characteristics that contribute to effective coaching relationships in the clinical learning environment. This research provides greater insights into residents' perspectives of coaching relationships. These findings may be valuable for informing the design, implementation, and evaluation of future coaching interventions for clinical teachers.

Exploring residents' perspectives of competency-based medical education across Canada

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Introduction: As Competence By Design is being implemented across Canadian residency programs, surprisingly little is known about how residents perceive this method of training. Although they are the group most directly affected by the transition, there has been little research examining resident perspectives. This study examined how Canadian residents understand competency-based medical education (CBME), particularly with respect to advantages, disadvantages, and considerations surrounding implementation.

Methods: This mixed-methods study consisted of a single phase where an online questionnaire of both Likert-type items (6-point scale) and open-ended questions was administered to residents enrolled in postgraduate residency programs across Canada. Four hundred thirty-four residents completed the survey, of whom 295 are from programs before CBME implementation and 139 are currently experiencing CBME. An emergent thematic approach was used to analyze the qualitative survey data.

Results: The positive effects reported by residents in current CBME environments included being more proactive in their learning and engaging in more self-reflection. The most commonly reported concerns included increased time and effort required for assessment, administrative burdens, and increased levels of stress. Concerns from residents currently in CBME environments included learning curves for faculty members, lack of meaningful feedback, and detracting from residents' learning experiences.

Conclusions: Our findings demonstrate that residents across Canada have mixed feelings and experiences regarding CBME. Their positive experiences align with the aim of developing more self-directed learners. However, the reported concerns suggest that programs will need to address specific shortcomings to increase buy-in, and that cultural shifts may be required.

Can teachers distinguish competencies from entrustable professional activities?

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Introduction: There has been a recent transition from the use of competencies to entrustable professional activities (EPAs) in medical education assessment paradigms. Although this transition proceeds apace, there have been few studies examining these concepts in a practical context. Our study sought to examine how distinct the concepts of competencies and EPAs are to frontline clinical educators.

Methods: A 20-item survey tool was developed based on the University of Calgary Department of Family Medicine's publicly available lists of competencies and EPAs. This tool required participants to identify a variety of learning outcomes as either competencies or EPAs, after reading descriptions of these constructs. The tool was administered to a convenience sample of consenting clinical educators at 5 of the 14 training sites at the University of Toronto Department of Family & Community Medicine in 2018. We also collected data on years in practice, hours spent supervising per week, and direct involvement in medical education.

Results: A total of 60 surveys were collected. The mean rate of correct responses was 45.3% (\pm 21.8%). Subgroup analysis failed to reveal any correlation between any of the secondary characteristics and correct responses.

Conclusions: Clinical educators were not able to reliably distinguish between competencies and EPAs. One limitation of our study is a lack of data on how much professional development participating faculty were offered on the constructs in question, as this would have informed their responses. Further research is recommended on the practical use of competencies and EPAs prior to intensive curricular changes.

How the process of capturing an entrustable professional activity observation fits with the intentions of competency-based medical education: A qualitative study

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Introduction: Residency education is in a paradigm shift from a time-based to a hybrid model of competency-based medical education (CBME) involving capturing multiple entrustable professional activity (EPA) observations. One pillar of CBME is the importance of assessment for learning, but it is unclear if residents and preceptors are engaging in the EPA assessment process in ways that generate feedback and support residents in becoming more independent. The purpose of this study was to understand the process of an EPA observation from the perspectives of residents and preceptors.

Methods: The internal medicine residency program at the University of Alberta implemented CBME in July 2017. From March to June 2018, we interviewed 16 residents and 27 preceptors shortly after they electronically documented an EPA observation. Their goals for the observation, how the form and process supported those goals, and what data contributed to the preceptor's assessment of the resident were described. We analyzed the data with qualitative description.

Results: The requirement to complete EPAs initiated the feedback exchange but was perceived as a tick-box exercise. Various preceptors approached the form/process differently, and often based their judgments on multiple observations and normative comparisons rather than entrustment of a given activity.

Conclusions: The EPA process pressured residents to request observations but increased the feedback they received. Preceptors used more data sources than the individual case and did not appear to have entrustment as their primary frame of reference. More faculty and resident development may address inconsistencies in the process and improve alignment with CBME goals.

Document analysis as part of the approach to CBME program evaluation at Queen's University

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Introduction: Queen's University is in its second year of CBME implementation for all 29 postgraduate medical education programs. As a key part of our evaluation of this implementation, we are using document analysis to understand the change process and how it has contributed to program outcomes. Document analysis was used to highlight evidence of the drivers and barriers to successful CBME implementation.

Methods: Through document analysis we have identified several themes and patterns of behavior that are associated with CBME implementation. We used a systematic approach and catalogued documents related to our project areas: scholarship, communications, faculty development, curriculum and assessment, residents, and simulation and technology. We established a repository of documents, and artifacts were coded using qualitative analysis software. Data were aggregated under emergent themes, coded, and then reviewed to ensure interrater reliability.

Results: The results of the analysis generated themes that provided evidence of patterns of significance. When documents were categorized under "collaboration," a number of unique patterns of use were noted. For instance, collaboration was listed as a common theme under all project areas, but was used as a tool to achieve many different objectives, such as to mitigate risk and mitigate time constraints to ensure the sustainability of CBME implementation. Many other themes were discovered and are critical to informing our overall program evaluation.

Conclusions: Document analysis has been vital in tracking Queen's change to CBME over time. It highlights, strengthens, and complements CBME program evaluation and has allowed us to identify the strengths and weaknesses of our implementation.

Building relationships and fostering community during the transition to competency-based medical education: Results from a 3-year longitudinal study

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Introduction: In 2017, Queen's University became the first Canadian institution to transition all 29 specialty and subspecialty residency programs from a time-based model to a CBME model. To monitor and guide our transition, we conducted a 3-year evaluation (July 2015 to June 2018) beginning 2 years prior to the launch of our CBME curricula.

Methods: Using Hall and Hord's (2015) CBAM Levels of Use (LoU) interview protocol, 3 interview data sets were collected in years 1 (n = 39), 2 (n = 52), and 3 (n = 44). In addition to the structured questions in the LoU interview protocol, participants were also asked 8 institution-specific questions. Data sets included interviews with executive members of Queen's Faculty of Health Sciences, program directors, CBME leads, educational consultants, and residents.

Results: Community and relationship building was a strong emergent theme in years 2 and 3. The introduction of educational consultants to support program directors and CBME leads created opportunities for new relationships to develop. Most participants enjoyed the opportunity to work and share information with individuals from other specialties. Participants across sample groups demonstrated empathy for their counterparts as they adjusted to new CBME materials and processes. Increased collegiality and empathy were often attributed to strong top-down, horizontal, and bottom-up leadership, which ultimately resulted in people feeling valued and accountable at all levels.

Conclusions: Use of CBME as an educational innovation increased dramatically in 3 years. Long-term sustainability of new CBME requires that people feel supported, empowered, and accountable throughout the transition process.

Transitions to Competence By Design and implications for resident burnout: A case study

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Introduction: Competence By Design (CBD) promises to radically alter residency education. As mounting evidence links resident wellness with the learning environment, we require insight into how this transition impacts the pressing issue of resident burnout. This qualitative research examined implications of CBD for resident wellness within postgraduate medical education at a Canadian university.

Methods: This exploratory case study involved a literature review, document analysis (n = 30), and in-depth interviews (n = 10) with residents in programs that implement, or are about to implement, CBD (n = 4), educational leaders (n = 4), and administrators (n = 2). Data were analyzed thematically using the constant comparative method.

Results: Realized or anticipated CBD benefits to resident wellness included increased transparency and flexibility, improved feedback, earlier detection of struggling residents, and collaborative decision-making. CBD-related stressors identified included increased administrative workloads, assessment fatigue, technological barriers, lack of staff engagement, and poor quality feedback. Various conditions appear to mediate the impact of CBD implementation on resident well-being, including complex and interconnected societal (eg, ideas of physicians as superhuman), institutional (eg, residency program size, practices, and culture), and individual factors (eg, comfort with administrative tasks).

Conclusions: Implications of CBD for resident burnout will vary according to individual residents' positioning within existing program structures, practices, and cultures, and wider societal and systemic contexts. We require critical, flexible, and holistic approaches to resident burnout that: (1) monitor the unfolding effects of CBD on resident wellness; (2) explicitly address the administrative and emotional work that residents perform; and (3) consider wider contexts for both CBD and resident wellness.

Using resident feedback to inform the development of entrustable professional activities in geriatric psychiatry

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Introduction: The first national cohort of geriatric psychiatry subspecialty residents commenced in 2012. We aimed to capture the perspectives of graduates in this newly accredited program to inform entrustable professional activity (EPA) development for the pending competency-based medical education (CBME) transitions at Queen's (2018) and nationally in 2020.

Methods: A qualitative case study was completed in 2017–2018. Subspecialty geriatric psychiatry graduates who had transitioned to independent practice within the last 5 years were recruited for our study through purposive sampling. Semistructured interviews with surveys integrated between questioning were conducted with 4 graduates. The interviews focused on participants' perceptions regarding confidence in, and relevance of, specific competencies, and how the overall program prepared them for practice. A thematic design was used to analyze the data.

Results: Participants reported needing additional development of their specialized communication and collaboration skills, particularly during conflicts. Gaps in medical expert competencies included providing electroconvulsive therapy, applying medicolegal knowledge in capacity assessment and certification, and managing aging patients with severe persistent mental illness. Participants desired more experience supervising junior trainees in diverse practice settings. Strengths of training included multidisciplinary care and family interventions.

Conclusions: Resident feedback is critical in designing curriculum, particularly in subspecialties, where preparation for niche practice areas is crucial. The interviews yielded relevant information, otherwise not available in a newly accredited subspecialty with relatively few graduates, which may inform revision of EPAs and other curricular elements during the transition to CBME locally and nationally. Next steps will be completing a program evaluation of CBME in this subspecialty.

Trauma surgery exposure among general surgery residents at McMaster University: A retrospective case log analysis

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Introduction: Operative trauma care is a mandatory competency of Canadian general surgery resident training. With Competence by Design (CBD) teaching on the horizon, the Royal College of Physicians and Surgeons of Canada has not yet defined adequate operative trauma exposure during training. To assess the adequacy of operative trauma exposure during residency, we constructed a retrospective trauma operative case log for McMaster University residents over the last decade.

Methods: The Hamilton General Hospital Trauma Registry identified patients from July 2008 to June 2018 who underwent a non-orthopedic/non-neurosurgical trauma procedure. Chart reviews determined procedures and McMaster general surgery residents involved during each procedure. Data were analyzed on SPSS version 24.

Results: During the study period, 417 patients underwent a total of 561 operative trauma procedures (including 306 index laparotomies, 87 second-look laparotomies, and 88 thoracotomies) and 123 residents were enrolled. A resident participated in a procedure 81% of the time. The mean cumulative number of procedures exposed to by postgraduate year (PGY) level was: PGY-1 3.65; PGY-2 4.17; PGY-3 7.10; PGY-4 6.83; and PGY-5 8.74. Residents who completed their entire general surgery residency training within this study period (n = 35) attended a median cumulative of 5 index trauma laparotomies, with distribution as follows: 5 residents were present for ≥ 10 cases, 20 residents were present for 5–9 cases, 13 residents were present for < 5 cases.

Conclusions: Opportunities for operative trauma exposure among general surgery residents at McMaster University are limited. The cumulative operative exposure among graduating residents raises questions about CBD expectations in trauma teaching. We recommend further research on operative trauma in CBD teaching.

Who's watching? Bedside observation and feedback practices in internal medicine

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Introduction: Opportunities to perform work-based assessments frequently occur during bedside teaching (BST). However, observation and feedback practices at the bedside are not well documented in the literature. Our objective was to assess the current use of BST, observation, and feedback during internal medicine rotations.

Methods: We conducted a longitudinal survey study at 5 academic-affiliated hospitals associated with McMaster University. Medical students and residents completing inpatient internal medicine ward rotations between October 2017 and May 2018 were included. The survey encompassed bedside experiences over 1 week. We quantified the frequency of observation and feedback by the type of clinical skill, and utilized a 5-point Likert scale to measure perceived quality of feedback.

Results: The response rate was 63% (192 of 304). Learners received BST on 4 (SD \pm 5.4) patients each week. One-fifth of respondents received no BST, while a quarter received no direct observation. Bedside assessment of discharge planning and history taking occurred least frequently, with three-quarters of respondents (75% and 78%, respectively) reporting no observations. When observation of history taking and discharge planning occurred, feedback was provided to learners less than half the time (44% and 42%, respectively). There was no difference in its perceived feedback quality provided by senior residents versus attending physicians.

Conclusions: Bedside observation and feedback remain underutilized tools for learner assessment. Low rates of assessment were noted for several core clinical skills, including history taking. Training programs transitioning toward CBME should focus on ensuring adequate opportunities for direct observation and feedback of these skills.

Beyond decision-making: The invisible work of clinical competency committees

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Introduction: Programmatic assessment has at its core the ongoing production, review, and feedback of multiple low-stakes assessments. In postgraduate medical education, clinical competency committees (CCCs) serve as the locus of these processes. Despite the proliferation of recent scholarship on CCCs much remains unknown about their inner workings. The aim of this constructivist grounded theory study was to explore the internal processes of CCCs.

Methods: Our sample consisted of 18 CCC meetings in 8 postgraduate programs, selected purposively to represent a range of postgraduate programs. Data were collected through nonparticipant observations and semistructured interviews (n = 18) and analyzed iteratively using a constant comparative method.

Results: CCCs' work extends beyond the review and collation of assessment data. Considerable additional work was required to ensure that data are interpreted appropriately, and that they drive learning in the way programmatic assessment intends. The invisible work of CCCs is organized into 4 types: recalibration of their program of assessment (ie, revision of forms); facilitating trainee exposure to required experiences (ie, purposeful scheduling); tracking and analyzing trends in data (eg, identifying areas of difficulty); and providing individualized coaching to trainees (eg, targeted feedback). Despite the extensive work that CCC members engaged in participants reported finding value in the formalization of CCCs as an assessment strategy.

Conclusions: Our ongoing research suggests that CCCs engage in extensive invisible work that is integral to the successful implementation of programmatic assessment. The resourcing of CCCs may have profound implications for translating programmatic assessment theory into practice.

Signal and noise: Do professionalism concerns impact decision-making of competence committees?

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Introduction: Competence committees (CCs) struggle with incorporating professionalism issues into resident progression decisions. This study examined how professionalism concerns influence individual faculty decisions about resident progression using simulated CC reviews.

Methods: In 2017, the investigators conducted a survey of 25 program directors of Royal College emergency medicine residency training programs in Canada and those faculty members who are members of the CCs (or equivalent) at their home institution. The survey contained 12 resident portfolios, each containing formative and summative information available to a CC for making progression decisions. Six portfolios outlined residents progressing as expected and 6 were not progressing as expected. Further, a professionalism variable was added to 6 portfolios, evenly split between those residents progressing as expected and not. Participants were asked to make progression decisions based on each portfolio.

Results: Raters were able to consistently identify a resident needing an educational intervention versus those who did not. When a professionalism variable was added, the consistency among raters decreased by 34.2% in those residents progressing as expected, versus increasing by 3.8% in those not progressing as expected ($P = .01$).

Conclusions: When using an unstructured review of a simulated resident portfolio, individual reviewers can better discriminate between trainees progressing as expected when professionalism concerns are added. Considering this, educators using a CC in a competency-based medical education program must have a system to acquire and document professionalism issues to make appropriate progress decisions.

To what extent are residents exposed to Indigenous, First Nations, and Métis populations in Canada?

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Introduction: As medical education looks to do its part in addressing the Truth and Reconciliation Commission of Canada: Calls to Action, knowing what is currently being taught to medical students related to aboriginal health issues is an important start. The College of Family Physicians of Canada through its family medicine longitudinal survey (FMLS) has surveyed residents upon entry into residency and at exit on the level exposure they have had with Indigenous populations in their training as a proxy to quantify Indigenous health experiential learning.

Methods: A secondary analysis was conducted on deidentified FMLS aggregate data across entering FM residents in years 2014 and 2015 (N = 1862 with average response rate of 69%) and exiting residents in years 2016 and 2017 (N = 1680) with a 61.5% response rate. Sixteen FM residency programs participated.

