

**P030****Multisource feedback for emergency medicine residents: different, relevant and useful information**

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**Introduction/Innovation Concept:** Feedback provided to residents by physicians emphasize the medical expertise competency and may limit the attention paid to other CanMEDS competencies. Recent years have seen the emergence of the concept of multisource feedback, a process through which different members of the care team assess and provide feedback to residents. This approach is considered one of the best for providing relevant feedback on competencies that are less often addressed by physicians. To date, very few studies have explored emergency residents' perceptions following feedback from their physicians, nurses with whom they have worked, and patients they have treated. **Methods:** In the emergency department of a tertiary-care university hospital, 10 emergency medicine residents participated, on a voluntary basis, in individual and semi-structured group interviews, three months after having received multisource feedback. Two researchers then qualitatively analyzed the data collected in those interviews. Thematic content analysis using QDA Miner identified dominant themes in the residents' perceptions. **Curriculum, Tool, or Material:** Multisource feedback tool: Three questionnaires were designed to gather assessment from different sources: physicians, nurses, and patients. The questionnaires were adapted from those created by Joshi and colleagues for use in a study of residents' competency in interpersonal and communication skills. During a nine months period, the residents distributed questionnaires to physicians, nurses, and patients with whom they felt they had enough interactions during their clinical shifts. Data from the questionnaires were compiled by two educators that prepared individual feedback reports for each resident. An educator was asked to conduct individual meetings with each resident to present the feedback report and discuss its content. **Conclusion:** Each source provided relevant comments that differed significantly in their content. Physicians focused primarily on medical expertise, whereas nurses addressed competencies related to management, collaboration, and communication, and patients commented on the competencies of professionalism and communication. Residents concluded that obtaining feedback from nurses and patients was not only acceptable but useful in their training. Several reported modifying certain behaviours after receiving the multisource feedback. Multisource feedback appears to have obvious teaching potential to provide feedback on competencies other than medical expertise in emergency residents.

**Keywords:** Multisource feedback

**P031****Using machine learning algorithms for predicting future performance of emergency medicine residents**

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**Introduction: Background:** Medical education is transitioning from a time-based system to a competency-based framework. In the age of Competency-Based Medical Education, however, there is a drastically increased amount of data that needs to be interpreted. With this data, however, comes an opportunity to develop predictive analytics. Machine learning is a method of data analysis that automates analytical model building. Using algorithms that iteratively learn from data, machine learning allows computers to find hidden insights without being explicitly programmed where to look. Machine learning has been

successfully used in other fields to create predictive models. **Objective:** This study evaluates the application of neural network as a machine learning algorithm in learning from historical data in emergency residency program and predicting future resident performance. **Methods:** We analyzed performance data for 16 residents (PGY1-5) who were assessed at end of each shift. Performance was graded in each of the CanMEDS Roles with scores from 1 to 7 by different attending physicians who observed residents during the shift. We transformed sequences of scores for each resident to a fixed set of features and combined all of them in one dataset. We considered scores under 6 as "At Risk Resident" and scores 6 or more as "Competent Resident", and then we separated the dataset into training and testing sets using K-Fold cross validation and trained an artificial Neural Network in order to make decision about the future situation of residents in a specific CanMEDS Role and general performance. **Results:** We used 5-fold cross validation to evaluate the model, one round of cross-validation involves partitioning the whole data into complementary subsets, performing the training phase on the training set, and validating the analysis on the testing set. To reduce variability, multiple rounds of cross-validation are performed using different partitions, and the validation results are averaged over the rounds. Results of cross validation show that accuracy of model was 72%, sensitivity was 81% and specificity was 43%. **Conclusion:** Machine learning algorithms such (as Neural Network) have the ability to predict future resident performance on a global level and within specific domains (i.e. CanMEDS roles). Used appropriately, such information may be a valuable for monitoring resident progress.

**Keywords:** prediction, neural network, machine learning

**P032****Identifying the bleeding and thrombosis learning needs of the Free Open Access Medical education (FOAM) community**

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**Introduction:** Developing structured online educational curricula that meet learner needs is challenging. Thrombosis and bleeding are areas of innovation and change in emergency medicine. We aimed to determine the learning needs of the Free Open Access Medical education (FOAM) community with the subsequent goal of developing structured curricula to meet them. **Methods:** A Massive Online Needs Assessment (MONA) was conducted to determine the perceived and unperceived educational needs in thrombosis and bleeding. The survey was designed by a multidisciplinary team of experts and was open from September 20 to December 10, 2016. The survey requested limited demographic information and contained questions to identify topics of interest. Respondents' baseline knowledge and unperceived needs were assessed using 5 case scenarios containing 3 questions each. Knowledge gaps were defined *a priori* as topics where <50% of participants answered correctly. **Results:** We received 198 complete responses by staff physicians (n = 109), residents (n = 46), medical students (n = 29) and allied health professionals (n = 14) from 20 countries. 116/198 responses were from people working in emergency medicine. Topics of interest to participants included choice of anticoagulants, interruption of anticoagulation, management of bleeding and monitoring anticoagulation. Knowledge gaps were identified in 4 main areas including interruption of anticoagulation, management of bleeding (including reversal of anticoagulation and massive transfusion), inherited thrombophilia, and screening for malignancy in acute thrombosis.

**Conclusion:** We have identified six priority topics to cover in our future online Thrombosis and Bleeding curriculum by surveying the online medical community. Although perceived and unperceived needs showed high congruence, two priority topics were only identified by assessing unperceived needs.

