

# *Lifelong Learning*



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## *Medical Education Research and Scholarship Day 2018*

### *Abstracts*

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## **A qualitative analysis of expert interviews to identify quality indicators for health professions education videos**

Jesse Leontowicz

College of Medicine

Co-Author(s): Jocelyn Andruko, MD - FRCPC Resident, University of British Columbia; Isabelle Gray-Colmers, MD - Attending, University of Alberta; Sean Tackett, MD - Attending, Johns Hopkins University ; Jillian Karpysyn - Medical Student, University of Alberta; Brent Thoma, MD, MA - Attending, University of Saskatchewan

**Introduction:** Educational videos have become readily available as modern technology has made video recording, editing, and hosting broadly accessible. Medical instructional videos that demonstrate physical exam maneuvers and medical procedures can be especially valuable as initial exposure or refreshers for these skills. However, despite an abundance of existing procedural videos, there are no established measures of quality exist to guide their appraisal or creation. An initial literature review found a paucity of articles outlining any quality indicators for these resources. The lack of literature on this topic has implications for educators, who do not have formal guidance on how to make a high quality resource, and learners, who may not be equipped to assess the quality of these resources. Our study sought to identify features that improve the quality of procedural and physical exam videos through a qualitative analysis of interviews of expert medical video producers.

**Methods:** Semi-structured interviews were conducted with a group of expert producers of medical videos who were identified using a snowball sampling technique. Field notes were recorded during the interviews and were used for the qualitative analysis. When there was a lack of clarity regarding the field notes, interview audio recordings were reviewed. A simple thematic analysis was performed to identify a list of key themes for procedural and physical exam videos.

**Results:** 28 experts from four countries identified through the snowball sampling technique were contacted to participate in our study. 14 were interviewed. The thematic analysis of the field notes identified multiple themes for procedural and physical exam videos. High quality features included: voice narration in a clear accent, compatibility of the video with mobile devices, explicit identification of the intended audience, clear objectives, and a length of <2 minutes. Poor quality features included: voice narration that was difficult to understand, poor camera angles, poor lighting, and distracting background noise.

**Conclusions:** Using a thematic analysis of transcripts from expert video producers, multiple features of high and low quality medical videos were identified. These findings should guide the production and evaluation of these resources.

## **An Anesthesiology Competency by Design (CBD) Boot Camp: Content, Delivery, and Evaluation**

Jennifer O'Brien

College of Medicine

Co-Author(s): Dr. Mateen Raazi, Provincial Head, Department of Anesthesiology, College of Medicine; Dr. Jennifer O'Brien, Research Coordinator & Professional Affiliate, Department of Anesthesiology, College of Medicine; Dr. Ian Jorgensen, Program Director, Department of Anesthesiology, College of Medicine; Tanya Robertson-Frey, Program Evaluation Specialist, Postgraduate Medical Education, College of Medicine

**Purpose:** Anesthesiology was the first large specialty to implement the Competence by Design model, beginning July 1, 2017. We evaluated the effectiveness of Boot Camp learning sessions (individually and as a whole) during the Transition to Discipline (TTD) stage of training.

**Methods:** New residents at our university spent the first 8 weeks of residency in an Anesthesiology Boot Camp, where they were introduced to the foundations of anesthesiology through 2-3 academic days/week dedicated to core topics in the practice of anesthesiology. Remaining days were spent in clinical anesthesiology training. The Program Director and the Director of Medical Education, in consultation with faculty, medical educators, and residents, developed a framework of essential topics. Session facilitators developed the content to transition medical students to anesthesiology residents. This content included interactive learning sessions, full day anesthesiology-specific simulations, half-day interdisciplinary simulations, and facilitated sessions with academic advisors. Participants were asked to complete evaluations of each session, and a final evaluation at the end of the Boot Camp. Categorical variables were tallied. Qualitative comments will be used to inform the future content of the Boot Camp.

**Results:** One hundred and forty-two individual session evaluations and 5 final evaluations were returned. Participants reported increased knowledge ( $p < 0.001$ ) between formative and summative session evaluations. The majority of residents (62%, 84/135) reported being Very Comfortable or Somewhat Comfortable applying the information from individual sessions. Interactive learning sessions and full day anesthesiology-specific simulation sessions were rated as Very Helpful or Helpful by all participants ( $n=5$ , 100%). Half day interdisciplinary simulation sessions were rated as Helpful or Very Helpful by most participants ( $n=3$ , 75%). Helpfulness of the academic advisors showed wide variation. Qualitative comments suggested improvements to ordering and content of sessions.

**Conclusion:** Our study contributes an original model for content, delivery, and evaluation of an Anesthesiology Boot Camp.

## **An exploration of problems encountered by residents in the CanMEDS roles**

Ope Okunola

College of Medicine

Author(s): Okunola, O., PhD, Coordinator: IMG program and educational programs, PGME, College of Medicine, University of Saskatchewan; Desanghere, L., PhD, Research Assistant, PGME, College of Medicine, University of Saskatchewan; Saxena, A., MD, M.Ed., MBA. Associate Dean, PGME, College of Medicine, University of Saskatchewan

**Background:** Competency-based medical education in Canada involves assessing residents in multiple roles and competencies, as articulated in the CanMEDS framework. The purpose of this study was to explore the problems most commonly encountered by residents in the CanMEDS roles, as documented in six-month assessment reports.

**Methods:** 684 six-month assessments reports of residents at the University of Saskatchewan (2010 to 2016) were reviewed for trainees who had 'below expectations' assessments in one or more CanMEDS roles. Residents were grouped into Surgical, Other specialties, and Family Medicine. Frequency of below expectation assessments are represented using percentages, major themes from the open-ended comments documented in the assessments are listed after each role.

**Results:** Eighty-eight residents had 'below expectations' assessments in one or more CanMEDS role/s. The most frequently documented problems were in the Medical Expert (42%; clinical reasoning and decision making, clinical knowledge and skills, technical and procedural skills), Communicator (17%; interaction with patients and families, written communication), Professional (16%; responsibility and commitment, self-assessment), and Leader (11%; management of career and practice) roles. The most common documented problems in different residency program groups included: Surgical- Medical Expert (34%), Scholar (21%), and Leader (16%); Other specialties- Medical Expert (27%); Professional (21%), Communicator (19%), and Leader (19%); Family Medicine- Medical Expert (55%), and Professional (25%).

**Conclusion:** This study provides insight into specific CanMEDS competencies that some residents might require additional help. Results will inform the development of appropriately-directed generic and specialty-specific programs aimed at resident success especially at the transition to discipline phase of residency.