Results: On average, 62.4% of entering FM residents, of which > 85% graduated from Canadian medical schools, claim to have had minimal or no exposure to Indigenous populations during their undergraduate training. Upon exit, 46% reported to have had minimal or no exposure to Indigenous populations during their residency, while 31% reported they had more than adequate or a great deal of exposure.

Conclusions: The perceived lack of exposure to Indigenous populations while in training is concerning. Even if courses and seminars are offered, will trainees acquire the skills and behaviors needed without experiential learning provided? Medical educators must work with Indigenous people to co-create effective learning so we can do our part to address the Calls to Action.

The impact of rural rotations on urban based postgraduate learners: A literature review

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Introduction: The chronic shortage of physicians working in rural areas is an international problem. Rural rotations have been promoted as the strategy to recruit specialist physicians to underserved communities by urban-based Royal College postgraduate programs. The systematic evaluation of the impact of rural experiences within an urban based program has not been published. We assessed the published evidence for the impact of rural rotations on urban-based postgraduate learners.

Methods: The Ovid MEDLINE database was searched for articles published in peer-reviewed academic journals between 1980 and 2017. Articles were screened according to predefined eligibility criteria. The MERSQI tool assessed the methodological quality of included papers. Numerical data were synthesized and used to draw inferences about the impact of rural rotations on urban-based postgraduate learners. Data were pooled when study populations and methods were comparable.

Results: The search found 301 articles and 19 studies met the inclusion criteria. An average MERSQI score of 11.95 was found. The articles in the review reported on selected rural rotation characteristics. The length of the rotation appears to be associated with eventual rural practice location. No consensus was found for mandatory rotations and in the timing of rural rotations. The interaction between rural placements and specific demographics was again noted.

Conclusions: Despite the social mandate to respond to the needs of rural communities, there is little systematic evaluation of interventions designed to fulfill the mandate. Rural rotation duration is a significant predictor.

Having to work twice as hard for half the respect: How female surgical residents at the University of Calgary experience gender-based discrimination during postgraduate training

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Introduction: Gender-based discrimination (GBD) has been described in the literature throughout medical school, residency, and into professional practice. Despite the increasing number of women pursuing surgical specialties, there are no studies that have examined how female surgical residents experience GBD during residency.

Methods: To explore how female surgical residents at the University of Calgary experience GBD, a sequential explanatory mixed-methods design was used to combine insights from quantitative and qualitative strands. First, male and female residents across 7 surgical programs completed a cross-sectional survey, which was analyzed using descriptive and inferential statistics. Afterward, interviews with 14 female surgical residents were conducted to explore their experiences of GBD, intending to explain the quantitative findings. Data were analyzed using inductive thematic analysis.

Results: Female residents had significantly more frequent experiences of GBD than male residents from every source and setting. Nurses and patients were the most frequent sources, and the emergency room and operating room were the most frequent settings. Common themes that emerged included having to work twice as hard for half the respect as male colleagues, experiences of harassment and bullying from nursing staff, fear of future consequences in reporting these behaviors, and the impact of GBD on wellness, educational quality, and patient safety.

Conclusions: Female surgical residents commonly experience gender-based discrimination that permeates all aspects of their training. Multiple short-term and long-term solutions can be implemented by academic institutions and departments to tackle structural barriers in order to promote equitable training environments.

Simulation-based learning for ethical skills development in the context of diversity on resident education: A mixed-methods study from a critical, queer, and disability approach

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Introduction: One of the principal causes of human rights violation in Mexico is minorities and diverse group discrimination that leads to a lack of access to patient-centered care. That is why ethical competencies development are mandatory in the context of diversity in residency education. At the Mexican Social Security Institute, the main discrimination causes are religion beliefs, female gender, sexual orientation and gender identity/expression, disabilities, and HIV infection. We believe that simulation-based learning strategies can be used for developing resident ethical skills in the context of equity and diversity.

Methods: A mixed-methods design was used. For the qualitative approach, we used critical, queer, and disability theories to develop the framework to determine expert validated and standardized simulated scenarios, to develop and evaluate the different roles from an ethical perspective, addressing equity and diversity. For the quantitative approach, we constructed and validated an evaluation tool and implemented it before and after the simulation-based learning strategy in a pilot resident group.

Results: We found a significant improvement in the ethical skills in the context of equity and diversity when we evaluated the communicator, health advocate, and professional roles.

Conclusions: Simulated-based learning is of great value for developing ethical skills in the context of equity and diversity in the professional CanMEDS role.

How racism is a barrier to learning in residency: Lessons from a case study

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Introduction: Overt racism in health care is shocking when it occurs. Its impact on recipients is profound and has the potential to negatively affect resident learning when it occurs during postgraduate education. It is known that minority residents face additional burdens due to bias during residency, which is a stressful period for all trainees. Increasing awareness of the effects of racism and providing faculty with tools to deal with challenging situations are crucial to maintaining a positive learning environment.

Methods: We use a descriptive single case study to explore the effect of racism in residency education, as viewed through the lens of sociocultural learning theory.

Results: Racism interferes with residency education by interfering with all aspects of sociocultural learning, including participation, context, content, community, and identity. The development of both competence and physician identity are stifled, and the quality of the learning environment is diminished. By confronting racism the educator has the opportunity to model professional behavior and to illustrate methods to maintain competence and identity in extreme situations.

Conclusions: Educators must be aware that incidents of racism can interfere with learning in residency education. Clinical teachers must be prepared to support and guide residents through incidents of racism, and be offered faculty development to develop these skills.

Unlocking implicit bias: Implementation of an implicit bias workshop to increase resident physician awareness of personal implicit bias and its effect on patient care

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Introduction: The effects of implicit bias are wide-ranging. Physicians' patient care decisions are not immune to the implicit bias, and data showing the effects of it on health care disparities are growing. Our study looked to increase resident awareness and confidence in managing unconscious attitudes and beliefs that may be affecting patient care.

Methods: Participants were 53 internal medicine, pediatric, and family medicine residents. The workshop looked to define implicit bias, demonstrate its origins, and show its societal impact via lecture, hands-on activities, and small group discussion. Via a 7-point Likert scale, a pre- and post-workshop questionnaire measured participants' awareness of implicit bias and confidence in discovering and managing implicit attitudes.

Results: There was a mean increase of resident awareness of general, personal implicit bias (mean increase of 0.938, $P < .001$), and awareness of implicit bias toward patients (mean increase 0.698, $P < .001$). The results also reflected an increase in confidence in discovering personal implicit bias (mean increase 0.358, $P < .001$) and in management of implicit attitudes discovered about patients (mean increase 0.321, $P < .001$).

Conclusions: Our implicit bias workshop proved successful in increasing residents' awareness of their vulnerability to unconscious attitudes and in increasing their confidence in recognizing and managing these attitudes. Although increasing awareness alone is not an adequate strategy for eliminating implicit bias, it has been shown to be effective in beginning to limit unconscious bias. Paired with increased confidence in recognizing and managing these biases, this workshop appears to be a practical and effective first step toward combatting implicit bias.

Like begets like: How the diversity of faculty within surgery training programs impacts which applicants are invited for interviews

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Introduction: Residency programs are developing new assessments to better measure candidate competencies. The methodologies used to develop these tools must provide all applicants an equal opportunity. We measured the influence of residency subject matter expert (SME) demographics on subgroup differences in applicant performance on a new screening assessment.

Methods: Surgical residencies engaged experts to conduct job analyses at their programs. Participating SMEs rated the criticality of 20 core competencies needed among entering residents. From this, 50-item situational judgment tests (SJTs) were created to measure valued competencies across each program. SMEs provided review and input to the tools to determine consensus and inform unique scoring algorithms for their programs. The final SJT was distributed online to eligible applicants, and those with the highest scores were recommended for interviews.

Results: One hundred three SMEs across 7 general surgery residency programs participated (61% white; 68% male; 10–15 per program). SME groups consisted of 60.3% underrepresented minorities (URMs; range 35.7%–80%). A total of 2960 applicants were invited by at least one program to take each program's assessment with 98% completing it. Over half were male (54%) or white (53%) and 72% represented at least one URM. There was a direct relationship between the demographic composition of those recommended for interviews and the demographic composition of SMEs from the respective program, such that less URMs were recommended when SME groups were composed of more white faculty ($r = 0.736$, $P < .05$).

Conclusions: Programs creating new selection assessments should make efforts to maximize the diversity of SMEs participating in item review and validation processes.

Attrition rates of female surgical trainees in Canada

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Introduction: Nearly 60% of Canadian medical students are female yet they continue to be underrepresented in surgical specialty training. Higher attrition rates for female surgical trainees, as seen in other English-speaking countries, could greatly compound this inequality and would warrant further research into the causes and potential solutions. We aim to determine if there is a differential attrition rate between female and male surgical residents across specialties in Canada.

Methods: Surgical trainees in Canadian training programs (excluding ophthalmology and historically obstetrics and gynecology) register for their surgical foundations examination during their first year of training, undertaking the examination typically in their second year. Attrition rates were determined by comparing surgical foundations registration of all Canadian medical school graduates enrolled in a Canadian surgical training program (from 2000–2010) to how many of those individuals challenged their primary surgical certifying examinations by 2018. Between-group comparisons were conducted using a chi-square analysis.

Results: There were 2563 residents from Canadian medical schools and enrolled in Canadian surgical training programs that applied for eligibility for the surgical foundations examination between 2000 and 2010. This sample included 798 women and 1765 men. Women who registered for the surgical foundations examination went on to take their certifying examination 87.7% of the time, while men did so 93.9% of the time ($P < .001$).

Conclusions: Attrition rates for female residents are double the rate for their male counterparts in Canada. Further investigation should identify challenges to surgical training that underlie these discrepancies.

Gender effects in assessment of clinical teaching: Does concordance matter?

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Introduction: Gender bias has been observed in the assessment of teachers, yet the extent of such bias in different specialties is not well-documented. We aimed to determine whether gender bias exists in residents' assessments of faculty in 3 departments and whether gender concordance or discordance has an effect.

Methods: Resident ratings of teachers in internal medicine (800 faculty, 8364 ratings), surgery (377 faculty, 2248 ratings), and family medicine (672 faculty, 3438 ratings) at the University of Toronto from 2016–2017 were analyzed. We averaged ratings on a multi-item 5-point scale to create a teaching score. Faculty and resident gender were coded along with faculty academic rank. A mixed-effects linear regression analysis accounted for nesting of ratings within each faculty.

Results: Gender effects differed across departments. In internal medicine (61.5% male faculty), no significant gender effects were detected. In both surgery (83.8% male) and family medicine (47% male), male faculty received significantly higher scores than female faculty (4.65 versus 4.57 and 4.56 versus 4.38, respectively). In family medicine this was driven by male faculty receiving higher ratings regardless of resident gender ($B = 0.02$; $t = 3.21$; $P < .001$; 95% CI 0.009–0.03). In surgery this was driven by male trainees giving male faculty higher ratings ($B = 0.049$; $t = 5.85$; $P < .001$). Covariates had inconsistent effects on ratings.

Conclusions: Effects were small and favored male faculty; gender concordance only mattered for one department. However, even small differences may have an impact on financial rewards and promotion. Future studies should explore reasons for gender effects in teaching assessments, and why differences may exist between specialties.

Equity, diversity, and engagement in medical education

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Introduction: Research has demonstrated the importance of student diversity in medical education. Diversity has been associated with better educational experiences, learning outcomes, and has been shown to influence minority medical students' choices of residency programs. In order for institutions to build capacity for diversity, they must first start with an understanding of the extent to which various groups feel included and engaged. The purpose of this project was to explore whether institutional culture fosters inclusion and engagement in medical residents.

Methods: An online survey was distributed to medical residents in the college of medicine. Participants were asked to rate various engagement and inclusion factors (common purpose, access to opportunity, equitable reward and recognition, cultural competence, trust, sense of belonging, appreciation of individual attributes, respect). Multiple demographic variables were collected (eg, program, age, ethnicity, religion, sexual orientation). One-way analyses of variance were carried out to explore between-group differences on engagement and inclusion factors.

Results: The composite scores of diversity and inclusion were supportive of overall engagement and inclusion within the institution. Participant ratings were highest for factors of access to opportunity, respect, a sense of belonging, and cultural competence. The lowest ratings were for trust and equitable reward/recognition within the organization. Subgroup analysis showed significant effects ($P < .05$) of postgraduate year, age, and having a disability as impacting both trust and equality factors.

Conclusions: Results can aid in diagnosis and assist in guiding institutional improvement to help achieve inclusiveness and engagement of all members of the institution.

Women in emergency medicine: An innovation to support and mentor

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Introduction: There is increasing awareness in medicine that women experience unique successes and challenges. In some cases, women are disadvantaged by patients, colleagues, and systems. In the spring of 2018, we created a local Women in Emergency Medicine (EM) group to promote awareness while facilitating camaraderie and mentorship among female staff physicians and residents in EM.

Methods: Faculty and trainee physicians who identify as female in 3 divisions of EM (medicine, family medicine, and pediatrics) were invited to participate. An introductory dinner was hosted by staff at a local restaurant to help identify key themes for areas of future discussion. Subsequent meetings were hosted at physicians' homes where food and drink were shared in a potluck fashion. Semistructured discussions were facilitated by a predetermined staff physician lead. To date topics have included difficult encounters, building resilience, and moving past difficult cases. T-shirts with an empowering graphic and slogan for the group were also created by the trainees.

Results: In the future, the Women in EM group plans on hosting a discussion on gender differences in EM for all faculty and residents. As a result of this program, the female physicians have arranged group attendance at an international conference focusing on female emergency physicians, the formation of a burgeoning research/scholarship group, and gender-concordant mentorship.

Conclusions: The creation of a Women in EM group within our division has resulted in increased support, mentorship, and academic engagement.

The effects of gender on multiple mini-interview station scores for selection into Australian orthopaedic surgery

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Introduction: Interviewer gender is said to influence scoring in interview situations. We investigated the relationship between candidate and interviewer gender and interview scores in multiple mini-interviews for the 2018 AOA 21 Australian Orthopaedic Training Program selection process.

Methods: Selection for the AOA 21 Orthopaedic Training Program in Australia is a national process, and 2018 was the first year in which similar numbers of male and female interviewers took part in the national interview process for selection. At least one member of each 3-person interview panel was female. Deidentified results for the multiple mini-interview component of the selection process were reviewed for all candidates. Results were compared for candidate gender and interviewer gender differences.

Results: Two hundred nineteen junior physicians (181 male and 38 female) applied for orthopaedic training in 2018. A total of 144 candidates were interviewed: 123 male (85%) and 21 female (15%). One hundred forty-four interviewers participated in the multiple mini-interviews across 5 states: 79 male (55%) and 65 female (45%). Female and male interviewer scores for each candidate had high correlation ($r = 0.83$). Female interviewers scored the same male candidates ($P < .001$) and female candidates ($P < .01$) significantly lower than male interviewers. Female candidates scored higher than male candidates across all interview stations ($P < .001$).

Conclusions: There is a high correlation among interviewers' scores for selection for individual candidates, with gender differences identifiable in interviewers' scores. Female interviewers score both male and female candidates significantly lower than male interviewers.

Gender group differences in milestone ratings: Exploring differences in ratings by individuals and clinical competency committees

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Introduction: Although not recommended, the ACGME Milestones reporting forms are often used by individual faculty to rate residents' competence. Used in this way, the ratings may be more susceptible to interpersonal biases than when combined with other faculty ratings during a clinical competency committee (CCC) meeting. A recent study of 8 emergency medicine (EM) programs reported gender differences in individual faculty milestone ratings that implied systemic misjudgment of competence that was equated to extended training for women.

Methods: The present study investigated national milestones data generated by CCCs in EM (n = 1340 residents), internal medicine (IM; n = 7062), pediatrics (n = 2634), and diagnostic radiology (DR; n = 846). A multilevel spline regression model was used to determine whether gender was predictive of milestone rating trajectories over the course of residency. Gender differences in rating at time of graduation were also compared.

Results: In all 4 specialties, male and female resident trajectories were almost identical on all subcompetencies: maximum mean difference across all specialties = 0.10 milestone units (out of 5.0). At time of graduation, 4 of 22 subcompetencies were statistically significantly higher for men in IM, and 1 of 12 subcompetencies in DR, while in pediatrics, women were rated higher than men on 6 of 14 subcompetencies. No significant gender difference was found in EM on any subcompetency.

Conclusions: It appears the mediating effect of the CCC group process may reduce the probability for gender bias in milestone decisions regarding progression or graduation. The educational implications require ongoing follow-up, given the importance of this issue.