**Keywords:** free open access medical education, needs assessment, curriculum planning

### P033

#### To choose or not to choose: evaluating the impact of a Choosing Wisely knowledge translation initiative on urban and rural emergency physician guideline awareness

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**Introduction:** Choosing Wisely is an innovative approach to address physician and patient attitudes towards low value medical tests; however, a knowledge translation (KT) gap exists. We aimed to quantify the baseline familiarity of emergency medicine (EM) physicians with the Choosing Wisely Canada (CWC) EM recommendations. We then assessed whether a structured KT initiative affected knowledge and awareness. **Methods:** Physicians working in urban (tertiary teaching hospital, Saint John, NB) and rural (community teaching hospital, Waterville, NB) emergency departments were asked to participate in a survey assessing awareness and knowledge of the first five CWC EM recommendations before an educational intervention. The intervention consisted of a 1-hour seminar reviewing the recommendations, access to a video cast and departmental posters. Knowledge was assessed by asking respondents to identify 80% or more of the recommendations correctly. Physicians were surveyed again at a 6-month follow up period. The Fisher exact test was used for statistical analyses. A sample size of 36 was required to detect a 30% change with an alpha of 0.05 and a power of 80%. **Results:** At the urban site, 16 of 25 (64%) physicians responded to the pre- and 14 of 26 (53.8%) responded to the post-intervention survey. Awareness of the EM recommendations did not increase significantly (81.3% pre; 95% CI 56.2-94.2 vs. 92.9% post; 66.4-99.9;  $p = 0.60$ ). There was a weak trend towards improved knowledge with 62.5% (38.5-81.6) of physicians responding correctly initially, and 85.7% (58.8-97.2;  $p = 0.23$ ) after the intervention. At the rural site, 8 of 11 (72.7%) physicians responded to the pre- and post-intervention survey. There was a trend towards improved awareness, (25% pre; 6.3-59.9 vs. 75% post; 40.1-93.7;  $p = 0.13$ ), with 50% (21.5-78.5) responding correctly pre, and 87.5% (50.8-99.9;  $p = 0.28$ ) after the intervention. **Conclusion:** We have described the current awareness and knowledge of the CWC EM recommendations. Limited by our small sample size, we report a trend towards increased awareness and knowledge at 6 months following our KT initiative in a rural setting where there was a low baseline awareness. At the urban site where baseline knowledge was high, changes seen were less significant. Further work will look at the effectiveness of our initiative on physician practice.

**Keywords:** Choosing Wisely, physician awareness, knowledge translation

### P034

#### Pediatric emergency department return visits: a proactive approach to quality improvement

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**Introduction:** Emergency Department (ED) return visits leading to admission (RVs) are a well-recognized quality metric that can potentially signal gaps in patient care. Routine capture, investigation and monitoring of monthly ED RVs provides a better understanding of patient and visit-level factors associated with a return, which can then inform system-level quality improvement (QI) opportunities. The objective of this study is to develop a sustainable database that routinely tracks and analyzes pediatric ED RVs in a large Canadian children's hospital to understand recurring themes and inform QI initiatives.

**Methods:** Using a computerized record system, all 72-hour RVs are collected and reviewed for patient and visit-level variables. Clinicians receive monthly notification of their RVs and assist with completing root cause analyses. Ongoing cumulative analyses using descriptive statistics and t-test analysis are reviewed to identify trends and predictors of RVs. Targeted solutions are sought to address system-level themes through educational, quality, safety and administrative avenues.

**Results:** The RV database contains almost three years of data analyzing approximately 1,500 cases, equaling 0.75% of our annual ED patient volumes. RVs have higher acuity scores on both their index and return visit ( $P = 0.001$ ) and children under 12 months of age have significantly higher rates of return (24% vs 16%,  $P < 0.001$ ). A consultation service was involved during 31% of the index ED visits, with the top three consultants being Hematology/Oncology (23%), General Surgery (12%), and Neurology (8%). The root cause of the majority of RVs were related to disease progression (65%), while 8% were call-backs for positive blood cultures or discrepant results, and 6% were categorized as a misdiagnoses. Completed quality improvement initiatives to date include the ED Sickle Cell Optimization Program, the Culture Follow-up and Escalation Algorithm, and the Young Infant Fever Pathway and Order Set. **Conclusion:** Routine monitoring and investigation of ED RVs provides a proactive approach to seeking improvement opportunities. With a better understanding of specific patient and visit-level factors associated with RVs, future system-level quality improvement initiatives can be targeted.

**Keywords:** return visits, quality improvement, pediatrics

### P035

#### Development of a province-wide audit program for return visits to the emergency department

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**Introduction:** Routine auditing of charts of patients with an emergency department (ED) return visit (RV) resulting in hospital admission can uncover quality and safety gaps in care. This feedback can be helpful to clinicians, administrators, and leaders working to improve clinical outcomes, increase patient satisfaction, and promote high-value care. Health Quality Ontario (HQO) has been tasked by Ontario's Ministry of Health and Long-Term Care (MOHLTC) to manage the newly created ED RV Quality Program (RVQP), which mandates EDs participating in the Pay-for-Results (P4R) program to audit a minimum of 25-50 RVs/year. The goal of the first-ever ED-specific province-wide Quality Improvement (QI) initiative of this kind is to promote a culture of QI that will lead to improved patient care. **Methods:** Participating hospitals receive quarterly confidential reports from Access to Care (ATC) that show their and other hospitals' rates of RVs, as well as identifying information for patients meeting RV inclusion criteria at their ED (within 72 hrs of index visit, or within 7 days with specific diagnoses). HQO has partnered with QI experts and ED physician-leaders to develop various guidance materials. These materials have been disseminated through various media. Hospitals are