## **An international, interprofessional investigation of the podcast listening habits of emergency clinicians: A METRIQ Study**

Scott Goerzen

College of Medicine

Co-Author(s): Dr. Brent Thoma, University of Saskatchewan, Dr. Tim Horeczko, Harbor-UCLA Medical Center Dr. Jeff Riddell, University of Southern California, Dr. Damian Roland, University of Leicester Dr. Andrew Tagg, Western Health ED, Dr. Teresa Chan, McMaster University, Dr. Annet Alenyo Ngabirano, JDEM UCT/Stellenbosch University, Dr. Katie Knight, Imperial College Healthcare NHS Trust, Dr. Stevan Bruijns, University of Cape Town

A broad range of emergency medicine clinicians utilize podcasts to facilitate and supplement learning. The aim of this study is to determine how and why podcasts are used so that further research can be done to determine their ideal role in health professions education. A survey was designed using FluidSurveys software to elicit the many ways that podcasts can be used by emergency medicine clinicians. An international sample of medical students, residents, physicians, nurses, physician assistants, and paramedics were recruited following the METRIQ methodology. This includes the use of multiple modalities which leveraged the Free Open Access Medical Education (FOAM) virtual community of practice, social media (Twitter and Facebook) and direct contact from our international authorship group. Participants were emailed a link to the study survey. The native FluidSurveys reporting software was then used to analyze the data. 397 participants from 34 countries and 4 professions (medicine, nursing, paramedicine, physician assistant) responded to the study. Approximately half (45.8%) of the participants used podcasts weekly. They were used to learn core material (75.1%), refresh memory (72.3%), or review new literature (75.8%). Most respondents listened on iPhones (61%) and the native Apple App (66.1%). The preferred Android app was Pocket Casts (22.8%) or Google Play (18.5). Many participants listened to podcasts while driving or commuting to work (72.3%). They rarely utilized active learning techniques such as pausing, repeating segments, or listening to a podcast more than once. This is the first report describing how and why medical education podcasts are used by emergency medicine clinicians. The study will inform future research investigating the impact of various listening habits (e.g. conducting other activities while listening, listening at increased speed, etc) on retention. Further analysis of the data to elucidate differences in listening habits between participants at different levels of training and professions.

## **Appreciative inquiry based improvement efforts in a residency training program**

Marla Davidson

College of Medicine

Co-Author(s): Dr. Anurag Saxena, College of Medicine, Department of Pathology, Associate Dean Postgraduate Medical Education, Faculty Loni Desanghere, College of Medicine, PGME Research

**Purpose:** A common approach to quality improvement is to focus on identifying weaknesses in order to “fix” deficiencies. Appreciative inquiry (AI) is a model of change that focuses on the strengths by utilizing techniques to clarify goals, design future states and develop action plans to lead change. The effectiveness of AI for program improvement was evaluated within the University of Saskatchewan Psychiatry Residency program.

**Methods:** Forty-nine faculty and residents participated in semi-structured interviews utilizing structured questions to guide them through the 4 phases of the AI cycle. Their personal reflections were then shared to identify key themes within the group. Finally, participants evaluated the effectiveness of the AI process using a 5-point likert scale and providing qualitative comments.

**Results:** The outcomes of the session included the development of an action plan by the group, which identified key themes and priorities for change within the program. Key priorities for change included protected learning time for residents, integrative dynamic case discussions, fostering teaching/learning, and regular feedback. The evaluation ratings for using AI as a technique to foster change were good-to-very good. Participants felt both faculty and residents were engaged in the process, with the goals of both the session and participants met by the AI format.

**Conclusion:** Appreciative inquiry is an effective tool to lead change that fostered a sense of collaborative ownership for the program. Individuals were engaged in the process and have worked collaboratively to implement changes toward the goal of making the residency program the best it can be.

**Canadian Institute for Health Research Grant "A systems approach for enhancing perinatal care regionalization" 5-year Grant - Currently Ongoing**

Roxanne Laforge

College of Medicine

National Grant including 66 Principle Authors and Collaborators.

Nominated Principle Applicant: Dr. K. S. Joseph Professor, Obstetrics & Gynaecology and School of Population and Public Health, University of British Columbia.

Co-authors / Team Members from Saskatchewan: Roxanne Laforge, RN, BScN, MS Coordinator, Perinatal Education Program Division of Continuing Medical Education, College of Medicine and Continuing Education and Development, College of Nursing, University of Saskatchewan Role: Principle Knowledge User Dr. George Carson, MD, FRCSC Professor, Maternal Fetal Medicine Department of Obstetrics & Gynaecology University of Saskatchewan Role: Principle Applicant Leah Thorp, RN, MN, PNC(c) Perinatal Outreach Education Program Saskatchewan Health Authority (Regina) Role: Collaborator

Canadians benefit from an excellent perinatal health care system. However, some problems persist as evidenced by disparities in illness and death among mothers and babies, and unfavourable international comparisons. Thus, rates of serious illness/death among mothers and babies vary significantly by region, socio-economic status, rural vs urban residence, Aboriginal status and other factors. The single biggest challenge confronting the perinatal health care system in Canada relates to regionalization of perinatal care i.e., receipt of the appropriate level of care based on the risks faced by the mother/baby. This problem is highlighted by maternity services in rural regions of Canada - the closure of small hospitals has resulted in the need for low-risk pregnant women to travel long distances for childbirth. Problems also exist in high volume/intensity regions such as the Greater Toronto Area where inadequate tertiary capacity dictates that high-risk women deliver in non-tertiary settings. Other challenges include those due to geography, climate, emergency transport, organizational issues, and the absence of evaluation and monitoring of regionalization. We propose to use a systems approach for evaluating the structure, processes and outcomes of regionalized perinatal care. Such a critical analysis will assess perinatal care regionalization in terms of hospital services, care provision in rural and remote communities and emergency transport. We will also use mapping of travel times from maternal residence to hospital and other novel techniques to rationalize the delivery of maternity/newborn care services. The results of this critical analysis will be used to formulate recommendations in collaboration with provincial/territorial Perinatal Care Programs and Ministries of Health. Implementation of recommendations will also be carried out in close collaboration with provincial/territorial stakeholders.

**Objectives include:** 1. To critically analyze the provision of perinatal health services in Canada using a systems approach in order to enhance regionalization of perinatal care. 2. To collaborate with each province/territory to develop evidence-based recommendations for improving perinatal health care. 3. To collaborate with each province/territory to implement the recommendations made.

## **Competency-Based Medical Education: Resident perspectives on Teaching and Learning the CanMEDS roles in Family Medicine and Specialty Programs**

Betty Rohr

College of Medicine

Co-Author(s): Loni Desanghere and Anurag Saxena

**Introduction:** Competency-based medical education (CBME) is a multi-year change initiative launched by the national colleges; the Triple C curriculum by the College of Family Physicians of Canada and the Competence-By-Design (CBD) initiative by the Royal College of Physicians and Surgeons of Canada. The individual competencies in medical expert and intrinsic domains are utilized to design curriculum and assess competence. The purpose of this project was to explore resident perceptions on the optimal way(s) to integrate CanMEDS roles in their learning.

**Methods:** In 2016, 332 residents completed an online survey which asked them about barriers/challenges and the best ways to teach and learn the CanMEDS roles. Content analysis was performed on the open-ended responses, frequencies and chi-squared analyses were performed on the data to examine trends.

**Results:** There were barriers and challenges common to teaching and learning all roles, these included 1) the CanMEDS roles are not being formally/explicitly taught, 2) system and culture of medicine: protocols and processes, 4) time/workload, and 5) resources/infrastructure and supports. Role specific challenges were also discussed, e.g., health advocate: challenges due to lack of cultural understandings and limited awareness of community relationships. Respondents offered several ideas on how to best teach and learn the CanMEDS roles. These ranged from continuing certain practices (curriculum, M&M rounds, journal club) and revising or completely revamping others (i.e., academic half days, and handover).

**Conclusions:** Each CanMEDS role is unique in its characteristics, however their utility in clinical practice reflects their interdependent nature, with many common challenges/barriers in teaching and learning the roles. With on-going implementation of CBME, gaining stakeholder insight into the best ways to teach and learn the various roles, along with associated challenges, is paramount to success.