The difference in communication skills between native Russian and foreign physicians-in-training at Kazan State Medical University, Russia

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Introduction: Postgraduate medical programs in Russia have been accepting citizens or medical graduates from culturally related backgrounds. These programs have mostly been structured around building physician capabilities in clinical specialties. Kazan State Medical University's (KSMU) newly established residency program in internal medicine adopted a comprehensive CanMEDS competency-based curriculum, which accepts foreign citizen residents. We assessed the difference in patient-physician communication skills between native Russian and foreign origin residents.

Methods: A survey assessed communication skills of 28 native Russian and 11 foreign residents involving 190 cognitively intact patients at KSMU participating hospitals. Patients participated in the study, if managed 3 or more days by a trainee during their first year of training. Communication skills were scored by patients utilizing CanMEDS recommended assessment tools. Data were analyzed by SPSS 23.0, using the Mann-Whitney U test ($P \leq .05$) to assess rank differences.

Results: We identified significant differences in 13 of 14 patient-physician communication aspects where foreign residents ranked higher than native in greeting, demonstrating respect, listening attentively, in achieving shared understanding, encouraging raising questions, fostering shared decision-making, planning next steps, demonstrating responsibility, demonstrating sincerity, spending sufficient time, empathy, eye contact ($P < .05$), and overall perceived medical care ($P < .05$).

Conclusions: Overall, foreign origin residents scored significantly higher than native Russian residents on patient-physician communication skills in 13 of 14 tested aspects and perceived medical care. Diversity in medical residency is potentially beneficial in enhancing communication skills. Further assessment is required to identify associated factors of patient-physician communication and perceived medical care differences.

Evaluation of faculty development workshops in Australian orthopaedic surgery training—Reactions and behaviors change

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Introduction: Faculty development is an important but under-evaluated pillar of medical education. The Australian Orthopaedic Association's (AOA) redesigned training program (AOA 21) seeks to equip attending orthopaedic surgeons with contemporary skills for effective feedback, teaching in the clinical setting, and efficient and impactful assessment.

Methods: Four 2-hour interactive faculty development workshops were developed and delivered to surgeons from 2015: Helping Underperforming Trainees, Workplace-Based Assessments (WBAs), Effective Feedback, and Trainee Supervision—A Planned Approach. Workshop participants were invited to evaluate workshop relevance, skills gained, application of learnings, and workshop format (reaction). The trainee feedback and assessments provided by attending surgeons on trainees were analyzed for differences before and after workshop participation (behavior).

Results: Eighty-eight workshops were delivered between June 2016 and February 2019. Seven hundred thirty-four orthopaedic surgeons completed at least 1 of the 4 workshops, and 321 completed evaluations (44% response). Most attendees found the workshops relevant to their needs (91%) and their training role (94%). Ninety-four percent were more confident in their role following the workshop, and 95% intended to implement what they learned. Most attendees found the level of detail (90%) and duration (83%) appropriate. Feedback App and WBA entries were analyzed for surgeons before and after workshop attendance. Quantitative and qualitative text analysis revealed differences after workshop participation.

Conclusions: Orthopaedic surgeons reported a high level of short-term satisfaction with feedback and assessment training in a workshop format. Effects of faculty development workshops on subsequent feedback and assessment metrics are discussed.

Maintaining the momentum for the transition to Competence By Design: CBME strategic planning

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Introduction: The transition to Competence By Design (CBD) poses several challenges, including information overload, limited financial and human resources, development of information technology, and supporting the diverse needs of programs going through different stages of the transition simultaneously.

Methods: In October 2018, the McMaster University Postgraduate Medical Education–Competency-Based Medical Education (CBME) Office held a strategic planning retreat that brought together residency program directors, residency program administrators, departmental education vice-chairs, residents, hospital leaders, researchers, education leaders from the distributed sites, information technology specialists, and others. The purpose of this meeting was to develop a strategic plan that would help guide the work of the CBME office for the next 1 to 3 years.

Results: Momentum for the ongoing transition to a competency-based model of residency education needs to be sustained. To do so, 4 areas for action were identified: (1) training and education tools to facilitate and support the transition; (2) resources (human, financial, education) to support the change; (3) information technology that will support the new model of assessment; and (4) program evaluation for all stages of the transition (particularly prior to and during the implementation stage) will guide the iterations of change.

Conclusions: The importance of program evaluation should be promoted. Priority areas for implementing CBME residency programs needs to be identified at each school, and within each program. Stakeholder perspectives should be incorporated when identifying priorities and developing strategies for the ongoing implementation of competency-based residency programs. The transition is resource intensive and it is key to look for opportunities for efficiencies and partnerships.

Workshop for directors of medical specialty programs: Design and implementation with international collaboration

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Introduction: To achieve a great residency program, it is essential to work on its design, covering topics such as teaching principles, evaluation, and strategies that favor the welfare and academic performance of residents. Therefore, a workshop was designed and implemented for directors of the medical residencies offered by the Multicenter Program of the Tecnológico de Monterrey in collaboration with the Royal College of Physicians and Surgeons of Canada.

Methods: Collaboration was established with the Royal College of Physicians and Surgeons of Canada and a workshop was designed for the program directors and deputy directors of medical residences of the different institutions that make up the multicenter residency program (Tec Salud, Metropolitan Hospital, Maternal and Children Regional Hospital, Psychiatric Hospital of Saltillo, and Hospital CIMA-Chihuahua). The workshop consisted of a previous activity and 2 sessions led by 2 international professors. We reviewed as a group the main roles and responsibilities, as well as leadership skills that a program director should have. Also, teachers were trained in the design of an effective evaluation and learning system.

Conclusions: In September 2018, a 2-day, 9-topic workshop was held. It was offered to 39 program directors and deputy directors of the different institutions of the multicenter residency program. Two international professors were in charge of guiding the sessions in which common problems were addressed within a residency program, strategies to solve them, and consolidate a large medical residency program. In the end positive feedback was received from the attendants.

Factors influencing program directors' effectiveness in residency education

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Introduction: Program directors (PDs) are important for educational quality in residency education. Earlier studies have shown that their work tasks are complex and include different components. However, factors that are influencing PDs' effectiveness in completing these tasks are unexplored. This study explores the experiences of factors that influence effectiveness of PDs in residency education.

Methods: We performed an exploratory qualitative study using semistructured face-to-face interviews with 17 PDs from different specialties at one university hospital and one teaching hospital in Sweden. Data were analyzed by qualitative content analysis.

Results: Four themes of factors influencing effectiveness were expressed by the participants: individual (being an expert, social competence); relational (support and cooperation, communication); attitudinal (shared vision, organizational values, colleagues' attitudes); and structural (organizational characteristics, regulations and guidelines, conditions for the role). The factors were experienced to influence effectiveness in a positive or a negative direction.

Conclusions: The factors experienced by PDs that have an impact on their effectiveness are complex and interrelated. To increase effectiveness of the role, and to consequently improve the quality in health care, management needs to develop a differentiated strategy that involves activities at both individual, group, and organizational levels.

Perceptions of the Medical Education Development Fund

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Introduction: In 2012, the Medical Education Development Program (MEDP) was created to support the creation of an academy of Southeastern Ontario Academic Medical Organization (SEAMO) physician educational leaders and scholars to develop and enhance skills in medical education, medical education scholarship, and research. This is the first evaluation of this program.

Methods: Data were collected through an online survey sent to all physicians on the SEAMO listserv. We received 51 completed responses to the survey. In addition, we invited all MEDP recipients, their department heads, and MEDP committee members to participate in semistructured interviews. Audio was transcribed by an independent transcriber and coded using NVivo.

Results: Harvard Macy courses or the Canadian Leadership Institute for Medical Education were the 2 most common reasons people applied for MEDP funds. Attainment of a master's or PhD in education were also listed as common reasons for applying. Most recipients said they would not have participated in these educational offerings without MEDP funds, and that being able to attend these courses has allowed them to approach education and research in new ways. Department heads of MEDP recipients identified the program as a way to support junior faculty interested in education leadership; however, the majority of interviewees said they would like more accountability attached to the funds in terms of concrete deliverables based on attended education opportunities.

Conclusions: Most respondents said they thought the MEDP was a good use of SEAMO funds and identified recipients as education resources in their departments.

Training academic advisors in competency-based medical education

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Introduction: With the implementation of competency-based medical education (CBME) and Competence By Design (CBD) at Queen's University, the role of the academic advisor (AA) has come under a new light. AAs review residents' raw data, synthesize the data, and deliver recommendations to the competence committee about progress and promotion. AAs play a pivotal role in supporting residents successfully navigate through CBME. Psychiatry at Queen's University has designed an innovative way to orient and train both academic advisors.

Methods: The AA workshop planning committee developed a faculty development workshop using practice-based and reflective components to optimize skill development and retention. In education, these methods of training are referred to as "experiential learning and discovery teaching." AA/resident pairs attend, learn new skills, and co-develop practices aimed at resident success. AAs and residents actively participate in live meetings and practice both the logistical aspects of CBME and coaching/analytical skills aimed at facilitating resident success. Participants are then encouraged to generate strategies for progress reporting and reflect on those strategies in a guided discussion.

Conclusions: We propose that an experiential, discovery method is an effective approach to AA training. This approach to teaching and learning allows the participants to be active in the learning and development process guided by common objectives. Workshop evaluations indicated that AAs felt the workshop was highly valuable and relevant to their role. Residents and faculty have reported feeling more comfortable with the process and more aware of the resources available to them.

Assessing relationship between clinical residents' educational achievement scores and their evaluation on faculty performance

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Introduction: Although one of the faculty's evaluation methods is based on students' viewpoints, several studies have criticized this method because it may be affected by the factors that are not related to faculty's educational performance. This study was carried out to assess the relationship between clinical residents' educational achievement scores and their evaluations on faculty performance in Mashhad University of Medical Sciences in Iran.

Methods: Residents' data from 6 departments including annual grading examination scores and their faculty evaluation scores were gathered from the archive of the medical school. Data were anonymous for the researchers. The relationship between annual grading scores of the residents and the evaluation score given by every resident to their faculty were assessed.

Results: In total, 4722 questionnaires from 258 residents were analyzed. Of them, 162 were female (62.8%) versus 69 male (37.2%). In sum, there was no significant correlation between annual grading examination score with faculty evaluation score. In terms of academic rank, the difference in the faculty evaluation score was not significant; however, in some items of 8-part evaluation, the scores were higher for associate professors. Considering the faculty gender, the difference in the evaluation scores was significant ($P \leq .05$).

Conclusions: Although there was no significant correlation between residents' academic achievement scores and their viewpoints on faculty's educational performance, it may be affected by some factors such as faculty's academic rank or gender. It seems the effect of other factors on residents' viewpoints on their faculty should be assessed for example reputation of the faculty.

Pediatric subspecialty teaching in a low-resource setting: When teaching becomes learning

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Introduction: The Mbarara University of Science and Technology (MUST), Uganda, and the University of Calgary (UofC) formed an education partnership to bolster subspecialty education of MUST general pediatric residents. Herein we report on the impact of participation on UofC faculty development.

Methods: In 5 pediatric subspecialty areas, UofC faculty designed a 2-week pediatric subspecialty curriculum that was delivered twice (2014–2018). UofC faculty met every 2 months over 18 months to reflect on their experience in an effort to improve the teaching partnership. UofC faculty completed a qualitative questionnaire within 2 weeks and a quantitative survey within 3 to 12 months of return to Canada.

Results: The UofC team developed a teaching philosophy that aimed at symbiotic learning where both teacher and students are learners. The emergent themes of valued experiences from the self-reflective survey included: (1) a re-evaluation of resource utilization; (2) a highly rewarding teaching experience; (3) clinically stimulating work; and (4) enriched cross-cultural competency. The mean scores (n =7) for impact on faculty development using a scale of 1 (no impact) to 5 (major impact) were as follows: breadth of clinical expertise (3.6), cross cultural communication (4.1), collaborator (4.1), understanding of patient/colleague diversity (3.9), and instructional/curriculum development (3.7).

Conclusions: Global health partnerships can provide an excellent avenue for faculty development. UofC faculty valued the learning experience and perceived that it contributed to their faculty development and anticipated a meaningful impact on their work back at home.

Point-of-care ultrasound for the diagnosis of testicular torsion: A resident education and quality improvement initiative

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Introduction: Scrotal doppler ultrasound (DUS) is an adjunct for the diagnosis of testicular torsion (TT) when clinical assessment is equivocal. Our group identified that acquiring a DUS results in a 48-minute delay. Point-of-care ultrasound (POCUS) may be used to negate this delay. The purpose of this study was to develop and evaluate a scrotal POCUS curriculum for urology and emergency medicine (EM) residents.

Methods: Experts from urology, EM, and radiology collaborated in the Delphi method to design a practical and didactic curriculum for scrotal POCUS. The study followed a pre-post design. The OASUS scale was used to evaluate for competency in scrotal POCUS skills. Residents were also asked to rate their comfort and confidence with scrotal POCUS before and after the curriculum.

Results: Twenty-four urology (n = 12) and EM (n = 12) residents participated in a scrotal POCUS curriculum. Pre-post testing showed significant improvements in knowledge (6.3 versus 8.0, $P < .001$) among the residents. Residents were more comfortable (pre 0.6 versus post 3.6, $P < .001$) and confident (pre 1.0 versus post 2.1, $P < .001$) utilizing scrotal POCUS to assess for TT after the curriculum (5-point Likert scale). Lastly, 23 out of the 24 residents were rated as competent at performing scrotal POCUS.

Conclusions: Our scrotal POCUS curriculum was effective and acceptable to both urology and EM residents. This skill may potentially reduce delays in diagnosing TT and improve testicular salvage rates.

Resident SOS: Responding to burnout and restoring resilience through a novel resource

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Introduction: Physician burnout peaks during residency, eroding new physicians' wellness. Despite this harmful endemic, programs and institutions are falling behind, though ideally we should be forming the frontlines, creating a culture that promotes well-being. The RESPITE initiative (Resilience in the Era of Sustainable Physicians: An International Training Endeavour) is a voluntary curriculum, founded by McMaster's psychiatry program, that works to lead this cultural shift.

Methods: RESPITE encompasses 3 components: an e-curriculum, peer-support rounds, and quarterly newsletters. The e-curriculum integrates 2 core learning dimensions: Know Yourself and Integrate New Lifestyles, which focus on building awareness and providing resilience tools. The rounds provide a confidential space for learners to debrief and process difficult topics related to life as a resident. The newsletters offer wellness strategies and serve as a reminder that physicians are not alone in their experiences of burnout.

Results: RESPITE is a pilot project, launched in 2019. The short- and medium-term educational goals are evaluated by outcome measures obtained for 12 months. Data are obtained through residents' engagement and feedback, and will be utilized to improve the initiative to address wellness needs, understand how best to engage learners, and determine the efficacy of the current methods aimed at improving resilience and well-being of the physician-in-training.

Conclusions: While further trial of RESPITE will determine its utility and role, this project has the potential to improve the quality of life for the resident physician and cultivate a systematic training model that is more attuned to the well-being and sustainability of its physicians.

Using quality improvement (QI) methodology to develop a standardized QI educational curriculum for internal medicine residents

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Introduction: Prior to 2017, core internal medicine residents at the University of Alberta did not have a standardized quality improvement (QI) educational curriculum. Our goal was to use QI principles to develop and implement a QI curriculum by providing internal medicine residents the Evidence-based Practice for Improving Quality (EPIQ) training course.

Methods: Two plan-do-study-act (PDSA) cycles, 1 year apart, consisted of EPIQ course delivery to postgraduate year 1 (PGY-1) to PGY-3 cohorts (110 residents–PDSA1) and then to the next PGY-1 cohort (27 residents–PDSA2). Residents were grouped into teams to work through a QI issue that was subsequently presented at an academic day for evaluation. Residents completed pre- and post-course surveys in PDSA1, as well as pre- and post-course tests in PDSA2, to evaluate knowledge acquisition and curriculum satisfaction.

Results: In PDSA1, 98% of residents felt they had acquired an understanding of QI principles (56% increase) and 94% of PGY-2 and PGY-3 residents preferred this method of learning QI to previous years. During PDSA2, test scores improved from 77.6% to 80%. One hundred percent of residents felt they had acquired an understanding of QI principles (76% increase).

