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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

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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.