## **Development of visual diagnostic skills in veterinary students using a fine arts intervention**

Nicole Fernandez

Western College of Veterinary Medicine

Co-Author(s): Ryan M Dickinson and Melissa Meachem, Assistant Professors; Hilary Burgess, Clinical Associate; WCVN, Dept of Vet Pathology; Marina Fischer, Collection Specialist, Nickle Galleries, University of Calgary; Catherine R Wagg, Senior Instructor; Amy L Warren, Associate Professor; University of Calgary, Faculty of Veterinary Medicine, Dept of Vet Clinical and Diagnostic Sciences

**Background:** Visual diagnostic skills are essential for success in veterinary medicine and are used daily in many aspects of practice, for example, physical exam, radiology, hematology, and cytology. Veterinary students are expected to develop these skills, however, they are not usually an explicit part of the curriculum. Art observation training has been shown to improve medical students' visual diagnostic skills. The impact of art-based observational training has not been investigated in veterinary students or in the discipline of clinical pathology.

**Objective:** To compare the effectiveness of art-based and traditional pathology-based interventions in developing visual diagnostic skills in cytology.

**Methods:** Second year veterinary students enrolled in Clinical Pathology were divided into 2 groups. Group A learned to describe cytology samples with a board-certified clinical pathologist (RMD). Group B learned to describe paintings and other works of art with an art historian (MF). Both groups completed a pre-test before their sessions, in which they described digital images of 2 cytology samples and 1 painting. Both groups completed a similar post-test immediately following their sessions, and an additional post-test approximately 4 weeks later. Before the final post-test, both groups participated in laboratory sessions involving digital and microscopic evaluation of cytology samples. Pre- and post-tests will be scored following a rubric based on expert descriptions of the images.

**Results:** Student descriptions will be scored once the final grades for the course have been submitted. We anticipate that scores on the immediate post-test will be higher than on the pre-test. We are eager to see if there are any meaningful differences between Group A and Group B and if scores will continue to improve in the final post-test, after students have more experience with cytology.

**Conclusion:** We hope to demonstrate whether visual diagnostic skills in cytology are improved by a fine arts intervention.

## **Does the Use of 3D Images Reformatted from an Anatomage Table Enhance Learning of Anatomy versus 2D Images?**

Soo Kim

College of Medicine

Co-Author(s): Katie Croquette, College of Medicine, School of Rehabilitation Science, Clinical Faculty, B.Sc., MPT, PhD Brent Burnbridge, College of Medicine, Department of Medical Imaging, MD, FRCPC Stacey Lovo Grona, College of Medicine, School of Rehabilitation Science, BScPT, PhD candidate

**Introduction:** Biomechanical assessment and treatment skills taught in the musculoskeletal courses for physical therapy (PT) students require an in-depth understanding of human anatomy. Traditionally, instructors have used images from anatomy textbooks to review the relevant body region of focus. The Anatomage Table is a fully segmented, real human, anatomy teaching system that many programs use to teach anatomy. Individual anatomic structures can be reconstructed in 3D. To date, use of the Anatomage Table to review the relevant anatomy within our PT courses has not been explored.

**Purposes:** To explore an innovative use of the Anatomage Table outside of the anatomy course in the PT program and to investigate whether students' use of 2D anatomy images translated to both 2D and 3D anatomical knowledge.

**Materials and Methods:** Thirty-nine PT students participated. Four separate anatomy tests, focusing on different body regions, were given (shoulder, elbow, cervical spine, and wrist and hand). Prior to each test, images from an anatomy textbook relevant to the body region to be studied were posted. Each student was asked to take two versions of the test: traditional paper test with 10-12 labelled structures to be identified and a 3D video test where 10-12 short (20 sec) dynamic, labelled, video clips were presented to the class with students asked to identify labelled anatomy. The 3D test was always administered first.

**Results:** Scores on the 3D tests were significantly lower than the traditional 2D test. For particular body region tests, statistically significant differences were found for the elbow and cervical spine.

**Conclusion:** Findings suggests learning from static images may not carry over to being able to identify the same anatomic structures in 3D. Providing more 3D resources and integrating more 3D dynamic anatomy into courses where a strong appreciation for spatial relationships is needed may be an effective teaching practice.

## **Does video based teaching increased students performance and long term retention of the hand exam?**

Jessica Littmann

College of Medicine

Co-Author(s): Dr. Chris Thomson, MD FRCSC, College of Medicine, Division of Plastic and Reconstructive Surgery, Faculty

**Purpose:** Advances in technology and the Internet have changed education and learning and have provided different medias by which students can learn. Video instruction allows students to learn at a pace that meets their learning needs. As the challenges of delivering undergraduate medical curriculum grow, video based learning may present an effective means of imparting knowledge. To our knowledge, no studies have looked at teaching students a basic hand exam using video-based learning. The hand exam is one area that is allotted few hours in medical school curriculum, but is a fundamental skill as hand complaints are common in a wide variety of specialties. The goal of this project is to create a hand exam instructional video for medical learners and to assess if it is an effective means of teaching a basic hand exam.

**Methods:** Thus far we have created a video featuring the basic hand exam as demonstrated by Plastic and Reconstructive surgeon, Dr. Chis Thomson. The plan moving forward is to recruit pre-clerkship medical students into either a control group or intervention group. The control group will receive the standard teaching regarding the hand exam. The intervention group will receive the standard teaching, plus have the opportunity to view the video. The primary outcome that we will be assessing is whether supplementation with video based learning will increase student's performance and long-term retention of the basic hand exam.

**Results & Conclusion:** Currently this study is a work in progress and no results or conclusion are available.

## Evaluating Clinical Competence Committees Decision-Making Process: Describing a Logic Model

Heather Ward

College of Medicine

**Purpose:** Clinical Competence Committees (CCC) are tasked with evaluating resident progression through defined phases of training, as gatekeepers for transition to independent practice, and identifying resident learning needs. Decisions made by CCC need to be valid, reliable, and evidence-based for both resident and faculty engagement in the assessment process and for social accountability of medical education. Evaluation of CCC decision-making includes a review of the quantity and quality of assessment data provided and of the decision-making process itself. Initial publications on CCC decision-making propose a theoretical framework consisting of schema orientations (decision-making algorithms), constructivism (development of a shared mental model of resident performance) and social influence (small group dynamics) as overlapping components. Decision-making modifiers include guidelines, leadership, and time. The purpose of this study is to develop a logic model inclusive of data quality for decision-making, the influence of defined moderators, and utilizing the proposed decision-making theoretical framework to evaluate CCC tasks.

**Methods:** This project is a work in progress applying a review of current literature to develop a logic model evaluating the function of CCC at the University of Saskatchewan. Stakeholders include participating CCC, program directors, faculty, residents, and PGME will participate in the logic model development and its application for implementation and ongoing evaluation of CCC function.

**Results:** Study results will contribute to CCC faculty development, resident engagement, feedback on current assessment tools, and current policy. Contributions to the literature will continue to validate the proposed theoretical framework of CCC decision making

**Conclusions:** CCC have been tasked with providing valid and evidence-based decisions of resident acquisition of competencies necessary for independent practice. Ongoing evaluation of CCC process including assessment data and group decision-making is necessary for CCC to effectively meet their defined tasks.

## **Feedback-seeking behaviors: Perspective from program directors, program administrative assistants and residents.**

Loni Desanghere

College of Medicine

Author(s): 1. Desanghere, L., PhD, Research Assistant, PGME, College of Medicine, University of Saskatchewan 2. Saxena, A., MD, M.Ed., MBA. Associate Dean, PGME, College of Medicine, University of Saskatchewan

**Purpose:** On-going transitions to competency-based medical education require specific, authentic and timely feedback from the preceptors and an increase in feedback-seeking behaviors from residents. The purpose of this project was to gain insight from program directors (PDs), program administrative assistants (PAAs) and residents on feedback-seeking behaviors.