Conclusions: Evaluations and verbal feedback from residents have been overwhelmingly positive. Developing a QI curriculum using validated QI tools highlighted areas of change opportunity enhancing change acceptance and sustainment, further supporting a QI culture within our hospitals and health care system. As more cycles of EPIQ are delivered and more residents become facilitators, it is our aim to have this curriculum sustained by future residents.

Providing evidence-based care, day and night: A quality improvement initiative to improve intensive care unit patient sleep quality

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Introduction: Evidence-based guidelines recommend promoting sleep in the intensive care unit (ICU), yet many patients experience poor sleep quality. We identified poor sleep quality for patients in the ICU at Kingston Health Sciences Centre (KHSC), measured by the Richards-Campbell Sleep Questionnaire (RCSQ). We aimed to improve ICU patient sleep quality from 53.7 to 70, measured by the RCSQ, by June 2019.

Methods: Patients included were > 18 years old, admitted to the KHSC ICU, with a Richards Agitation-Sedation Scale (RASS) \geq -2. The study followed an interrupted time-series framework of quality improvement. Root cause analysis utilized qualitative descriptive analysis. Two interventions were developed: inclusion of sleep quality discussion in morning nursing report and a patient doorway poster. The primary outcome measure was RCSQ score, measured by bedside nurse. Process measures included intervention adherence and quantitative measurements of light and sound intensity. Balancing measures included number of overnight codes as a marker for unrecognized clinical decompensation and nurse-reported sleep medication use.

Results: The initiative is ongoing at the time of abstract submission; significant improvements in RCSQ have not yet been appreciated. Baseline data collection (December 2018) revealed a mean RCSQ score of 53.7. Major local sleep barriers include nursing stigma associated with less actively managing a patient and delayed downgrading of patient illness severity.

Conclusions: Interventions targeted to improving sleep quality are ongoing. A rigorous root cause analysis has identified novel barriers to sleep promotion. This underscores the importance of understanding local culture in the design of quality improvement initiatives.

Improving the quality of pressure ulcer management in a long-term care facility

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Introduction: Pressure ulcers are a serious health care problem for residents in long-term care facilities and also a key quality metric for regulators of these facilities. Three initiatives were introduced at a 128-bed, long-term care facility to improve pressure ulcer prevention.

Methods: Firstly, a quality assurance and performance improvement project and a root cause analysis was conducted to improve the facility's wound care program. Secondly, a digital wound care management solution was adopted and implemented to track wound healing progression and management. Thirdly, the formation of the role a skin integrity coordinator was created to act as a central point of accountability for these wound care-related activities and related performance metrics.

Results: Improvements in pressure ulcer prevention were monitored using publically available quality metrics, as a regulatory requirement, specifically (1) the percentage of long-stay high-risk residents with pressure ulcers, and (2) the percentage of short-stay residents with pressure ulcers that are new or worsened. The pressure ulcer prevalence for long-stay high-risk residents was 12.9%, and upon implementation of these initiatives, the facility saw continued reductions in pressure ulcer prevalence to as low as 2.9% after 1 year, while pressure ulcers for short-stay residents were maintained at 0 throughout this period.

Conclusions: This study highlights the power of effective management combined with real-time data analytics, as enabled by the innovation of digital wound care management, to make significant improvements in the quality of health care delivery.

An innovative, light-touch approach to clinical change management in a tertiary-quaternary hospital emergency department

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Introduction: Translating clinical evidence into practice in critical care teaching environments is notoriously difficult, with the combined challenges of 24-hour rosters, frequent staff rotation, and high patient throughput impeding departments' ability to deliver consistent messaging or timely, targeted feedback.

Methods: We demonstrate a novel approach to implementation science in a busy emergency department in Queensland, Australia. Project aims were (1) to reduce intravenous (IV) prescription of metronidazole where oral administration would be appropriate, and (2) to reduce administration of aDT vaccinations to trauma victims where it was not indicated. Outcome measures include analysis of prescriptions, nursing time, expenditure on medications, and patient satisfaction. Our strategy involved 3 components: (1) implementation of a leading practice onboarding, orientation and change management mobile application; (2) an appreciative inquiry approach to clinical education; and (3) real-time automated analytics of department performance against set targets. In this model, the traditional phases of quality improvement and plan-do-study-act, can be undertaken simultaneously on an ongoing basis.

Results: Preliminary results from this ongoing trial (completed by May 2019) show excellent results, with a 21% shift from IV to oral administration of metronidazole within the first 10 weeks of the intervention, improved patient satisfaction as well as marked savings in nursing time and cost of medications.

Conclusions: Preliminary results suggest that this combination of content delivery through a mobile application, an appreciative inquiry approach to staff education, and real-time feedback of analytics is a highly effective and scalable approach to change management in tertiary critical care environments.

Magnetic resonance enterography—A single institution audit of referral compliance with appropriateness criteria

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Introduction: Diagnosis and follow-up of inflammatory bowel disease (IBD) in patients younger than 50 years of age is a widely accepted indication for magnetic resonance enterography (MRE). However, at our institution (St. Joseph's Healthcare Hamilton [SJH]), there has been a gradual increase in the average age of referred patients and in inappropriate indications such as anemia, diarrhea, and abdominal pain. The purpose of this quality assurance study was to determine the referral practices for MRE at SJH and to educate the referring physicians about the appropriateness of the test.

Methods: A total of 150 consecutive MRE examinations from July to October 2017 were retrospectively reviewed. The study date, patient age, clinical indication, and quality of the study were recorded. Indications were categorized based on the pathology in question. A repeat analysis was performed on 150 cases from July to November 2018 post-intervention. An educational letter was drafted to the top 20 referring clinicians to clarify the appropriateness criteria for MRE.

Results: A total of 52 patients (35%) were older than 50 years pre-intervention, compared to 32 (21%) post-intervention ($P < .05$). A total of 127 studies (85%) were related to IBD, compared to 117 studies (78%) post-intervention ($P > .05$).

Conclusions: The educational letter as the intervention led to desired reduction in the mean age of the referred patients for MRE. While the IBD-related indication rate was initially high, there was no significant increase post-intervention.

Integration of evidence-based practice and high-fidelity OSCE reduced major morbidity and mortality rate of contrast media allergy

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Introduction: The prevalence rate of contrast media (CMs) allergy decreased with the introduction of nonionic CMs and premedication for high-risk patients. Severe adverse reactions were 0.04% in the nonionic CMs examinations and death still occurred. One station regarding CMs allergy was implanted in the postgraduate year 1 (PGY-1) objective structured clinical examination (OSCE) from 2011 in Taichung Veterans General Hospital, and we identified a major gap in anaphylaxis recognition and management. A high-fidelity OSCE based on anaphylaxis guideline was then introduced to improve emergent medication administration and airway management.

Methods: Interprofessional high-fidelity OSCE content was developed through focus group discussion, which included ADR consultants, intensive care unit (ICU) physicians, and radiologists. Each trainee was assessed by 2 assessors with 3 major domains: anaphylaxis medication and airway management by senior physician and leadership by senior nurse. A debrief was conducted immediate after simulation. Residents who were classified as “need direct supervision” in overall performance had to attend an extended course. In-hospital CMs allergy was reported to ADR team and managed independently.

Results: Three hundred thirty-four PGY-1, 110 internal medicine residents, and 19 radiology residents attended the OSCE. Trainee satisfaction to course content was 93%. Radiology residents had better performance in identification of anaphylaxis than internal medicine residents in airway management. In 2016, 130 out of 15,029 patients had CMs allergy. Thirty-seven patients had anaphylaxis and 15 patients were admitted to the ICU. None of them died or had severe morbidity.

Conclusions: Integration of evidence-based practice and high-fidelity OSCE were effective in residents’ training and could reduce major morbidity and mortality rate of CMs allergy.

The value of data-capturing trainee trauma exposure in the Australian AOA 21 Training Program in orthopaedic surgery

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Introduction: The competency-based Australian Orthopaedic Association (AOA) 21 Training Program in orthopaedic surgery was launched in 2018. To support the program, an appropriate data collection model was required to ensure that trainees in each region receive a breadth of experience appropriate to their stage of training. The aim of this project was to assess the range and volume of the data collected by the AOA eLog, an online tool that allows trainees to log all procedures undertaken during each term.

Methods: eLog records of completed operative procedures for Australian orthopaedic surgery trainees entered into the AOA Trainee Information Management System (TIMS) between February and December 2018 were analyzed. Records were classified by state, hospital, training stage, service contribution, topic area, and procedure.

Results: A total of 73,465 completed eLog procedure records for 224 trainees were entered, and 38,655 (53%) were trauma-related. An average of 332 procedures per trainee were submitted; the lowest number for an individual trainee was 20, and the highest was 1056. Most procedures were conducted with the trainee serving as an assisting surgeon (39%), followed by operating surgeon with consultant scrubbed (24%), unsupervised (23%), and consultant present (10%). Only 4% of procedures involved the trainee teaching a colleague.

Conclusions: Substantial data are being collected on orthopaedic trainee exposure and service contribution through the AOA eLog. Initial analysis indicates that trainees do not frequently teach others, which should be addressed for trainees approaching completion. Further analysis is required to determine levels of exposure to certain procedures in each region and stage of training.

Evidence-based benchmarking in surgical performance: Leveraging the skill-outcome relationship in procedural assessment

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Introduction: Standards in procedural performance are necessary in competency-based medical education. Benchmarks based on patient outcomes adds important credibility for entrustability assessments. We build on a novel method of standard setting that leverages the predictive relationship between technical performance and postoperative outcomes.

Methods: We used a prospective database of robotic-assisted radical prostatectomy patients to set procedural standards in technical skill using our previously described methodology. Weighted, composite performance scores for each case were created based on the relationship between significant individual step scores and clinical outcomes of interest. Binary logistic regression was used to test the association between these composite variables and 2 clinical outcomes: early postoperative urinary continence and positive surgical margin.

Results: Our cohort included 91 RARP patients, with 31 surgeons and trainees contributing performance data. Significantly higher performance scores were seen across multiple operative steps in patients with early continent postoperatively, and lower scores in those with a positive surgical margin. Composite variables created using step-weighting were independently predictive of these outcomes. Using our novel standard-setting method, we created benchmarks for surgical performance, including standards for each step reflective of its weight. Finally, a user interface was designed to facilitate the use of this standard-setting technique for surgeons and educators.

Conclusions: This article proposes a novel standard-setting method for use in performance assessments of trainees and faculty surgeons. These benchmarks are invaluable for in-training evaluations of entrustability and can be incorporated into existing accreditation and privileging practices for surgeons.

Moving away from Cronbach's alpha: The RCPSC experience

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Introduction: While much of the psychometric world moved on from classical test theory to embrace Rasch modeling and item response theory in the 1980s and 1990s, certification boards with small cohorts of examinees were left with few options to estimating score reliability. Moreover, if norm-referenced reliability indices have benefited from wide-ranging research efforts, interest in criterion-referenced indices quickly dwindled after the 1970s. However, as stipulated in the 2014 *Standards*, criterion-referenced tests require criterion-referenced reliability indices. In this presentation, we address a transition from a norm-referenced reliability index to a criterion-referenced one.

Methods: Both Cronbach's alpha and Woodruff and Sawyer's theta were computed for the 24 RCPSC fall examinations with a minimum of 20 examinees. We looked at whether the indices met their acceptable thresholds, and to what extent they provided useful information on reliability given the nature of the examination.

Results: As expected, because Cronbach's alpha is norm-referenced and depends highly on score variance, its value was consistently lower than theta, a coefficient of agreement for pass/fail decisions. Alpha's value failed to meet the 0.80 acceptability criterion in 14 out of 24 cases, whereas theta was below its 0.85 acceptability threshold in only 1 case. In all the cases where theta was acceptable but alpha was not, we could establish that cohort homogeneity and item score format would have significantly attenuated inter-item correlations without affecting examinee classification consistency.

Conclusions: We concluded that theta was both more conceptually appropriate and empirically accurate than Cronbach's alpha as a reliability estimate.

Introducing learning analytics for national milestones data: Impetus for change at the national specialty level

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Introduction: Accreditation systems that have embraced a competency-based approach increasingly rely on analysis of outcomes data at the level of the learner, or learning analytics. Specialty societies can be effective partners in interpreting these data to effect curricular change at the national level. While early studies of milestones data suggested how they might be useful to program directors for local curriculum improvement, there have been no reports of cooperative analysis between a national accreditation body and national stakeholders for systems-level change.

Methods: Accreditation Council for Graduate Medical Education (ACGME) Level 4 Milestones represent substantial fulfillment of residency training, but are not mandated as a graduation requirement. This allows for meaningful variance in patterns of data, a key requirement for learning analytics. We analyzed national milestone ratings for over 1300 neurological surgery residents from 2013–2016. These (aggregate) data were then presented to the ACGME Residency Review Committee for accreditation and the Society of Neurological Surgeons, representing academic department chairs and residency directors, for interpretation (ie, “co-creation” of meaning). We then followed up with these stakeholders 2 years later to examine what changes they had made, and found evidence consistent with changes in the curriculum at the national level.

Conclusions: These data helped educational leaders in neurological surgery confirm which subspecialty areas were within “core” training and which were not. Partly in response to these data, they revised their milestones, impacting national curricular expectations. Working in partnership with specialty stakeholders, we were able to assist in creating meaningful educational change at the national level regarding standards of training.

Assessment that matters for patients: Positive association between entrustment decisions and quality care measures for residents caring for patients with asthma

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Introduction: The entrustment construct for assessment places the patient at its core. However, whether entrustment decisions are related to quality care is not known. This study sought to determine the association between entrustment decisions made about pediatric residents and quality measures for their patient encounters.

Methods: During the 2016–2017 academic year, we obtained the following for encounters of patients presenting with asthma exacerbation to the Cincinnati Children's Hospital pediatric emergency department: (1) 6-question resident entrustment score based on Chen's supervision scale and Kennedy's trustworthiness construct (6-item total score: 0–6), and (2) resident quality measure score (proportion of 21 quality measures achieved). Supervising faculty and fellows completed the entrustment questions for each encounter. Quality measures were developed through expert consensus to meet 2 criteria (importance to asthma care and likelihood the resident, and not another team member, completes the measure) and were manually extracted from the electronic health record. To account for nested data within residents, association of entrustment with quality was evaluated using mixed models adjusting for patient acuity and complexity.

Results: Fifty-nine residents provided care for 110 unique patients. Entrustment scores exhibited a significant positive linear relationship with quality scores ($P = .04$), with entrustment scores increasing by 0.16 (95% CI 0.01–0.31) for every 0.10 increase in quality.

Conclusions: This study demonstrates a statistically significant association between resident performance assessments and resident care quality. This offers initial validity evidence for the use of entrustment decisions as well as quality measures as resident performance assessment frameworks.

Using data visualization to monitor resident learning progress in a CBME curriculum

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Introduction: The 2018 implementation of competency-based medical education (CBME) at the University of Toronto included 15 Royal College programs and over 150 residents on a single electronic platform for the collection of entrustable professional activity (EPA) assessments at 6 teaching sites. In order to manage large volumes of quantitative and qualitative assessment data, postgraduate medical education developed a pilot project on the use of standardized data visualization tools to support evidence-based decision-making on resident performance.

Methods: Over 4600 individual EPA assessments from July 4, 2018 to February 2019 were extracted from the Elentra online platform for CBME. Prototype dashboard designs were created in Tableau, a data visualization software, based on a consultative process, for each of the residency program competency committees. Interactive dashboards compared individual resident performance by EPA entrustment, case complexity, teaching site, and type of assessor to both targets and mean performance indicators.

Results: Data dashboards of resident performance have been developed for 2 cycles of competency committee decisions. Early feedback is positive with programs and competency committees using learning analytics to inform resident progress decisions.

Conclusions: Large volumes of data necessitate efficient yet valid methods to observe and understand resident progress in a CBME curriculum. To date, the use of Tableau for data visualization is a helpful and important tool to inform decision support. As learning analytics is a new science for medical education, more research is required to ensure data validity and explore other uses including program evaluation.

Informing promotion decisions: Designing assessment reports for clinical competency committees using Messick's validity framework

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Introduction: Entrustable professional activities (EPAs) are assessed through instruments that produce both quantitative and qualitative data. Promotion decisions require group decision-making by clinical competency committees (CCCs). The volume of raw assessment data may be too great for CCCs to review in its entirety for each promotion decision. To facilitate interpretation, data must be collated, analyzed, and displayed in reports that facilitate decision-making. This study seeks to understand how assessment data can be reported to support CCCs in making valid promotion decisions.

Methods: Using a design-based research methodology, template assessment reports were developed using Messick's validity framework. Mock reports were created to represent well-performing, borderline, and poorly performing residents. Through semistructured individual interviews, reports were presented to 10 CCC members from 2 training programs at the University of Toronto. Interviews sought to understand how CCC members interact with reports and identify which elements are used to support valid promotion decisions. Data were analyzed using a framework analysis using Messick's validity framework.

Results: Reports designed using Messick's validity framework provide CCC members with evidence to support promotion decisions. While analysis is ongoing, data from 5 interviews indicate that CCC members use contextual information and ensure narrative comments are congruent with numerical scores. Detailed analyses from the complete dataset will be presented to provide insights into how CCC members interpret validity evidence and help inform valid report design.

Conclusions: Results from this study will inform development of assessment reports and contribute to understanding of how CCCs use validity evidence to support promotion decisions.

Resident burnout on internal medicine wards: Associated risk factors and performance outcomes

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Introduction: Although burnout is well described within residency training programs, little is known about the independent impact of work-intensive rotations. We aimed to determine the pre- and post-rotation prevalence of burnout, associated performance outcomes, and predictors of resilience on internal medicine inpatient rotations.

Methods: Web surveys were distributed to residents ($n = 226$) completing inpatient internal medicine ward rotations at 3 academic-affiliated hospitals before and after 4-week rotations between April 2018 and September 2018. Burnout was assessed with the Maslach Burnout Inventory–Human Services Scale, and performance outcomes were quantified on 5-point Likert scales. Multivariable stepwise logistic regression was used to calculate odds ratios.

Results: We achieved a response rate of 78%. Burnout prevalence increased after rotation completion (54% versus 70%, $P < .001$). Post-rotation burnout was associated with poorer self-reported clinical outcomes (suboptimal discharges, treatment errors, avoiding patient/family updates); professional attitudes (avoiding patients/families, allied health conflicts, consulting service conflicts, patient death insensitivity, inattention to patient illness); team supportiveness (reduced attending and senior resident support); and perceived importance of assigned responsibilities (increased “scut,” reduced learning emphasis). All results were $P < .005$. New onset burnout was associated with doing more “scut” work (OR 2.9) and experiencing less emphasis on learning (OR 2.9) compared to those who demonstrated resilience. Demographic factors did not predict resiliency.

Conclusions: Completion of inpatient internal medicine ward rotations leads to an increase in resident burnout, and may adversely affect patient-related outcomes and professional behaviors. Transient periods of reduced resident wellness may be a window of opportunity to implement resiliency-promoting interventions.

Finding joy and meaning in medicine: Gratitude rounds for pediatric residents

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Introduction: The prevalence of resident burnout and distress is well-documented. Residency may represent the nadir of a physician's personal wellness. Most of our program's wellness initiatives have focused on ameliorating the challenges of residency. What we feel is lacking is attention to the meaning and joy in the practice of medicine. We aimed to address this with gratitude rounds. The literature on practicing gratitude has shown it to be positively correlated with measures of well-being. We see finding joy in medicine as both protective against burnout and fundamental to helping physicians tend to their own well-being. This is central to the CanMEDS professional role.

Methods: Gratitude rounds occur monthly on the clinical teaching unit (CTU). CTU attending physicians and residents on service are invited to participate in a facilitated, hour-long discussion over lunch time. Refreshments are served. A facilitator guide with sample questions has been created to allow for any interested staff to lead discussion. Anonymous evaluations are sent electronically to residents who participate.

Conclusions: We have had excellent attendance and engagement in rounds. Resident feedback has been extremely positive—acknowledging the benefit of finding joy in work, connecting over meaningful patient interactions, and promoting collegiality. Gratitude rounds address a gap in the current resident wellness programming and could easily be adapted by other programs. The practice of gratitude is a skill. Gratitude rounds help residents develop this skill and carry it through their training, and beyond.

Exploring the wellness needs of pediatric residents: An appreciative inquiry approach

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Introduction: It has been established that residents face high rates of burnout and depression. Evidence is limited regarding the impact of interventions. Many current interventions focus on developing resilience on an individual basis and do not factor in the specific contexts. The objective of this study was to assess wellness needs of pediatric medicine trainees at the University of Toronto.

Methods: A needs assessment of current trainees was conducted utilizing an appreciative inquiry approach, a qualitative method aimed at understanding transformational change from a positive light. Qualitative responses were collected electronically. Responses were coded by 3 members of the project team and themes were identified.

Results: Thirty-two of 86 residents (37%) completed the survey. Respondents described feeling most supported by individual relationships, but expressed interest in further opportunities to share experiences in structured settings. Participants reported wanting to feel challenged but supported in their learning, and identified qualities of an ideal learning environment. Participants also shared that they would like an opportunity to meet their basic needs both at work and in their lives, including physical health and mental health. Finally, participants envisioned a positive shift in the culture of medicine that would help mitigate the demands imposed by the structure of the learning environment.

Conclusions: This project highlights key areas, beyond individual resilience, to target in the development of wellness programming and underlines the need for structural and cultural change in medical training and learning environments to support the well-being of pediatric medicine trainees in their local environment.

Enhancing teacher wellness through mindfulness-based stress reduction and mentoring skills training for teachers

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Introduction: Playing multiple roles as clinical teacher is stressful. Mentoring skill is one of the most stressful factors especially when supervising a difficult trainee. We sought to develop a program to meet faculty needs and retrieve resilience.

Methods: We conducted a 1-day offsite workshop with 2 topics: (1) mindfulness-based stress reduction (MBSR), and (2) mentoring strategies and tools for a difficult trainee. Forty clinical teachers from various specialties were assigned into 6 different groups; 92.5% are clinical teachers and 4 of them are playing 3 roles as clinical teacher, program supervisor, and program director at the same time. Only 30% of participants have used MBSR or a resilience program, and 40% received mentoring training before.

Results: Through using a pre- and post-session questionnaire, teacher's self-confidence in mentoring skills have increased dramatically in identifying related issues for a difficult trainee and obtaining the communication skills with trainee's other stakeholders. Participants 100% agreed the workshop could help their resilience and understand the role and responsibilities as a mentor. Surprisingly, teacher's wellness was recognized after this whole-day interactive mentorship. Providing further MBSR training (25.7%), resilience programs (21.1%), or simulated situation for mentoring training (19.3%) were strongly suggested to sustain teacher's wellness and enhance mentor efficacy.

Conclusions: We found MBSR training gave clinical teachers a chance to understand stress management and obtain resilience, coupled with mentor skills and interactive mentorships were the key for teacher's wellness. Systemic approach to provide a wide variety of faculty development programs, including MBSR, mentoring skills, and mentorships, is mandatory to enhance teachers' wellness.

“Is it the system or is it me?”: Exploring stories that physicians and trainees write about flaws with the “system”

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Introduction: Physician burnout and wellness is a concern for the medical profession. Research has highlighted the role that workplace culture and environment play in developing burnout. Given the pervasiveness of burnout among physicians and trainees, we aimed to understand their perceptions of the ways in which the culture and practices of medicine may contribute to stress, dissatisfaction, and disengagement.

Methods: We reviewed all reflective narratives published in 4 major medical journals (*NEJM*, *JAMA*, *CMAJ*, *Annals IM*) between January 2015 and December 2017 (n = 130). By consensus, we identified those that addressed “system” flaws (n = 87). Using content and narrative analysis, we analyzed the types of flaws, narrative strategies, and physicians’ orientation to the flawed system.

Results: Many stories pointed to medical culture as flawed (n = 60), focusing on issues of communication, education, pace, stigma, and health advocacy. Less frequently, physicians’ narratives discussed resource limitations and disparities as well as rigid institutional practices. Narratives about medical education specifically (n = 13) problematized the discordance between the content and values communicated through the formal versus hidden curricula, highlighting a disconnect between how patient-centered care is taught and enacted. These narratives also demonstrated how cultural norms (eg, perfectionism, stoicism, hierarchies) and the frenzied pace of training inhibit resident and trainee wellness. Narrators positioned themselves as agents of collective or individual change in the education system.

Conclusions: Physicians’ narratives offer insight into how the culture and practices of medicine and medical education may impact their sense of professional fulfilment and ability to meaningfully enact the values underpinning the profession.

The evolution of moral distress and burnout during pediatric residency: A longitudinal assessment

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Introduction: In pediatrics, nearly 40% of residents report burnout (Baer, 2017). It is not known whether moral distress and burnout evolve during residency, and whether demographic characteristics modify this evolution. This study examined the temporal course of moral distress and burnout in pediatric residents.

Methods: Eighty-six of 101 pediatric residents from postgraduate year 1 (PGY-1) to PGY-4 completed the Moral Distress Scale–Revised thrice yearly and Maslach Burnout Inventory annually, from July 2016 to October 2018. Residents were assigned a unique identifier so that their responses could be tracked longitudinally. We used longitudinal mixed effect modeling and generalized estimating equations to account for clustering of data.

Results: Although the average moral distress score was relatively low (20 of a possible maximum of 336), 10% of respondents stated that they considered quitting residency in the past due to moral distress but did not leave. There was evidence to suggest that propensity to consider leaving a position due to moral distress did differ as a function of residency cohort over time, and in one cohort, that propensity was higher during the winter of PGY-2. A total of 7.1% of pediatric respondents were classified as burned out. Although rates of burnout did not differ as a function of residency cohort over time, burnout did increase in one cohort between PGY-1 and PGY-2; this finding was explained by a decrease in personal accomplishment.

Conclusions: Although average moral distress is low in pediatric residents, this distress contributes to potential attrition. The first 2 years of residency are associated with the highest moral distress scores and prevalence of burnout.

Grit, resilience, and professional quality of life: Investigating wellness in medical education

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Introduction: A shifting focus in medical education is aimed at promoting the health and wellness of physicians in Canada. Grit, resilience, and professional quality of life (PQoL) have been shown to be indicators of wellness. The purpose of this project was to explore the relationship between grit, resilience, and PQoL, along with various subgroup demographics, in medical students and residents.

Methods: Four hundred twenty-eight participants (349 from postgraduate medical education, 79 from undergraduate medical education) filled out an online survey. Linear regression was used to compare relationships between resiliency and PQoL (compassion satisfaction [CS], burnout, secondary traumatic stress [STS]) and grit across various subgroups (gender, age, program level). Multiple regressions were performed to explore the effects of grit and PQoL components on resiliency.

Results: A significant positive relationship between resilience and grit with CS was observed ($ps < .05$). An inverse relationship between resiliency and grit with burnout and STS also emerged; however, the relationship between resilience and STS was only true for women, younger participants, residents, and those in excellent health. Multiple regression revealed components of grit and CS as significant contributors to resilience ($ps < .001$).

Conclusions: Grit and resilience appear to be very pertinent constructs related to one's ability to handle setbacks, negative feedback, and other obstacles in health professionals' education and careers. Understanding the relationship between grit, resilience, and wellness is essential in fostering well-being in medical students and residents.

Residents' wellness program: Orientation, mental health counseling, and support resources

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Introduction: The purpose of the Tecnológico de Monterrey School of Medicine Residents' Wellness Program (RWP), unique in Mexico, is to improve residents' well-being and its relationship with professionalism; strategies were designed and implemented for first-year residents.

Methods: In March 2018, an orientation session for the RWP was offered to residents entering 16 programs. During the semester, these were implemented: (1) well-being and self-care workshops, (2) suicide prevention certification, and (3) clinical ethics course sessions for well-being and professionalism.

Results: Seventy-five medical residents entering the 16 programs participated at the orientation divided in 4 sections: (1) introduction to RWP; (2) counseling; (3) basic mental health assessment, with the following applied: Beck Anxiety Inventory, Beck Depression Inventory, and projective testing; and (4) substance abuse prevention. Residents were offered to schedule one-on-one counseling meetings with the school's psychologist: 47 (62%) were willing to do it, 26 (35%) were not, and 2 (3%) did not respond. These were implemented: (1) workshops: fatigue and stress management, personal strengths, and vulnerability factors; (2) QPR (question, persuade, refer): gatekeeper for suicide prevention; and (3) clinical ethics sessions. The main RWP objectives, support services, and resources were reviewed individually and in group.

Conclusions: After completing orientation, residents were offered to schedule one-on-one meetings with the school's psychologist to complete the initial mental health evaluation and address their professional, emotional, physical, and social wellness concerns. They come up with a plan and schedule follow-up meetings. If needed, the counselor will refer the resident to the corresponding department.

Outside the comfort zone: Evaluation of a simulation-based curriculum in managing agitated patients for pediatric residents

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Introduction: Pediatricians must possess competence in the management of acute psychiatric emergencies, including agitation. Limited studies exist to inform effective methods of training pediatric residents in acquiring these skills. This study assesses the effect of a simulation-based workshop on the knowledge, competence, and confidence of pediatric trainees in the management of agitation.

Methods: This was a prospective comparative cohort study. Pediatric residents were divided among 3 study groups: (1) a 1-hour didactic lecture ($n = 30$); (2) a simulation-based workshop ($n = 7$); and (3) no intervention ($n = 47$). Confidence and knowledge were assessed in groups 1 and 2 using a pre- and post-intervention self-efficacy questionnaire and a clinical vignette. All groups completed an agitation scenario in an in-training objective structured clinical examination (OSCE). Univariate analysis was completed on the pre- and post-intervention questionnaires. Clinical vignette scores were analyzed using a t test. Analysis of variance was used to compare OSCE scores between groups.

Results: Simulation-based workshop participants performed better in the OSCE scenario as demonstrated by their OSCE score (mean 81.7%, 95% CI 75.1–88.3) compared to those from group 1 (mean 74.6%, 95% CI 71.4–77.8) and group 3 (mean 71.6%, 95% CI 69.2–74.0). The most significant effect was seen between groups 2 and 3 ($P = .0055$). No difference in mean OSCE scores was found between groups 1 and 3 ($P = .14$). Subgroup analysis of OSCE scores by postgraduate year of training did not show improvement with increased level of training.

Conclusions: Simulation-based learning may be an effective educational strategy for pediatric residents to acquire skills in managing acute agitation.

Simulation on the design and management of a medical clinic

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Introduction: Under the present conditions of the Quebec health care system, the majority of physicians will practice in a community clinic. Considering the lack of fundamental business and leadership training in undergraduate medical education, we created a simulation activity for medical students and residents. We focused on key stages in the drafting of a business plan and our objectives were to allow students and residents to practice communication, negotiation, and collaboration skills.

Methods: Three editions of the simulation have taken place over a weekend where 80 participants in teams of 4 were invited to build their own medical clinic using computer software. The collected data were integrated into the simulation software to assess many parameters including the number of patients seen in their clinic in a year. Throughout the simulation, participants had access to professionals such as physicians, lawyers, tax experts, and notaries to guide their decision-making. The simulation consisted of 7 steps: (1) mission, vision, and values; (2) location; (3) contracts; (4) organization of the workspace; (5) scheduling; (6) human resources; and (7) budget. Participants then prepared a 5-minute presentation that was evaluated by physicians based on the following criteria: creativity, leadership, management skills, and efficiency.

Conclusions: This is the first simulation that aims at teaching an understanding of the complex nature of establishing a community clinic in Quebec. During the 2019 edition, we used a focus group and validated questionnaire to evaluate whether participation may have an impact on the understanding of administrative aspects of medical careers, on student and resident attitudes toward clinic development, and ultimately, inspiring strong physician leadership with the goal of maximizing quality of care.

Simulations for high-stakes leadership skills development

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Introduction: There is no current standardized curricula for leadership development to fulfill the CanMEDS 2015 leader role for Canadian residents. A key challenge when situating leadership training within a competency-based framework lies in providing sufficient experiential opportunities for all trainees. The Leadership Education for Advancing Practice Simulation course (LEAP-S) at the University of Toronto Department of Psychiatry has been designed to fill gaps in the existing curriculum. A pilot has been implemented and evaluation is ongoing.

Methods: A targeted needs assessment identified gaps and themes in leadership education that could be taught via simulations. Faculty members, simulation experts, and residents collaborated to develop a daylong simulation course for leadership skills. Six practice-based scenarios were developed and simulated from identified themes: effective teamwork, management of complaints and conflict, and medical errors disclosure. Ten postgraduate year 4 residents participated in the pilot with 2 facilitators and simulated participants. A mixed qualitative and quantitative analysis approach is being used to explore both process and outcome dimensions related to leadership development grounded on Moore's Expanded Outcomes framework.