**Methods:** 44 participants (9 PDs; 18 PAAs; 17 CRs) were surveyed in 2016, an additional 139 residents were sampled in 2017. Participants provided input on feedback-seeking behaviors, including the frequency, negative and positive perceptions, encouragement within the program, and the key competencies feedback is/should be sought out. Both quantitative and qualitative methods were used in data analysis.

**Results:** 54% of participants indicated that residents very infrequently/never/not to their knowledge seek additional feedback; 21% indicated that this behaviour was only observed if the resident had identified problems. 25% of respondents indicated that feedback seeking behaviour occurs frequently with most residents. Although some participants indicated “no” negative associations with feedback seeking behaviour, some negative perceptions included reduced confidence or being seen as needy as well as concerns with preceptor’s lack of time (and motivation) to perform additional evaluations. Positive perceptions included residents perceived as motivated, to learn and excel, engaged, teachable and confident. Finally, differences were observed between groups on the frequency of feedback seeking behaviours across the CanMEDs roles, CRs believed that residents were seeking less feedback in the Medical expert role. As well, PAAs perceived more feedback seeking behaviour in the collaborator and health advocate roles, when compared to PDs and CRs who did not believe this to be true ( $p < .05$ ).

**Conclusions:** Feedback in medical education is an integral component to positive learner outcomes. These results highlight a need to promote a culture of feedback-seeking behaviors across programs and key stakeholders. These results were used to inform on-going educational initiatives at the University of Saskatchewan.

## Individual and Collective Change Efficacy for Competence by Design (CBD) Implementation

Megan Deck

College of Medicine

Co-Author(s): Betty Rohr, PhD, Postgraduate Medical Education (PGME), Education and Metrics Coordinator, Faculty, Anurag Saxena, MD MEd MBA FRCPC FCAP CHE CCPE, Postgraduate Medical Education (PGME), Department of Pathology, Professor and Associate Dean, Faculty

**Background/Purpose:** Strategy for organizational readiness for change is an important component within change management theory. Change efficacy refers to organizational members' shared beliefs in their collective capabilities to organize and execute the courses of action involved in change implementation. Organizational change implies complexity and occurs at multi-levels. Therefore, it is important to also capture the individual level of efficacy (i.e., self-efficacy). This study sought to evaluate CBD training on CBD self-efficacy and CBD collective efficacy as well as explore the relationship of these variables with participants' perception of the organizations readiness for change.

**Methods:** During a workshop to prepare a program for CBD implementation, specific sessions including experiential learning were offered on the rationale, deconstructing EPAs, and providing daily feedback and a simulation exercise. Twenty-one participants (19 faculty and 2 administrative staff) were surveyed using pre and post measures of self-efficacy, collective efficacy and organizational readiness. Quantitative methods were used for descriptive and comparative analysis.

**Results:** Across most items, there was an increase in the rating of items post-sessions. Three items (related to CBD terminology, assessment processes, and CBD Knowledge rating) were significantly higher ( $p < 0.05$ ). Items that were noticeably similar upon post-workshop were related to resources needed for change, confidence in past experiences, having skills needed, and ability to learn everything needed for the change.

**Conclusions:** The results will help us determine areas of strengths and weaknesses in the training program to inform the development of future training needs. Results point to aspects of CBD training that can be supported in a regular workshop, in particular rationale, terminology, and processes. Areas that will require more long-term development include confidence in the resources and development of the skills needed.

## **Integration Of Feedback Into Clinical Practice By Resident Doctors**

Jonathan Dean

College of Medicine

Co-Author(s): Dr. Taylor Bereti, Department of Surgery, Resident Doctor, Dr. Heather Ward, Division of General Internal Medicine, Faculty, Dr. Sharon E. Card, Division of General Internal Medicine, Faculty

**Purpose:** Regular clinical feedback is a key part of competency-based medical education. Yet, how resident doctors think about and use feedback to change clinical practice is unclear. Understanding this process may improve the usefulness of suggestions residents receive and assist in design of faculty development tools. Our study first explored residents' use of feedback through individual interviews, with the plan to triangulate findings through focus groups.

**Methods:** Resident doctors from Royal College-accredited programs in Saskatchewan were invited to participate in individual, semi-structured interviews. Participants were asked pre-defined questions around feedback from supervising physicians. Responses were transcribed and analyzed thematically, and recruitment was concluded at thematic saturation. We will further recruit Royal College residents, that have not yet participated in the study, to three focus groups. Open-ended questions will prompt discussion around themes revealed through individual interviews. Focus group discussions will be analyzed thematically, then compared to those from the interviews.

**Results:** Twenty residents (15 medical, 5 surgical) participated in interviews. One dominant theme was the importance of feedback credibility. Residents weighed suggestions around personal values, supervising physician factors, and qualities inherent to the feedback itself. If the feedback was considered sufficiently credible, residents used it in a variety of ways. This included an immediate re-evaluation of one's clinical approach, or later recalling and using feedback at the next relevant clinical event. There was no consistent approach by which residents evaluated the success of their integration of feedback. Interview findings will be further explored through focus groups.

**Conclusion:** Our ongoing study emphasizes the importance of feedback credibility and suggests that patterns for thinking about and utilizing feedback exist. Understanding how residents use feedback is important for development of best-practices for faculty development. Future implementation of a quick-reference tool may help faculty give more easily integrated suggestions to residents during feedback encounters.

## **Learning from the Learners - Aiming to Smoothly Transition to Competence by Design (CBD).**

Sharon Card

College of Medicine

Co-Author(s); Robertson-Frey, T. (PGME); Desanghere, L. (PGME); Rohr, B. (PGME); Elliott, M (Resident); Jalbert, R (Resident); Saxena, A. (PGME)

**Purpose:** One of the key educational pillars of competency based medical education (CBME) is a focus on learning through experience, with a culture (direct observation and coaching feedback) that facilitates the developmental acquisition of competencies. To enable successful implementation of this philosophy of CBME, learner engagement in the transition to Competence By Design® (CBD) is crucial. The purpose of this project was to gain an understanding of learner needs to inform CBD implementation locally.

**Methods:** The University of Saskatchewan CBD Learner Development working group developed focus group questions around knowledge, benefits and challenges of CBD as well as how to best ensure residents successfully transition to CBD. Residents from each of the provincial 24 RCPSC residency programs were invited to participate in the focus groups, scheduled during their respective academic half days. A total of 14 focus groups, with approximately 150 residents were carried out between July and September 2017. Transcript-based analysis was conducted. Responses to each of the questions were coded thematically using the qualitative software NVivo (version 11.4.1).

**Results:** The thematic responses allowed five key recommendations to be developed by the CBD Learner Working Group: (1) Transition CBD Learner Working Group to a CBD Resident Lead group. (2) Support a shift to learner focused learning via a coaching model. (3) Address resident concerns regarding supervision and assessment. (4) Address myths and misunderstandings of CBD. And (5) Increase resident knowledge of CBD.

**Conclusion:** To facilitate implementation of effective CBME learner engagement, changing to a learner driven educational model is needed. By learning from the learners themselves about their needs, we were able to determine five key recommendations to assist in this process. Future research will focus on the effectiveness of outcomes of this co-creation process.