Results: Preliminary results reveal that 75% agree and 25% strongly agree with an increase in knowledge (n = 8), and 100% of the participants agree or strongly agree that they were satisfied with the course (n = 9). Eight of 9 participants (80%) report an intent to change practice as a result of the course. One participant reported that "no, it is already embedded in practice."

Conclusions: Based on the preliminary results, participants found the day valuable, with an intention to change practice.

Evidence-based medicine simulation: Teaching real-time point-of-care literature searching to emergency medicine residents using a flipped classroom and high-fidelity simulation

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Introduction: Evidence-based medicine (EBM) and literature searching skills are competencies within the emergency medicine (EM) residency curriculum. Traditionally, literature searching was a classroom-based overview of search engines taught by a librarian. Learners reported low engagement and poor retention. To improve engagement, interest, and skill retention, we used a novel approach: simulation to teach real-time literature searching.

Methods: Based on a needs assessment of our EM residents, we created a literature searching workshop using a flipped classroom approach and high-fidelity simulation. Goals of the small group session (12 junior residents) were: be interactive, engaging, and practice-relevant. With a librarian, we developed a brief list of EM-relevant databases, tips for searching, and links to the corresponding sites/apps. Pre-readings also covered the hierarchy of evidence and formulating a good clinical (PICO) question. The high-fidelity simulation involved a stable patient whose management required a literature search. Feedback was collected on the simulation experience.

Results: Students received the list of EM-relevant databases 7 days prior and were instructed to set up the resources on their smartphones. One volunteer led the simulation; all residents participated in the search on their smartphones. Collectively, it took 5 minutes to find a study that adequately addressed the clinical question. Feedback on the simulation was positive. Students found it “. . . engaging, practical, and realistic.” It helped residents learn to efficiently search the literature while managing a stable patient.

Conclusions: A flipped classroom simulation-based teaching strategy made learning literature searching more interesting, engaging, and applicable to EM practice.

Are basic robotic surgical skills transferable from the simulator to the operating room? A randomized double-blinded prospective educational study

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Introduction: Several robotic simulators have been shown to improve basic robotic skills. However, none showed transferability to the operating room. The aim of this study was to assess the transferability of basic robotic skills from the da Vinci Surgical Skills Simulator to the operating room.

Methods: Fourteen robotic-naïve urology residents were randomized to 2 groups: group A practiced 3 sessions on the simulator, while group B practiced until reaching a benchmark set by 5 experts as defined by the Norm-referenced method. All experts and residents performances were recorded on the simulator. Followed by recording bladder mobilization and urethrovesical anastomosis during robotic prostatectomy. Recordings were assessed blindly using the validated GEARS tool using C-SATS. Wilcoxon rank sum test and Spearman's correlation coefficient (ρ) were used in our statistical analysis.

Results: In the operating room, there were no differences in total GEARS scores between both groups. GEARS efficiency component during "energy & dissection" task on the simulator correlated with GEARS efficiency component during bladder mobilization in the operating room ($\rho = 0.62$, $P = .03$). GEARS force sensitivity score during "ring & rail" and "dots & needles" tasks on the simulator correlated with GEARS force sensitivity score during bladder mobilization ($\rho = 0.58$, $P = .047$; $\rho = 0.65$, $P = .02$, respectively). Total GEARS scores for "ring & rail" and "suture sponge" tasks correlated with the total GEARS scores during anastomosis ($\rho = 0.86$, $P = .007$) and ($\rho = 0.90$, $P = .002$).

Conclusions: Objective blinded assessment of simulator tasks correlated well with objective blinded assessment of bladder mobilization and anastomosis during robotic prostatectomy. Therefore, competency in basic robotic skills could be transferred from the simulator to the operating room.

Multi-source feedback during simulated resuscitation scenarios: A qualitative analysis

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Introduction: The implementation of competency-based medical education requires increased feedback based on direct observation, but this can be challenging for rare events such as resuscitation cases. Simulation provides an environment where such rare events can be practiced and observed. We sought to explore the qualitative differences between assessments of residents provided by nurses, co-residents, and attending physicians within a simulation-based training course focused on resuscitation.

Methods: The simulation-based course consisted of 12 resuscitation cases and was completed by 87 first-year residents from 14 specialties at 2 Canadian institutions. Faculty, co-resident participants, and a nurse completed narrative assessments after each case. All qualitative comments were analyzed using an emergent thematic approach through open coding using NVivo software.

Results: Residents' communication skills were frequently discussed among faculty, peers, and nurses. Faculty provided positive comments on diagnostic actions and constructive feedback regarding administering medication and remembering dosages. Peers focused on providing positive and constructive comments on leadership skills, including the ability to delegate tasks and the extent to which the leader accepted suggestions from team members. Nurses provided a mixture of feedback on initial assessment and interventions.

Conclusions: Our analyses demonstrate that assessors from differing backgrounds focus on different aspects of resident performance. This suggests that although alternative assessors such as co-residents and nurses are often present at rare events such as resuscitation cases, they do not provide the same feedback. Future work could investigate how multi-source feedback could be integrated to provide a holistic picture of resident performance.

Training in Professional Skills (TIPS): The creation and evolution of a simulation-based non-technical skills course for trainee surgeons in Australia and New Zealand

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Introduction: Simulation, human factors, and clinician-educator perspectives led to the Australian Governments and the Australian Society for Simulation in Healthcare funding the development and delivery of a pilot course in 2009 using simulation, which addressed so-called “non-technical” and professional skills development in surgical trainees. The core tenets of the course are: (1) Extension: Affirmation and extension of effective professional behaviors; (2) Integration: safe technical and non-technical skills are mutually dependent and should therefore be taught in an integrated fashion, and every effort should be made to integrate the learning experience with clinical practice; (3) Experience: trainees participate in simulation scenarios as well as actively observe their colleagues in simulated tasks; and (4) Reflection: based on a feedback-reflection-experience cycle, participants are encouraged to use reflection and feedback to maximize learning from the immersive scenarios (a means to an end) and promote the development of sophisticated feedback skills for future application (an end in itself).

Methods: The 2-day Training in Professional Skills (TIPS) course provides authentic and immersive scenarios, based on collaborative development processes between educators and surgeons, that cover patient-centered communication, ethical decision-making, informed consent, error disclosure, communicating while operating, end-of-life discussions, communicating in teams, conflict resolution, team task challenges, and situation awareness. Debriefing after each interaction focuses on communication, incorporating participant observers and actors, and follows an Advocacy-Inquiry approach. Facilitators and discussion formats linking learning in the course and clinical practice.

Results: TIPS has evolved over 57 courses delivered to approximately 650 junior physicians in Australasia. Participant evaluations demonstrate high relevance and value.

Conclusions: The TIPS course provides a crucial addition to the expanding area of professional skills training and assessment for surgical trainees.

Resident perspectives on feedback, impression management, coaching, and mindset in residency training: A qualitative study

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Introduction: Feedback is critical in physician growth; research on coaching in medical education suggests tension with formal assessments within the competency-based medical education (CBME) model. Using Goffman's theory of impression management, we explored residents' perspectives on receiving feedback during residency training.

Methods: We conducted semistructured interviews with 15 internal medicine residents (5 postgraduate year 1 [PGY-1], 5 PGY-2, and 5 PGY-3). Data collection and analysis were conducted simultaneously. Guided by constructivist grounded theory, we applied open codes, wrote analytic memos, and discussed themes and relations between themes regarding feedback. Using constant comparison, we refined our categorization of themes within Goffman's theory of impression management and Dweck's mindset theory. Theoretical saturation was determined by group consensus.

Results: Residents identified that formal assessment affected mindset and impression management during residency due to perceptions of permanence and future consequences of negative assessments. With constant formal assessment, residents adopted a fixed mindset and staged a performance that concealed opportunities for growth. Formal assessment hindered coaching relationships. Building relationships with faculty members generated trust with the faculty. This enabled residents to adopt a growth mindset and stage a performance that revealed opportunities for growth and provided opportunity for meaningful feedback.

Conclusions: The formal assessment process can alter the context of feedback, affect residents' mindsets, and alter their ability to disclose weaknesses. Relationship-building can mitigate the effect of formal assessment, promote growth mindset, and foster residents' professional development. The role of formal assessment should be further evaluated to optimize its role in residency education.

En route to CBME: Exploring how coaching can be optimized in the surgical environment

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Introduction: Surgical coaching is seen as a central component of competency-based medical education (CBME) that can help residents integrate feedback into their training and guide their development across the learning continuum. However, there are many divergent opinions on what “coaching” actually means. In the present study, we explored current perceptions of coaching among surgical staff and residents.

Methods: Ten staff and 6 residents were interviewed. Questions explored current learning activities, perceptions of coaching, and the utility of coaching-related activities. Interviews were transcribed verbatim and analyzed using thematic analysis.

Results: Coaching definitions were inconsistent. Some participants conflated mentoring with coaching; many reported narrow, specific, yet divergent definitions. Most participants deviated from fundamental definitions of coaching from the literature; many reported that basic tenets such as learner-directed goals and longitudinal rapport were absent from most of the coaching activities in which they participated. There was a consensus that time, willingness, and commitment are significant barriers to surgical coaching.

Conclusions: For coaching to be successful in the surgical environment, there needs to be a clear, common definition, and activities must be aligned with this definition. Effectiveness requires collaboration between staff and residents, and a willingness from both to engage in coaching practices. Recent implementations of surgical coaching have focused on the Briefing-Intraoperative teaching-Debriefing (BID) model. Our data suggest that this model is currently insufficient and lacks key components, such as longitudinal rapport between staff/resident pairings, which highly limit its effectiveness. Future work will test the efficacy of an extension to the BID model.

Perceptions of assessment and feedback: Hawks, doves, and impact on learning

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Introduction: Residency training takes place in a workplace learning environment. Residents may work with several supervisors over the course of their training. Each may have a different approach to feedback and may deliver different assessments for the same quality of performance. Our research question is: Among residents who receive regular feedback how do different styles of feedback by supervisors impact the residents' learning?

Methods: A qualitative methodology was used. Participants were residents from programs that have routine one-on-one feedback and assessment. In depth, semistructured one-on-one interviews were conducted. These were transcribed, reviewed, and coded. Participants were University of Toronto and McMaster University residents. Sample size will be determined by thematic saturation and data collection is ongoing. The interview guide was updated in an iterative fashion to further explore themes generated in the initial interviews.

Results: Analysis of the first 6 participants revealed 5 themes: Remembering feedback that generated a strong emotional response; reflection on feedback as a component of use for learning; reconciling feedback received that was in conflict with previous feedback; relationship with the individual providing feedback impacted interpretation; and feedback was parsed by residents to determine the rationale of the assessor.

Conclusions: How residents use feedback to further their learning is variable. This study identifies that styles of feedback, emotional response, and relationship with the provider are all contributors to learning after receiving feedback. The individuality of responses to feedback are important for trainee self-reflection, faculty development, and training programs that facilitate trainee-supervisor interactions.

Learning conversations: An analysis of theoretical roots and their manifestations in feedback and debriefing

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Introduction: Experiential models of learning often depend on experience-informed dialogues such as feedback and debriefing. Efforts to understand each have largely been independent of each other, potentially splitting them into unnecessary and potentially problematic factions. Given their shared purpose, we asked whether efforts to understand these post-experience dialogues are, for theoretical and pragmatic reasons, best advanced by keeping these concepts unique, or if some unifying conceptual framework could better support educational contributions and advancements.

Methods: Our intention was to identify seminal works and foundational conceptual features to comprise a coherent purposeful review and analysis exploring theoretical roots and their manifestations. We extracted conceptual and theoretical details and considered these within and across strategies. We traced their developmental paths, searching for underlying and foundational conceptual approaches and theoretical similarities and differences.

Results: Our findings suggest that each was derived from distinct theoretical roots, leading to variations in how they have been structured. Both draw on multiple (many similar) educational theories, positioning themselves as ways of operationalizing those theories; considerable commonality between traditions now exists, with both leveraging cognitive and social theories; and there may be room to merge these educational strategies as *learning conversations*, in part because they may be conceptually consistent.

Conclusions: Despite distinct theoretical roots, it appears theoretical orientations are now overlapping with both, drawing on and positioning themselves within overlapping educational and social cognitive theories. This is leading to and evidenced by overlapping structural techniques in what is valued and considered necessary for achieving educational goals.

Mentoring program for medical residents: Faculty development program for mentors

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Introduction: The purpose of Tecnológico de Monterrey School of Medicine's Mentoring Program is to implement an initiative to improve residents' educational outcomes and support them to improve personal well-being and plan their future career. A specific faculty development program for mentors was designed and implemented.

Methods: Medical professors of 6 residency programs (internal medicine, obstetrics and gynecology, radiology, neonatology, geriatrics, and quality of clinical care) were invited to become mentors and required to accomplish a training of 3 modules: (1) mentoring in a wellness program; (2) strategies and tools for mental health and suicide prevention; and (3) mentoring and support services for case reference. The first module was an introduction to the program, objectives, role, and interviewing techniques. The second module was the suicide prevention QPR (question, persuade, refer) gatekeeper training. The third module was a case simulation training, focusing on mentoring interviewing techniques and identification of cases needed to be referred for support.

Results: From August 2018 to February 2019, 44 professors of 6 residency programs (internal medicine, obstetrics and gynecology, radiology, neonatology, geriatrics, and quality of clinical care) accredited the training.

Conclusions: After completing their training, the mentors have one-on-one meetings with residents in which they talk about concerns. After identifying any problems in each of the mentoring categories (academic, personal, and future career), they would design a work plan and schedule a follow-up meeting within 3 months. If the situation warrants it, the mentor will be able to refer the resident to the corresponding support department.

Mentoring program for medical residents: Design and implementation

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Introduction: In Tecnológico de Monterrey's Tec 21 Educational Model, mentoring has been declared as the main component. The National Science and Technology Council (CONACYT), through the National Postgraduate Programs of Quality (PNPC), has declared in its reference framework for the evaluation and monitoring of medical specialty programs that these must have academic tutoring. In the Multicenter Program of the Tecnológico de Monterrey, residents receive such accompaniment intermittently, irregularly, and informally, by professors who freely become mentors, without institution's intervention. Therefore, a solid program of mentoring is required to positively influence the academic, work, and personal satisfaction of the resident; therefore, is a formal system for evaluating the process and have accurate indicators.

Methods: The design began in April 2018 and ended in July 2018. The quality of clinical care, cardiology, geriatrics, neonatology, and radiology programs were selected first, because they were submitted in June 2019 to reaccreditation by CONACYT-PNPC. The mentoring program aims to enhance the academic performance, personal satisfaction, and work projection of the residents. The mentees will participate in the selection of their mentor (except the first-year residents who will be assigned one), indicating 3 options. Once the assignment is made, 2 documented interviews with their mentor will take place in the semester.

Conclusions: The program was implemented in 4 of the 5 medical specialties, after training of the mentors. An initial review of the progress began in January 2019. Subsequently, all 16 programs will be formally mentored.

Implementation and evaluation of a speed mentorship program for medical students: A quality improvement project

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Introduction: To implement and evaluate the impact of a speed mentorship event aimed at increasing long-term mentorship relationships among physicians in Ottawa and preclerkship medical students, as well as augmenting physician approachability.

Methods: With the goal of maximizing students' ability to interact with mentors, we invited 5 mentors from different leadership and specialty backgrounds and 23 students. The evening consisted of a "speed mentoring" component where students rotated between all mentors for 7 minutes each. Then, students were free to approach the mentors that they connected with and build on these relationships for a 1-hour "open networking" session.

Results: Twenty-one before and 16 after event surveys were completed. The pre-event survey revealed that 76.2% of students didn't have a mentor. Furthermore, 95.2% stated that a mentor could help them achieve their career goals and 57.1% of students had no or only one opportunity in the past year to gain a mentor in medicine. Comparing pre- and post-event data showed benefits of holding the event. For example, after the event there was a 35.7% increase in students who felt comfortable seeking career advice from physicians. By attending the event, 50.1% of students gained a mentor they could approach.

Conclusions: The event succeeded in its goal to help students connect with a mentor with a potential for long-term mentorship. Some students did not connect with a mentor, and future studies will use qualitative feedback to understand the differences in student experience.

Mapping the health advocate role across postgraduate medical education

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Introduction: Many programs struggle to demonstrate how they formally embed health advocacy (HA) into curricula, in part because educators remain uncertain about what advocacy means, and how it can be most effectively taught and assessed. By understanding how programs conceptualize and train the HA role, we may be able to develop more robust pedagogical strategies to meet learners' training needs.