## **Living in a virtual reality – a cross-over study comparing resident examination performance with traditional and virtual microscopy**

Alicia Andrews

College of Medicine

Co-Author(s): Nick Baniak, University of Saskatchewan, College of Medicine, Department of Pathology and Laboratory Medicine, Resident, Catalin Taraboanta, University of British Columbia College of Medicine, Department of Pathology and Laboratory Medicine, Resident, Amy Bromley, University of Calgary College of Medicine, Department of Pathology and Laboratory Medicine, Faculty, Tyler Hickey, University of British Columbia, College of Medicine, Department of Pathology and Laboratory Medicine, Faculty, Marilyn Kinloch, University of Saskatchewan College of Medicine, Department of Pathology and Laboratory Medicine, Faculty

**Introduction:** Digital images (static images and virtual microscopy) are becoming commonplace in pathology resident evaluation. The Royal College of Physicians and Surgeons of Canada changed their pathology examinations to an all-digital format in 2017, and many residency programs utilize digital images for internal examinations. The skills for evaluating virtual and glass slides are different, and concerns have been raised as to whether virtual microscopy-based examinations yield representative evaluations of residents. We hypothesize that there is no difference in resident performance between the two modalities, given that overall their similarities outweigh their differences.

**Purpose:** To compare pathology resident performance in traditional versus virtual microscopy examinations.

**Methods:** Residents from all post-graduate years, at three Canadian pathology residency programs, participated in this cross-over study. Sites were assigned to either traditional or virtual microscopy for the first of two slide examinations (25 slides, two minutes per slide). For the second sitting, the examination modalities were reversed. The data from each sitting were analysed by Wilcoxon Two-Sample Test, using SAS 9.4.

**Results:** Twenty-nine residents sat the first examination: 11 virtual (mean score 9.5/25, SD 4.3) and 18 traditional (mean score 11.8/25, SD 6.0),  $p = 0.38$ . Twenty-eight residents sat the second examination: 16 virtual (mean score 11.1/24, SD 4.9) and 12 traditional (mean score 12.2/24, SD 4.9),  $p = 0.40$ . All score distributions were non-Gaussian.

**Conclusions:** Our study shows no statistical difference in resident performance when examined using glass slides or virtual microscopy. This finding supports the use of digital images for resident evaluation.

## **Resilience, well-being and quality of life: Informing wellness initiatives in medical education**

Madeline Collins

College of Medicine

Co-Author(s): Desanghere, L., PhD, Research Assistant, PGME, College of Medicine, University of Saskatchewan; Saxena, A., MD, M.Ed., MBA. Associate Dean, PGME, College of Medicine, University of Saskatchewan

**Introduction:** Medical student's mental health typically deteriorates throughout the course of medical school, and studies show an increased incidence of anxiety, depression, and burnout among this population. Overall, high resilience is associated with better well-being, highlighting it as an important component in the wellness of students. The purpose of this project was to explore resilience and well-being, along with key factors that promote mental health in undergraduate medical students in Saskatchewan.

**Methods:** Seventy-nine participants (47 females) completed an online survey. Measures included professional quality of life, Cantril well-being, ego-resiliency, and GRIT. Open-ended questions explored factors contributing to wellbeing. Data were analyzed using SPSS statistics and NVIVO software.

**Results:** Medical students who reported better health status had higher resilience, higher compassion satisfaction, lower burnout, better well-being, and increased perseverance. Resilience was found to be associated with higher compassion satisfaction, lower burnout, more perseverance and effort, and higher levels of well-being. There were no differences between gender or medical school year for any of the measured variables. Students identified maintaining physical health (39%), engaging in mental health practices (29%; e.g., positive mind set) and maintaining work-life balance (20%) as working best to maintain well-being.

**Conclusions:** The results from the study lend insight into how well-being is influenced in undergraduate medical students, as well as important factors which threaten mental health in this population. Our results highlight the promotion of well-being and resilience training as potential targets in medical education as to reduce burnout and improve overall wellness from holistic perspectives.

## **Review of Canadian Resources and Development of a Web-based Interactive Hematology Teaching Tool for Undergraduate Medical Students**

Armin Moradi

College of Medicine

Co-Author(s): Dr. J. Stakiw MD, Faculty Supervisor, Saskatchewan Cancer Agency, Dr. K. Brose MD, Faculty Supervisor, Department of Hematology Oncology

**Objective:** A Persistent gap has been identified in the use of software technology in self-directed learning pertaining to the availability of practice materials as applicable to Hematology medical education. The objective of the current investigation was to further qualify this deficiency, and develop an innovative software approach to fill the present gap.

**Method:** A thorough review of the currently available software projects was undertaken, focusing on the applicability of each project to self-directed learning and its potential impact on student performance.

**Results:** The projects reviewed emphasized standalone didactic style learning and duplicated the efforts of educators in the classroom. Furthermore, it was found that the projects reviewed were either out of date, duplicated classroom effort with little added value, required extensive attention and care to be kept updated, or a combination thereof. In addition, for both projects, each case has to be manually curated by a subject matter expert, rendering the project impractical if a large number of cases were desired.

**Conclusion:** The authors have concluded that the current available software solutions for self-directed learning in Hematology do not take advantage of the capabilities of modern software paradigms and are not designed to address the shortage of practice cases. Therefore, a novel software solution was designed which addresses most of the flaws associated with the reviewed projects with far-reaching implications in accelerating the use of novel software solutions in medical education.

## **Review of North American resources and development of a novel software platform to enhance goal-directed experiential Ophthalmology training and assessment in the era of Competency Based Medical Education (CBME)**

Armin Moradi-Nowghabi

College of Medicine

**Objective:** A persistent gap has been identified in the available software solutions for Ophthalmology training and assessment across North America. The objective of the current investigation was to further qualify this gap and develop an innovative globally-aware software platform to enhance Ophthalmology CBME-based resident training.

**Methods:** A thorough review of the currently available software platforms was undertaken including OphthoQuestions(TM), BoardVitals(TM), and eyeQ(TM). Each platform was assessed and scored based on accessibility, customizability, epidemiological relevance, and maintenance.

**Results:** All platforms reviewed invariably emphasized independent topical review for the purpose of exam preparation and duplicated effort with minor variation. Additionally, solutions provided by both OphthoQuestions(TM) and BoardVitals(TM) were well-maintained and up to date with current North American standards. However, none were widely accessible due to cost, modifiable for different modes of training, or epidemiologically relevant for distinct global regions.

**Conclusion:** The currently available software solutions for Ophthalmology resident training and assessment are inadequate to address the needs of a customized yet globally-aware CBME curriculum. Therefore, a novel software platform was designed which addresses most of the flaws associated with the reviewed projects with far-reaching implications in Ophthalmology training and eye care around the world. The developed software platform is globally accessible with the capability to incorporate contributions from Ophthalmologists around the world. In addition, it is modifiable and adaptable to the training goals of each educational program or individual, epidemiologically relevant, and capable of sustainment through collaboration with the global Ophthalmology community.

## **Students' evaluation of a pre-clerkship community experiential learning module for appraising the social determinants of health**

Juan-Nicolas Pena-Sanchez

College of Medicine

Krista Trinder, Program Evaluation Specialist, Undergraduate Medical Education, College of Medicine, UofS, Krista Baerg, Associate Professor Paediatrics, College of Medicine, UofS, Erin Wolfson, Community Engagement Specialist, Division of Social Accountability, College of Medicine, UofS, Yuchen Gao, Ph.D. Candidate, Department of Sociology, College of Arts and Science, UofS, Jann Ticknor, Saskatchewan Indigenous Council Coordinator on HIV and AIDS, All Nations Hope Network, Ulrich Teucher, Associate Professor, Department of Psychology, College of Arts and Sciences, UofS

**Purpose:** The Community and Work Centred Learning Experience (CWCLE) module is an experiential learning module for second-year medical students at the University of Saskatchewan. We asked students to self-evaluate accomplishment of the learning objectives and appraise their attitudes towards the social determinants of health (SDOH) after completing the module.