Methods: We conducted a content analysis of curricular documents for 9 direct-entry specialties at each Ontario medical school. Objectives were thematically grouped based on key competencies for the HA role, then compared across schools. Objectives that did not seem to readily fit these competencies were analyzed separately.

Results: We identified inconsistencies across programs regarding the comprehensiveness and specificity of HA objectives. Some seemed either overly broad or misaligned with the CanMEDS definition, while others were clear, detailed, and linked to specific clinical activities. Additionally, assessment criteria varied, with most programs requiring learners to demonstrate competence by explaining the meaning of HA and identifying instances where it was needed; few required explicit engagement in HA-related activities. We could not identify a clear link between these criteria and stage of training.

Conclusions: The unclear relationship of some objectives to the HA role, coupled with variable assessment criteria, left the medical students on our team wondering what will be expected of them once they reach residency. To make training more transparent, we will interview educators to both clarify expectations and to identify opportunities to better prepare learners for the HA role.

Optimizing cognitive load in the workplace-based learning environment: Managing the tasks and minimizing the time pressures to support teaching

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Introduction: Although workplace-based learning predominates postgraduate medical education, aspects could be suboptimal for learning. Applying principles of cognitive load theory to manage intrinsic load (complexity of the task), minimize extraneous load (any aspect that is not part of task completion), and promote germane load (processing for storage in long-term memory) is challenging because sources of cognitive load in the workplace are not well understood. Our study explored the sources of cognitive load in a workplace-based learning environment using echocardiography interpretation as a model.

Methods: Using a constructivist thematic analysis approach, semistructured interviews were purposively conducted with 9 cardiology trainees (postgraduate year 4 [PGY-4] = 2, PGY-5 = 2, PGY-6 = 4) at the University of California San Francisco until data were saturated. Two independent coders analyzed transcripts. The team reconciled codes through consensus discussions.

Results: The task, insufficient supportive curriculum, and inconsistencies in matching tasks to learner level were sources of intrinsic load. Although trainees described self-directed strategies for germane processing, germane load was predominately promoted through task-driven interactions with teachers. Time pressures, interruptions, and technology were sources of extraneous load, which impacted intrinsic and germane loads. Using technology to complete the report added to the intrinsic load of the task. Time pressures and interruptions limited task-driven interactions with teachers, which had consequences on learning given the insufficient supportive curriculum.

Conclusions: Focusing on the identified sources of cognitive loads should optimize workplace-based learning. Specifically, the reliance on teachers for germane processing emphasizes the need for adequate time for teaching and learner-directed strategies to promote germane load.

Residents' perceptions on the impact of order sets on their learning: A grounded theory study

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Introduction: Order sets are used in the emergency department to ensure provision of evidence-based standardized management for a given condition. Order sets improve patient care but the impact on the resident learning experience has not been well explored. Our objectives were to explore residents' attitudes and experiences toward order sets, as well as the perceived influence on their learning.

Methods: We interviewed 16 pediatric and emergency medicine residents who had completed rotations in the pediatric emergency department. A grounded theory approach was used to analyze the data for major categories of information. Relationships between these categories were identified and a concept map was created to further explore our generated theory.

Results: The impact of order sets on residents' learning is influenced by their attitudes and experiences using them in the clinical environment. Residents perceive both positive and negative influences from the use of order sets on their learning. Regarding positive influences, residents perceive that order sets reduce cognitive burden and provide a framework for teaching. Negative influences include a decrease in critical thinking and knowledge acquisition, in addition to a lack of feedback on clinical cases managed using order sets.

Conclusions: Medical educators should consider adapting their educational approach to encourage the positive influences of order sets on learning, while developing strategies to minimize the negative influences on the resident learning experience.

How the CanMEDS professional role can save idealism in residency education: Insights from senior internal medicine residents

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Introduction: Idealism, or “the pursuit of noble principles, purposes, or goals,” includes the qualities that traditionally inspire physicians in training. Idealism is usually present early in medical training, but has been shown to decrease over time due to pragmatism and cynicism. Fatigue and increasing clinical volumes in a resource-limited health care system have been implicated in the decline of trainee idealism. Preserving resident idealism is necessary to maintain the delivery of high-quality, compassionate care to patients. The purpose of this research is to explore the perceptions of idealism in internal medicine residents, and how it can be preserved.

Methods: Using the CanMEDS professional role as a framework, residents were asked to answer 6 open-ended questions regarding their perceptions of idealism in residency education as part of an electronic learning module, and a thematic analysis of responses from 15 senior residents was conducted.

Results: Resident responses suggested that support for idealism in residency comes from role-modeling, education, patients, and their own personal values. The erosion of idealism is believed to be a result of witnessing unprofessional behavior, developing cynicism, and a lack of acknowledgement. Most residents feel that idealism cannot be taught, but can be maintained during residency through key elements of the CanMEDS professional role.

Conclusions: Maintaining idealism and preventing its erosion should be an essential goal of residency education. Educators are encouraged to continue to develop and examine the best methods for teaching the professional role in residency, as using it as framework can help maintain idealism.

Professional identity formation of surgical residents in their first year of postgraduate training

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Introduction: Professional identity is defined as “the internalized values of a profession as a representation of the self.” As medical students transition to residency, new social environments, clinical experiences, and curricular emphases can impact how they identify as professionals. The purpose of this study is to investigate how professional identity formation (PIF) occurs in surgical residents over their first year of postgraduate training.

Methods: Twenty-four surgical residents were interviewed at the start of their postgraduate training. Questions explored residents’ current understanding of what it means to be a medical professional. Six months later, residents completed a follow-up interview to investigate how their experiences in their training programs have influenced their professional identity. Thematic analysis was utilized to identify emergent themes in responses.

Results: After 6 months, the central focus of residents’ understanding of being a professional has shifted to patient care, and residents’ expectations are more aligned with that of their program. Residents acknowledge potential dissonance in their relationships with staff, and question the role of explicit teaching experiences in forming their professional identity.

Conclusions: Professional identity develops within training programs, with specific factors influencing the PIF process. Postgraduate surgical training programs are currently transitioning to a competency-based medical education (CBME) framework. This change may impact the social environment and formal curricula of these programs. CBME could create further dissonance between residents and staff through more frequent assessment, and redefine the perceived value of explicit learning outcomes. We must understand the implications of CBME toward the development of medical professionals.

What do residents learn from patients? Using narrative reflection to foster patient-physician partnership

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Introduction: Narrative medicine's ability to develop empathy and professionalism in small groups of medical students and residents has been documented. However, of yet, no study has examined the impact of a reflective narrative exercise for a large group of residents from a wide range of medical specialties. This study aims at documenting what residents learn from patients and how these experiences are reflected on through a narrative approach.

Methods: This qualitative study uses narrative texts written by medical residents. In the context of their mandatory ethics curriculum, residents are invited to write a story describing and reflecting on "something they learned from a patient." Participants were recruited from cohorts of residents in 2017 and 2018; informed consent was obtained. Qualitative data analysis led to the generation of nodes, codes, and themes.

Results: In total, 70 texts were collected from residents enrolled in 18 different specialties. Learning episodes occurred most frequently in stressful or pressured environments, often oncology or end-of-life settings. Main themes identified in analysis include: patient-centered care as an opportunity for personal growth and for provision of quality medical care, humility, communication as a therapeutic intervention and a source of suffering, and the importance of active listening. Learners articulated their experience using typical literary devices: the "narrative arc," figures of speech, and labeling of unspoken emotions.

Conclusions: This qualitative study suggests narrative medicine is an interesting pedagogical tool to promote self-reflection in medical residents across a variety of specialties, around the themes of communication and patient-centered care.

Behavior remediation in postgraduate medical trainees—A scoping review

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Introduction: In the era of competency-based medical education (CBME), behavior remediation in postgraduate medical education (PGME) trainees is an important topic. Behavior falls under “professionalism,” an essential component of any medical professional’s commitment to patient care. Despite its importance, however, PGME programs are unsure how to appropriately remediate trainees with deficiencies in this domain. Traditionally, trainees have been promoted within their training programs under the proficiency of medical expert with inadequacies in behavior/professionalism. With a renewed emphasis on CBME, and on patient safety and quality, there is a unique role for determining a method of remediation in PGME trainees who have behavioral deficiencies.

Methods: A scoping review of behavior remediation in PGME trainees was conducted to determine strategies and interventions that have been utilized by PGME training programs. PubMed and Embase electronic databases were searched.

Results: Out of the 162 articles found, 22 articles were included in this scoping review. Various strategies are implemented by PGME programs to remediate PGME trainees with behavioral/professionalism deficiencies. These strategies are listed in this review.

Conclusions: Remediation of PGME trainees with behavioral/professionalism deficiencies has been a challenge for PGME training programs. Our search has revealed that PGME programs use a variety of remediation strategies. The efficacy of these interventions, however, was not always discussed or assessed.

Exploring implicit theories of intelligence through recommendations for resident remediation

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Introduction: A growth mindset (ie, the belief that ability can improve) is associated with improved learning outcomes, compared to a fixed mindset (ie, the belief that ability is fixed). However, recent research has shown that mindsets can differ according to the dimension of competency, yet this dimensionality phenomenon has not been explored in medical education. The objective of this study was to explore how implicit theories of intelligence (ITI), a measure of mindset, differed between CanMEDS roles and whether they correlated with recommendations for remediation planning.

Methods: This cross-sectional study of obstetrics and gynecology residents and faculty measured differences in ITI regarding the professional and medical expert roles directly, using a modified scale, and indirectly, using case vignettes of residents requiring remediation. We asked respondents to provide a remediation plan for 6 fictitious cases describing a resident with significant deficits in either the professional or medical expert role. We used statistical analyses to explore (1) differences in ITI between roles; (2) differences in recommendations for remediation according to role; and (3) correlation between ITI and recommendations for remediation.

Results: Preliminary data revealed differences between ITI related to the professional and medical expert role. Respondents' ITI correlate partially with recommendations for remediation, according to role.

Conclusions: Our findings indicate that domain-specific mindsets exist and differences in recommendations for remediation correlate with ITI. Therefore, mindset is domain-specific and can guide our management of the struggling learner. Future research may focus on how to shift from a fixed to a growth mindset in this context.

Exploring the development of adaptive expertise in navigating difficult conversations

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Introduction: Navigating difficult conversations is an advanced communication competency that residents need to develop as they transition into independent practice. Our limited understanding of how residents learn to navigate difficult conversations restricts our ability to teach this skill. We explored how residents and newly graduated physicians moved from routinized, scripted approaches to using flexible, adaptive strategies when navigating difficult conversations and how learning experiences facilitated this change.

Methods: A constructivist grounded theory study was conducted using semistructured interviews of 13 physicians (4 residents, 8 physicians in practice 5 years or less, 1 experienced physician) from a division of developmental pediatrics in 2017. Interviews explored how participants engaged in and learned from difficult conversations. Constant comparative analysis was used to identify themes iteratively. Themes were identified both inductively and deductively using the conceptual framework of adaptive expertise.

Results: Three main themes were identified. Two themes described a developmental trajectory that occurs as trainees move into independent practice. There is an emerging understanding of flexibility and recognition that difficult conversations cannot be standardized. An openness develops that allows physicians to adapt in the moment based on the patient's and family's cues. Development of this skill requires active experimentation and practice to develop confidence and comfort with flexibility.

Conclusions: There is a developmental trajectory that occurs during transition to independent practice, and this study provides important information on how physicians develop a deeper conceptual understanding of difficult conversations and the openness required to employ adaptive strategies to meet families' individual needs.

Attitudes toward research during radiation oncology residency training: A survey of Canadian radiation oncology residents and program directors

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Introduction: A deeper understanding of the barriers to performing research during residency, what factors promote resident interest in research, and what factors are supportive to residents completing high-quality projects will be helpful to programs as they restructure research participation with Competence By Design (CBD) implementation.

Methods: Following local ethics approval, anonymous, voluntary, online surveys were circulated to all Canadian radiation oncology program directors and residents. Information collected included unidentifiable demographics, prior research experience, and description of current research environment and barriers to engaging in research and scholarly activities.

Results: The response rate was 32% (34 of 105) for residents and 71% (10 of 14) for program directors. Ninety-seven percent of residents and 90% of program directors felt research/scholarly activity was an important part of residency training, but 47% did not think that it was adequately protected from other activities. Sixty percent of programs allowed 1 month or less of protected research/scholarly activity time. The highest barriers to completing research/scholarly activity projects were lack of protected time (for both residents and faculty), high resident clinical workload, and lack of experience in developing a proposal or manuscript writing. With CBD implementation, 50% of programs intend to integrate research longitudinally at various phases of training.

Conclusions: Residents expressed strong enthusiasm to participate in research/scholarly activity, yet lack of protected time and competing demands are identified as major barriers. Restructuring of research/scholarly activity with the transition to CBD as well as provision of more formal training in research methodology may be worthwhile to improve the resident research/scholarly activity experience.

Observational learning: Strategies to enhance resident skill acquisition

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Introduction: Several fields, including psychology, sports science, and medical education, have investigated how observation enhances skill acquisition. We conducted a scoping review to synthesize the literature across these domains, with the aim of identifying best practices that may be applied to skill acquisition in residency.

Methods: We conducted a systematic search using the following databases: Embase, Ovid MEDLINE(R), PsycINFO, and SPORTDiscus. Experimental studies and reviews that investigated and/or discussed observational learning (OL) through video were included. Two independent reviewers completed a title/abstract review, full-text review, and data extraction of the selected articles.

Results: Of the 1258 articles identified, 158 articles were included in the final review. The selected articles investigated OL versus physical practice, learning from models with different levels of experience, and types and timing of feedback. While observation enhances motor skill learning beyond physical practice alone, discernable improvements in skill depend on the model's experience and the level of the learner. Further, feedback (either visual or verbal) enhances skill acquisition, especially when requested by the learner.

Conclusions: Observation enhances motor skill learning, but specific aspects (ie, the level of expertise of the model, the nature of feedback provided) influence the effectiveness of OL. However, the complexity of the clinical learning environment makes it challenging to identify the most important variables for making tangible improvements in resident performance. We will present the evidence gleaned from our review using examples from the residency context, to help medical educators and residents make use of the evidence for OL in skill acquisition.

Grounding pediatrician-scientist development in professional identity formation: Early outcomes of the Pediatrician-Scientist Training and Development Program

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Introduction: The training pipeline for physician-scientists begins in medical school, transitions to residency and fellowship training, and finally to junior faculty. The pipeline for the physician-scientist workforce is endangered by inadequate recruitment, limited funding, and attrition. In an effort to strengthen the physician-scientist career, Baylor College of Medicine (BCM) and Texas Children's Hospital (TCH) implemented the Pediatrician-Scientist Training & Development Program (PSTDP). The PSTDP strives to cultivate the development of pediatrician-scientists through grounding immersion in both clinical and scientific practice environments through a unique parallel curriculum. We report early outcomes since implementation in 2014.

Methods: To carry forth the mission, a conceptual framework of Pediatrician-Scientist Professional Identity Formation and a novel curriculum were implemented. Upon matriculating into the BCM PSTDP, residents begin transforming from a novice medical student to an expert pediatrician-scientist. Such transformation entails continuously creating and refining "provisional selves" through interdisciplinary programmatic experiences. The PSTDP offers a year-specific curriculum that includes clinical case report writing (year 1), a pilot grants program (year 2), and pediatrician-scientist identity formation reflection (year 3) through narrative writing.

Results: As the program is now midway through the third year, short-term goals have been achieved of increasing matriculation of MD/PhD residents that apply and matriculate into the BCM residency by 4-fold along with 75% of the first PSTDP class matching into TCH for subspecialty training.

Conclusions: The BCM PSTDP has successfully matriculated 6 MD/PhD residents who have generated 20 publications during residency and have significantly increased recruitment of residents committed to a career of physician-scientists. The program serves as an early training model for cultivating pediatrician-scientist development in the framework of professional identity formation.

Scoping review of ambulatory care education in internal medicine

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Introduction: Ambulatory clinics offer a potential solution to recent challenges faced by hospital health care systems, such as increasing patient volumes and complexity amid funding constraints. Despite increased emphasis on the provision of ambulatory care, there has been a relative paucity of ambulatory care training curricula within Canadian internal medicine residency programs. We conducted a scoping review to understand the current state of knowledge on ambulatory internal medicine care and postgraduate training in ambulatory care education (ACE), in order to frame a research agenda for ACE for internal medicine in Canada.