**Methods:** A web-based survey was sent to two cohorts of students who completed the CWCLE in 2016-17 and 2017-18. The questionnaire included self-assessment of the six module objectives, evaluating their ability to perform each of the objectives before and after the module. The questionnaire also assessed attitudes towards SDOH and each of the module components. Paired and independent t-tests were used to compare differences in students' perceptions.

**Results:** From the 2016-17 cohort, 80 students completed the online questionnaire (response rate=80%). Students reported an enhanced ability to perform the module learning objectives after completing the CWCLE,  $p < 0.001$ . The largest improvement was observed on explaining how the community agencies address SDOH,  $p < 0.001$ . There was also an increment on the perception that people with low income or education are more likely to suffer from poor health,  $p = 0.001$ . There were no significant variations in the perceptions among other issues (e.g. smoking, housing, alcoholism, etc.). No significant differences were observed between students in Regina and Saskatoon. On a scale from 1.00-5.00, the satisfaction with the module had a mean=2.94 (SD=0.99) and median=3.00 (IQR=3.00-4.00). The online discussions (mean=2.12, SD=1.17) and 7-hours placement (mean=3.74, SD=1.12) were, respectively, the lowest and highest rated components. Students of the 2017-18 cohort are currently completing the evaluation.

**Conclusions:** The CWCLE had an impact on the ability of students to perform the learning objectives and their attitudes towards SDOHs, specifically income and education. Opportunities to improve the module were identified; although, further qualitative data is needed to collaboratively reform this community learning experience.

## **The CORAL Collection: a set of on-line, modifiable and expandable resources for leaders in medical education**

Marcel D'Eon

College of Medicine

Co-Author(s); Sean Polreis, U of S, Valerie Dory, McGill, Vanessa Anastasopoulos, McGill, Joanne Hamilton, U of M, Irene Ma U of C

**Purpose:** Leaders and decision-makers in medical education (chairs of committees and members – faculty, residents, and students; course, program, and rotation directors; and assistant deans) need important concepts and principles in education and cognitive science to be able to make informed decisions. While there are some workshops, short courses, and master’s programs available for people in these entry level roles these faculty development offerings require a considerable commitment and may not deliver manageable, just-in-time, role specific preparation and orientation.

**Approach:** We developed a set of Cells: publicly available, on-line, modifiable and expandable resources. Cells can be modified easily and additional Cells can be added as developed. Cells may be used independently, to “flip” workshops, for orientation to roles, or as parts of courses. A separate landing page explains the CORAL Collection and includes a Glossary that allows individuals to find Cells of interest. The design of the Cells is based on evidence informed approaches to learning. Each Cells includes an overview and rationale, clear objectives, self-assessment and engagement of prior learning, content delivery, application exercises with self-checking, program evaluation for each specific Cell, and a concept map of related Cells. Each Cell was reviewed by at least one independent expert and subject to editorial oversight. Authors and reviewers from across Canada have contributed and are contributing to the CORAL Collection. Cell topics were chosen by faculty development experts in the field.

**Conclusion:** The Cells of the CORAL Collection are designed to meet the faculty development needs of a specific population in an effective, versatile, and convenient manner.

## **Transitioning to Competence by Design: Determining Learner Needs**

Tanya Robertson-Frey

College of Medicine

Co-Author(s): Sharon Card, MD, Faculty, General Internal Medicine, CoM, UofS, Loni Desanghere, PhD, Research Assistant, PGME, CoM, UofS, Betty Rohr, PhD, Education and Metrics Coordinator, PGME, CoM, UofS, Mark Elliot, MD, Internal Medicine Resident, CoM, UofS, Rochelle Jalbert, MD, Internal Medicine Resident, CoM, U of S, Anurag Saxena, MD, Associate Dean PGME, CoM, UofS

**Introduction:** The Competence by Design (CBD) initiative launched by the Royal College of Physicians and Surgeons of Canada (RCPSC) aims to better align residency education with evolving societal needs by focusing on expected outcomes. Successful institutional implementation of CBD requires a shift to greater learner centredness. The purpose of this project was to gain a clear understanding of the needs of learners to inform CBD implementation.

**Methods:** Ten working groups were established within the college to initiate CBD implementation. The CBD Learner Working Group was tasked with examining learners' understandings about CBD. In particular, questions were asked in relation to knowledge of CBD, benefits, challenges, how to ensure a successful transition, and how to best communicate CBD information. Through 14 focus groups, perceptions of approximately 150 residents from all specialty programs across all training sites were explored. Transcript-based analysis was conducted, with responses to each of the questions coded thematically using the qualitative software NVivo (version 11.4.1).

**Results:** Supervision, assessment, and length of training emerged as key themes in relation to both benefits of CBD and concerns. As well, residents felt that faculty and resident training and having a clear implementation plan were needed to help ensure a successful transition. Lastly, most residents reported that they had little knowledge of CBD, that they would like more information and that their preferred method for receiving CBD information was through program-specific, interactive sessions.

**Conclusion:** The focus groups provided an opportunity to gain detailed feedback from residents regarding Competence by Design, focusing on their concerns and what they need to be successful during this transition. Results will guide the development of future educational initiatives that best meet the needs of residents.

## **U of S Faculty Development Program Evaluation Model**

Cathy MacLean

College of Medicine

Co-Author: Sean Polreis

**Purpose:** The purpose of this project is to create a framework that can be used to evaluate faculty development (FD) programming in the College of Medicine at the University of Saskatchewan.

**Methods:** Engaging with the Gwenna Moss Center, the Division of CME and using resources such as evaluation models from the current Continuing Professional Development literature, an external report on FD in the College of Medicine (CoM), our own FD matrix as well as the CoM Strategic Plan priority areas, we will outline a proposed framework for evaluating our overall FD program. This will include looking at the programming as a whole in response to defined needs (both perceived and unperceived) and will include a gap analysis for FD across the education continuum. We will also include a standardized approach to evaluate the various components or events that contribute to the overall program offered. Key performance indicators for FD defined elsewhere, metrics and accreditation requirements will be included in the framework that are particularly relevant to our setting and distributed model.

**Results:** The matrix has been drafted and is evolving but has not yet been tested. The framework is under development and is to be presented at the University of Toronto CPD Course in October, 2018.

**Conclusion:** Faculty Development as a program in the CoM requires ongoing evaluation in line with the CoM strategic plan and the direction of the Division of CME. Moving forward in 2019 with a new strategic plan for FD including development of certificates and a masters program, there will need to be an evaluation framework in place that is well informed and relevant to our context and priorities. This is a work in progress and we are interested early and frequent consultations as this framework evolves.

## **Understanding Learning needs of Physicians and Residents to Achieve Baby-Friendly Designation**

Krista Baerg

College of Medicine

Co-Author(s): Julie Smith-Fehr, SHA - Saskatoon, Maternal Services Amanda D. Loewy & Jill Blaser Farrukh, College of Medicine, Family Medicine

**Background:** The Baby Friendly Initiative (BFI) is a global strategy to protect, promote, and support breastfeeding. A future children's hospital is committed to achieve BFI designation within 1 year of moving into a new facility. To meet this goal, a BFI physician working group supports physician needs and includes representation from Family Medicine, Pediatrics, Neonatology and Obstetrics. Summary of

**Work:** Physicians and residents participated in a survey to identify learning needs with respect to achieving BFI status in the new hospital. The 11-item survey took less than 5 minutes to complete. The working group identified 18 potential physician learning needs required to promote and support breastfeeding. Participants rated importance of knowledge in each area and their confidence to manage.