Methods: We searched Ovid MEDLINE, Embase, and PsycINFO for articles that included the concepts of ambulatory care and medical education or health professions education from 2005–2015. After sorting for inclusion/exclusion, 38 articles were included for analysis and synthesis through open coding to look for dominant or prevalent claims and assumptions about ACE.

Results: We found 3 overarching assumptions and claims among these articles, which were mostly authored from American perspectives. First, ACE is considered to be a necessary component of medical training because of its unique nature. Second, current models of ambulatory care clinics do not meet residency education needs. Third, ACE presents opportunities to develop non-medical expert or “intrinsic” roles of care.

Conclusions: The findings of our scoping review point to a need for alignment between health professions education and societal needs, more Canadian research into ACE, studies of how to structure internal medicine residency training for ACE, and how ACE facilitates the development of intrinsic roles of care.

Availability of musculoskeletal ultrasound training in Canadian physical medicine and rehabilitation residency programs

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Introduction: Physiatrists deal regularly with musculoskeletal disorders. Musculoskeletal ultrasound (MSUS) improves accuracy and efficacy of therapeutic procedures targeting these structures. Although there has been rapid advancement of MSUS use clinically, the Canadian physiatry residency curriculum has not formally included these skills. This study assessed the availability of MSUS training relative to the educational demands of residents and expectations of program directors.

Methods: All Canadian physiatry residents and program directors were invited to complete an anonymous online survey. Survey questions were created de novo, targeting current demands for MSUS training, available experiences, and perceived ability to meet demands, using 5-point Likert scale ratings. Survey responses were collected between March and November 2018. Quantitative data were compared using descriptive statistics. This project had ethics approval.

Results: Response rate was 55% for residents and 69% for program directors. Eighty-nine percent of residents reported moderately high to high interest in pursuing interventional MSUS in the future. However, 53% reported MSUS training opportunities as “unavailable” to “somewhat difficult to access,” and 73% reported minimal to no clinical exposure thus far. Conversely, 33% of program directors felt MSUS training is difficult to access. While 73% of residents felt MSUS training should be a national training objective, 100% of program directors felt it should not.

Conclusions: This study demonstrates that physiatry residents have strong interest in interventional MSUS, but perceive a lack of access to training for this skill. As clinical physiatry practices evolve, residency training objectives may need to adapt to best prepare trainees for their future careers.

Informing a medical assistance in dying curriculum in specialty residency training programs

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Introduction: Medical assistance in dying (MAID) became legal across Canada when Bill C-14 was passed in 2016. Currently, little is known about practitioner interest in MAID education, the most effective strategies for providing MAID education, and the importance of integrating MAID into existing curricula. This study examined and compared residents' and faculty preceptors' perspectives about MAID.

Methods: Two anonymous surveys were distributed to residents ($n = 549$) and preceptors ($n = 797$) in 29 specialty programs. Survey data were analyzed using descriptive and inferential statistics.

Results: Response rates were 23.1% for residents and 13.0% for preceptors. Preceptors were more comfortable and competent discussing MAID with a patient compared to residents ($P < .001$ and $P = .007$, $\alpha = .05$), though residents were more likely to want to participate in a MAID assessment ($P < .0001$). The majority of both residents ($73.5\% \pm 8.0\%$) and preceptors ($79.0\% \pm 8.0\%$) believe it's important to include MAID education in their specialty's curriculum. The most important topics were the discussion of MAID with patients ($90.4\% [\pm 5.4\%]$ and $79.6\% [\pm 8.0\%]$ of residents and preceptors, respectively) and regulations and legal aspects ($87.0\% [\pm 6.2\%]$ and $84.7\% [\pm 7.0\%]$ of residents and preceptors, respectively).

Conclusions: Significantly more residents want to be part of the assessment and clinical teams providing MAID compared to preceptors; however, both groups agree that it is important to include MAID education in the curriculum of their specialty program. Next steps will focus on the creation of MAID learning outcomes and development of MAID curriculum appropriate to the educational needs of each specialty residency program.

Assessing impact of research training on performance in general surgery residency

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Introduction: It is commonplace for North American trainees to interrupt their surgical residency programs to complete 2 or more years of research training. The impact of this practice on surgical education is unknown. As the University of Toronto has both the largest general surgery and surgeon scientist training programs, we have the opportunity to evaluate performance of residents in both clinical and research streams serially on annual in-training clinical aptitude examinations.

Methods: We collected anonymized scores obtained at both written and oral annual in-training aptitude examinations by all general surgery residents at the University of Toronto from 2011 to 2016, inclusively. We compared performance of residents prior to, during, and following their research training both to themselves and to their peers in clinical training.

Results: At the junior resident level, future enrollment in research training was associated with higher examination performance ($P = .003$). Annual scores plateaued during research training ($P = .50$), while scores of residents who continued in clinical training improved year over year ($P = .009$). Research stream resident examination scores remain stagnant after 1 year then improve in the second year back in clinical training ($P = .90$ and $P = .00007$, respectively). Scores obtained in the final year of residency training do not significantly differ between the 2 groups of residents.

Conclusions: We demonstrate that interruption of clinical activities for research training results in “hibernation” of aptitudes on annual in-training examinations, with an eventual catching up after at least 2 years of resumed clinical training. This may inform residency program designs.

Basic science of chemotherapy e-modules—Does spaced access improve outcomes?

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Introduction: Retention of basic science knowledge can be challenging for trainees in medicine. Education literature has previously shown that knowledge retention improves when information is delivered gradually over a period of time as opposed to all at once. However, studies of how to effectively deliver online education so that this spacing effect is maximized are lacking. We developed an online course consisting of 8 e-modules for medical oncology trainees and studied whether spaced versus simultaneous access would improve knowledge retention.

Methods: A randomized trial included postgraduate year 4 (PGY-4) and PGY-5 medical oncology residents across Canada over 2 years. Trainees were randomized 1:1 at enrollment to simultaneous or spaced access (2-week intervals) to the e-modules. Outcomes included baseline knowledge (T0), post-course knowledge (T1), and delayed knowledge (T2). The differences in knowledge retention were analyzed using analysis of covariance and adjusted for T0.

Results: Eighty-six trainees enrolled and 42 completed the course. There was no significant difference in T0 (0.3 [-0.1–0.7], $P = .20$) or T1 scores (1.9 [-0.6–4.4], $P = .13$) between the simultaneous and spaced groups. Eleven participants completed the T2 test at 3 months with a trend toward higher scores in the spaced group. Course evaluation showed students were satisfied, felt it had clinical relevance, and preferred the online format over traditional lecture.

Conclusions: Spacing e-modules does not impact short-term knowledge retention. Although there was a trend toward improved long-term knowledge scores in the spaced group, due to the small number of participants included this finding is exploratory and warrants further study.

Can an online educational module improve medical trainee confidence and knowledge of coagulation?

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Introduction: Coagulation has notoriously been a topic that trainees find challenging to learn. A lack of understanding around coagulation has led to widespread inappropriate ordering and misinterpretation of coagulation tests. Trainees have attributed their suboptimal knowledge to the manner in which coagulation is taught in medical schools and residency programs.

Methods: We created an online educational module on coagulation targeting internal medicine trainees (www.coagtesting.com). Our educational module was evaluated with 30 participating trainees. Participants completed a validated knowledge pre-quiz on coagulation, the e-module, and the post-quiz following the module. To assess longer-term knowledge retention, participants are asked to repeat the knowledge quiz 3 months following their initial participation.

Results: The median pre-module knowledge quiz score was 67% (range 24%–81%) with an increase of 24% to a median post-module quiz score of 91% (range 64%–100%). Eighty percent of trainees endorsed increased confidence regarding their knowledge of coagulation following completion of the module. Furthermore, the module was completed by over 550 unique visitors worldwide in the first 2 months following its launch.

Conclusions: We have demonstrated a significant increase in trainee knowledge and confidence regarding coagulation with our educational intervention. Using the expertise of medical educators and incorporating feedback from trainees, we have employed a novel approach to the teaching of coagulation to maximize its approachability and clinical relevance. The degree to which trainees have been utilizing our educational module worldwide emphasizes the need for this resource and its importance in bridging a large gap in medical training.

Online interactive video-based modules for residency orientation in pediatrics

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Introduction: Physicians commencing pediatric residency describe high levels of job anxiety, from managing newborn resuscitations to unstable children. Lengthy text-based orientation guides currently provided may be unread or poorly understood and onsite orientation can be time constrained and cognitively overloaded. We hypothesized that residents prefer learning from short instructional videos, allowing self-pacing of instructions received and learner reflection. Senior staff time could then be redeployed for ongoing education and support.

Methods: We developed e-learning modules, accommodating video instruction, interrupted by situational judgement questions to stimulate learner interaction, after which feedback is provided. These are completed incrementally, covering clinical competencies to be achieved across the 24-hour work schedule, including the areas across which clinical activity is located (emergency room, pediatrics, neonates). Learners targeted are hospital physicians and nurses. The modules are coupled to a learning management system, where individual progress is tracked, pre- and post-completion knowledge compared, with utility and information applicability surveyed.

Results: We called the pilot implementation of e-learning modules SQiF CLIPS (Situation Question Interaction Feedback for Clinical Learning in Pediatric Skills). Each of 8 modules comprised 5 parts, with a total of $8 \times 5 = 40$ videos, 40 corresponding questions (to address 40 clinical learning competencies to be achieved). Once begun, learners took 60 to 90 minutes to complete these.

Conclusions: The SQiF CLIPS system presents pediatric residency orientation as video-based clinical vignettes with interactive learning. It's an innovative way of teaching job competencies to junior physicians, compared to previous methods using manuals and/or lectures.

Online photo challenge via Google Form: An educational innovation to stimulate effective learning in ophthalmology

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Introduction: The learning process in ophthalmology emphasizes visual disease manifestations, which can be traced to aspects such as epidemiology, clinical manifestations, and management. However, contemporary teaching methods of lecturing are often insufficient for facilitating learning and difficult to evaluate the knowledge and understanding of students. To stimulate effective learning, an online photo challenge was developed to evaluate the residents.

Methods: Five residents from the third year of training were asked to do the photo challenge by typing all they know about the disease depicted in the photo within 5 minutes. After the challenge is over, qualified ophthalmologist instructors will then go through all the answers, discuss with the team, and score the team's performance on quality and completion of discussion and provide feedback.

Results: Participating ophthalmology residents favored the activity as they are able to summarize and self-evaluate themselves at the time and benefited from engaging in the learning experiences as well as being given opportunities to practice clinical thinking processes by attempting to summarize the clinical diagnosis from important findings and management of the disease. Instructors are able to assess their students' degree of success in learning outcomes and provide instant feedback.

Conclusions: The online photo challenge activities are engaging for learners and enable them to summarize their knowledge, applicable to everyday practice and, in addition, evaluate themselves after the quiz. Instructors are able to emphasize knowledge and guide clinical thinking relevant to the learning outcomes after each session.

Beyond just coffee talk: Well-structured online journal clubs are engaging both during and after the active discussions

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Introduction: Online journal clubs may offer greater flexibility that addresses participant constraints and better accommodates participant utilization preferences. NEJM Resident 360 is a medical educational website with over 100,000 members and facilitates an online journal club hosted by a residency program. We describe the NEJM Resident 360 online journal club experience, including participant characteristics, participation, and interest during and after online journal club discussion.

Methods: From May 2017 through January 2019, NEJM Resident 360 hosted 12 online journal clubs moderated by residents and faculty, each lasting 10 days. Data were analyzed for number of views during and following active discussion. Numbers of questions and responses posted by moderators, study authors, and members of the NEJM Resident 360 community were collected.

Results: There were a total of 101 medical trainees, 61 faculty, and 40 study author participants. Each journal club discussion had an average of $16,114 \pm 11,490$ views (range 1644–43,327) while active and an average of 4115 ± 2438 views afterward (range 715–9409). The most active discussion was on partial oral versus intravenous antibiotic treatment for endocarditis with 180 questions and responses during active discussion. The most viewed topic was on adjunctive glucocorticoid therapy in septic shock with 52,736 views from discussion initiation in February 2018 through January 2019.

Conclusions: NEJM Resident 360 online journal clubs results in learner engagement both during and after the discussion. More research is required to determine the most engaging parts of an online journal club and which formats result in higher overall learning retention.

“There’s an app for that”: Use of a smartphone app for ICU rotation orientation

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Introduction: The department of critical care at Dalhousie University has developed a smartphone application (“app”) to address concerns regarding the adequacy of the intensive care unit (ICU) rotation orientation. The aim of this study was to identify learner perceptions of ICU orientation prior to release of the app and to compare them to perceptions after the app’s launch.

Methods: Surveys were issued to learners (rotating residents and medical students) in the ICUs at the QEII Health Sciences Centre approximately 1 week after the start of their rotation. The sample of convenience included 66 learners before the launch of the app and 77 afterward. Satisfaction with orientation materials and what resources were used to learn essential ICU tasks were investigated.

Results: One hundred percent of all participants asked to participate in the study completed a survey. A total of 75.3% of survey respondents reported trying the app, and the app was perceived as useful. There was a statistically significant improvement in satisfaction with orientation materials following the app’s launch ($P = .001$), with more participants ranking their satisfaction as 4/5 and 5/5. The app was the second most frequently cited “most helpful resource” after “other residents in the ICU.”

Conclusions: An ICU orientation app resulted in increased satisfaction with ICU orientation materials. There is potential to improve the experience of medical learners with this popular technology.

@InternAtWork: Learner-generated podcasts with worldwide reach

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Introduction: “The Intern at Work” is a learner-generated, faculty-reviewed podcast. Learner-generated podcasts can substitute or complement scholarly projects, which are mandatory during residency programs. Using multiplatform analytics, we analyzed our podcast for writer participation, listener reach, and consistency across episodes.

Methods: Residents across Canada are invited to write a podcast for “The Intern at Work.” Podcasts follow a standardized script, and are reviewed by 2 faculty physicians who provide direct feedback to the resident writer. Episodes are uploaded to the podcast platform Buzzsprout for worldwide distribution on iTunes, Spotify, and Google Play. We assessed writer participation by totaling the number of past (already written) and active (in the process of writing) resident writers and previously involved faculty members. Inherent analytics built into Buzzsprout, iTunes, and Twitter are used to assess podcast reach and consistency among episodes.

Results: Since the release of the first podcast last year, 52 residents and 35 faculty physicians from 5 Canadian medical schools have voluntarily contributed to the project. The 25 released episodes have reached over 37,000 individual listens across 7 continents. Within the first 90 days of release, each episode is expected to generate approximately 1300 individual downloads. Fifty-eight percent of podcasts are accessed in the United States, 28% in Canada, and 14% in other countries. On Twitter, our recent podcast release on Sepsis has generated global conversation with 1859 impressions and 387 engagements.

Conclusions: Resident-led technology-based scholarly activities can have a global reach while encouraging ongoing knowledge consolidation and dissemination among learners.

Evaluation of the effect of a smartphone-based feedback app on trainees' and trainers' perceptions in orthopaedic surgery

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Introduction: Surgical education continues to strive for more effective feedback for learners. There is often a mismatch between learners' and trainers' perceptions of the topics and outcomes of feedback conversations. Utilizing mobile-enabled learning, the Australian Orthopaedic Association (AOA) developed a smartphone-based feedback app, intended to facilitate real-time feedback conversations and to promote a shared understanding of these discussions.

Methods: Feedback perceptions were sought before and after introduction of this feedback app from Australian orthopaedic trainers and trainees. Their agreement with statements concerning aspects of feedback behaviors, as well as their comments regarding the topics covered in feedback and its effect, were sought in the 2 surveys.

Results: Prior to introduction of the feedback app, a feedback perception mismatch existed between orthopaedic trainers and trainees, involving their perceptions of feedback: expectations, frequency, recognition, immediacy, content, and reciprocity. After introduction of the feedback app, there was a significant reduction in the trainers' perception of: the trainees' ability to act on feedback and the trainees' ability to request help with their learning. Feedback topics covered more "non-technical" skills after introduction of the feedback app.

Conclusions: The differences demonstrated between orthopaedic trainers' and trainees' perceptions of feedback before introduction of the feedback app are similar to those already described. The feedback app may interfere with the trust and reciprocal communication essential in an effective feedback conversation.

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