**Summary of Results:** There were 95 participants from January 5-30, 2018. Ratings on a scale of 1 (Very Important) to 3 (Not Important) or 4 (Not Applicable) and confidence to manage on a scale of 1 (Very confident) to 3 (Not able to Manage) or 4 (Not Applicable) for each competency will be reported. Of learning needs rated among the top 5 most important, 85% of participants were confident to manage three: benefits of breastfeeding in neonates, informed choice when supporting newborn feeding, and medical contraindications to breastfeeding. Less than 25% indicated confidence to manage the other two: community resources for breastfeeding support and medical indications for supplementation. Less than 50% of participants reported confidence to manage key areas rated important or very important by more than 80% of participants: risk factors for delayed lactogenesis, what mom can do in pregnancy to promote milk production, neonatal abstinence syndrome, and how to promote a baby friendly office. Preferred modes of learning (choose all that apply) were Grand Rounds (54%, 51) and 15-minute modules (51%, 48). Interest in longer formats was limited as follows, ½ day workshop (35%, 33), 1-hour module (16%, 15) and full day workshop (14%, 13).

**Discussion & Conclusion:** Knowledge deficits are reported among family physicians, pediatricians, neonatologists and obstetricians in key competencies required to support and promote breastfeeding.

**Take-home Message:** Medical professionals require specific training in lactogenesis and breastfeeding.

## Using Web-Based Expert Study to Enhance Experiential Learning

Armin Moradi-Nowghabi

College of Medicine

Co-Author(s): Dr. K. Lyster MD, Dilawri Simulation Center, Supervisor, Dr. J. Crawford, Regina Qu'Appelle Health Region, Research Scientist

**Background:** Currently, immersive simulations and clinical scenarios are used to expose students to issues of problem-solving in the real world. While adequate, these methods require extensive capital, human resources, and careful planning which may not always be possible. Furthermore, the physical nature of the above teaching methods creates a discrepancy between education sites which is not desirable. We hypothesize that using Web-based technologies in conjunction with traditional simulation platform will have a synergistic effect on experiential learning and boost clinical competency and confidence of students.

**Methods:** A Web-based platform for presentation of nephrology clinical scenarios is generated. Subsequently, all interested second-year students at the College of Medicine are recruited and assigned to either of two groups: traditional nephrology simulation and interactive Web-based nephrology module plus traditional simulation. A pre-test determines desired outcomes (critical thinking, ability, satisfaction, and confidence) in each group. A post-test determines the same outcomes after exposure to simulation scenarios. The outcomes are compared to gauge the effectiveness of interactive Web-based nephrology module in enhancing experiential learning.

**Results:** A Web-based platform for presentation of nephrology clinical scenarios is generated and Initial qualitative testing has been satisfactory in terms of the topics covered and presentation of emergency cases for students. Data collection and analysis is not yet complete to establish quantitative measurement of the platform's efficacy.

**Conclusion:** Preliminary qualitative testing has shown great promise for our Web-based platform and its potential to improve experiential learning among medical students. No definitive conclusion can be derived at this point as the project is ongoing.

## **360-degree Video Modelling: An Instructional Tool for Central Venous Catheter Insertion**

Megan Deck

College of Medicine

Co-Author(s): Julie Yu, MD, Department of Anesthesiology, University of Saskatchewan Evan Mah, BScKin (Hons), College of Medicine, University of Saskatchewan Joanne Kawchuck, MD, FRCPC, Department of Anesthesiology, University of Saskatchewan Luke Terrett, MD, FRCPC, Department of Emergency Medicine, University of Saskatchewan Brent Thoma, MD, MA, MSc, FRCPC, Department of Emergency Medicine, University of Saskatchewan

**Purpose:** Central Venous Catheter (CVC) placement is a common resuscitative procedure performed by resident physicians, but learning the skill in clinical practice is problematic, as provider experience with insertion is inversely related to the development of iatrogenic complications. Simulation, which often utilizes traditional video modelling (VM) as an instructional adjunct, has been shown to improve the quality and success of CVC insertion, while promoting patient safety. The immersive experience of 360-degree video recording has been shown to improve recall and skill translation to the real-world environment, however its role as an educational tool within medical training is not well established. The purpose of this study is to determine whether the immersive perspective of 360-degree VM will improve procedural skill acquisition in medical residents learning ultrasound-guided CVC insertion, relative to traditional VM.

**Methods:** Forty-four resident physicians representing the disciplines of anesthesiology, general surgery, emergency medicine, and internal medicine will be consented to participate in this mixed-methods study. Participants will be randomized into traditional VM control or 360-degree VM intervention groups, and will watch their respective instructional videos. All participants will receive standardized instruction prior to performing CVC insertion on a task trainer during a video-recorded testing session. This procedure will be repeated over three instructional sessions. The recorded test sessions will be reviewed by experienced clinicians and rated on multiple performance metrics, including an entrustment score, competence with various aspects of the procedure, time taken to perform the procedure, and a procedural checklist in order to determine adequate acquisition of the procedural skill.

**Results:** Data collection for this study will commence in April 2018.

**Conclusion:** The findings of this study have potential to improve procedural competence and reduce iatrogenic complications in novice learners performing CVC insertion, with potential wider application to other procedural skills in healthcare education.

## **A systematic review of methods of rating content to include in curriculum: mapping the landscape**

Marcel D'Eon

College of Medicine

Co-Author(s): Claire Wright, June Harris, Harold Bull, Greg Malin, Kyle Anderson, Trustin Domes, Kalyani Premkumar, Damon Sakai, Erin Watson

**Purpose:** To review the various methods scholars use to rate potential content for medical education programs and courses.

**Methods:** We conducted a systematic review and defined “content” broadly: objectives, competencies, and topics. Using search terms drawn from articles already identified we identified over 8200 titles. The PI screened all titles and/or abstracts and all of the other authors combined screened them all as well in varying amounts. 183 articles were selected for full text review; of these, 105 met the inclusion criteria as determined by the PI and at least one of the other authors. Conflicts were resolved through discussion and consensus. Fields for data extraction were decided by team consensus. Two authors extracted data from each article. We have not yet completed our analysis.

**Preliminary results:** (All the data have not yet been extracted. ) Studies used a wide variety of data collection methods, judges and rating criteria. Many used an on-line survey-based (rather than in-person) Delphi technique; some used only a survey; a few used epidemiological data. The rating criteria (i.e., relevant, core, essential) and scales with anchors varied considerably. Few studies explained their criteria (e.g., relevance to the content). None of the studies used a validated cut-off point to include or exclude content. The majority of studies did not report on the implementation or evaluation of the program with the identified content. Few studies attempted to validate their content rating methods or their components (criteria, judges, or scales).

**Conclusion:** There seems to be no validated or common approach to rating content to be used in medical education curricula. Further research and development is urgently needed in this area.

## **Aligning the clinical learning and practice environments: an essential component of competency-based education**

Heather Ward

College of Medicine

Co-Author(s): Nina Gao, PhD Candidate Department of Sociology, Robert Perry, PhD Candidate College of Education, Sylvia Abonyi, PhD Faculty, Department of Community Health and Epidemiology, Elizabeth Quinlan, PhD Faculty, Department of Sociology, Pamela Downe, PhD Faculty, Department of Anthropology, Krista Baerg, BScRN MD, Department of Pediatrics, Suzanne Sheppard PhD, MPT, Director of Interprofessional Care, SHA

**Purpose:** Medical trainees are identified as lacking the competencies needed as 21st Century physicians. Holmboe and Wong hypothesize that the influence of the clinical learning environment is not addressed by current educational systems, challenging acquisition of competencies necessary to address care gaps. The influence of the local practice environment defines future practice, as described by Asch (obstetrical complications) and Chen (practice costs). Closer integration of the clinical and education systems is proposed, with QI and patient safety as the bridge. In this project we describe research results evaluating perspectives on patient/family engagement and facilitating alignment of the medical education and practice environment with potential to enhance both patient and learner outcomes.

**Methods:** Royal University Hospital Foundation supported research grant was undertaken with interviews of health care professionals, patients/families, and learners for their perspectives on patient/family engagement in the health care team. A thematic analysis of the gaps in care including learner perspectives identified learning needs for all participants.

**Results:** Habermas' communicative action theory distinguishes communicative action, which aims for consensus through discussion and understanding, from strategic action, which is oriented to success often involving power imbalance. Health care professionals defaulted to strategic action to address system needs, time pressure and overcapacity, whereas shared decision making, prioritized by patients and families, focused on communicative action. Study results will facilitate faculty development and resident learning. A multisource feedback tool will be developed.

**Conclusion:** Evaluating and integrating practice improvement and educational initiatives facilitates achievement of collaborative competence, enhancing patient outcomes.

## **An exploration of learning environment and learning culture in Residency Programs with a Surgical Component at the University of Saskatchewan**

Dr. Anurag Saxena

College of Medicine

Co-Author(s): Desanghere, L., PhD, College of Medicine, University of Saskatchewan. Robertson-Frey, T., MA, College of Medicine, University of Saskatchewan. Lawrence, K., MD, College of Medicine, University of Saskatchewan. Hayes, P., MD. College of Medicine, University of Saskatchewan. Thiel, J., MD. College of Medicine, University of Saskatchewan. Mendes, I., MD. College of Medicine, University of Saskatchewan.

**Purpose:** The aim of this project is to assess and subsequently make enhancements to the learning-oriented culture in the surgical learning environments within the University of Saskatchewan (UofS) residency training programs. This need for improvement has been identified through resident surveys and external accreditation reports.

**Methods:** Of the 249 resident responses, 66 identified their residency program as falling within one of the surgical disciplines at the UofS. All participants filled out an on-line survey assessing their learning environment (LE), learning culture (LC) and program strengths and challenges. Descriptives, between group comparisons, correlations and content analysis were carried out to examine responses. **Results:** Positive aspects of their LC included affiliation (e.g., interactions), accomplishments (e.g., performance standards), and overall low levels of dissatisfaction; residents were less than satisfied with recognition within their program. Positive aspects within the LE included, e.g., independence, responsibility, team spirit, accessibility of preceptors, organization attuned to learner needs, and adequate resources; concerns such as teaching style, appraisal and feedback, relations and atmosphere were mentioned. Open-ended responses revealed various program strengths such as resources (e.g., quality of teaching, learning opportunities) and aspects concerning structure and organization of the program (e.g., environment, scheduling and organization). Challenges were also identified within the environment (e.g., intimidation and harassment) and with service demands affecting learning. Experiencing and witnessing intimidation/harassment/abuse over the last six months and resident burnout had significant negative effects on how residents viewed both their LC and LE. **Conclusions:** Identifying strengths and challenges within programs can help bolster physician training by enhancing different aspects of the environment and culture. These results will be used to inform program improvement efforts within surgical settings at the University of Saskatchewan.

## **Between Objectives and Transformation: A range of perspectives among community agencies and medical students on an experiential pre-clerkship community learning module**

Juan-Nicolas Pena-Sanchez

College of Medicine

Authors: Ulrich Teucher<sup>1</sup>, Erin Wolfson<sup>2</sup>, Yuchen Gao<sup>3</sup>, Jann Ticknor<sup>4</sup>, Krista Baerg<sup>5</sup>, Juan-Nicolas Pena-Sanchez<sup>6</sup>

1. Associate Professor, Department of Psychology, College of Arts and Sciences, UofS
2. Community Engagement Specialist, Division of Social Accountability, College of Medicine, UofS
3. Ph.D. Candidate, Department of Sociology, College of Arts and Science, UofS
4. Saskatchewan Indigenous Council Coordinator on HIV and AIDS, All Nations Hope Network
5. Associate Professor Paediatrics, College of Medicine, UofS
6. Department of Community Health and Epidemiology, College of Medicine, UofS

**Purpose:** The Community and Work Centred Learning Experience (CWCLE) module provides experiential learning for second-year undergraduate medical students at the University of Saskatchewan, assigning self-selected students to a 7 hours of service in one of a range of community agencies and completing a community walk (“community plunge”) to familiarize students with urban core agencies. These activities aim to expand students’ understanding of social determinants of health (SDOH) and work of community agencies addressing SDOH. Focus groups were held to solicit community partners’ and students’ feedback and recommendations about the module.

**Methods:** Three Focus groups were held with ten community partners in Saskatoon and Regina, and two focus groups were held with (four) 2nd and (three) 3rd-year undergraduate medical students. Transcripts from the interviews were analyzed for pertinent themes within and across the focus groups, making use of thematic analysis (Braun & Clarke 2006).

**Results:** Preliminary results from the focus group interviews revealed a range of learning expectations, among Saskatchewan community agencies, and between these agencies and medical students. Some agency members wholly appreciated the students’ contributions (e.g., medical information) and their commitment; others found the short time frame insufficient for students to meaningfully connect with clients (and agency members) to become “transformed” by their experiences. Students generally appreciated the exposure to community agencies but regretted the lack of time to achieve all set objectives.

**Conclusions:** Participants differed widely in their evaluations and solutions, ranging from some agency members’ critique of a health care system and its medical students requiring humanistic approaches; to proposing social barbeque days for students and agencies to meet in a more informal manner; to building more long-term relationships between students and agencies. However, all participants valued the importance of experiential learning to appreciate SDOH in the community, suggesting a better balance between module objectives and transformation.

## **Building Capacity in Social Accountability and Community Engagement**

Erin Walling

College of Medicine

Co-Author(s) Dr. Eddie Rooke, Acting Director, Division of Social Accountability, College of Medicine

**Purpose:** The session will begin with a brief overview of social accountability at the College of Medicine and current faculty development activities related to social accountability. This will be followed by a focused discussion to gather feedback on various ways the Division of Social Accountability can support faculty development in the areas of social accountability and community engagement. The discussion will work through the following questions:

- Can we work within existing forums to determine the learning needs of faculty in the area of social accountability?
- How can we involve faculty in building new learning resources on social accountability?
- What are the preferred platforms for providing resources to faculty?
- What topics are of greatest interest/need to faculty?

**Method:** Oral presentation with PowerPoint and handouts, time allotted for discussion/questions

**Conclusion:** Social Accountability and Community Engagement is a key priority of the College of Medicine. Faculty must be supported in building their knowledge of, and opportunities for engagement in, social accountability and community engagement opportunities. The Division of Social Accountability is committed to supporting and building the capacity of faculty in the area of social accountability.

## **Developing a Continuous UGME Curriculum Quality Review Process**

Beverley Karras

College of Medicine

Co-Author(s): Roona Sinha, Medicine, Pediatrics, CoChair CQRSC, faculty Regina Taylor Gjevre, Medicine, Internal Medicine, Chair Curriculum Committee, faculty

**Purpose:** With the development of new knowledge in medicine and expectations for physicians, medical school curricula are perpetually undergoing iterative evolution and enhancement. At the University of Saskatchewan, a major curriculum change was implemented for the 2018 graduating student cohort. Subsequently, it was recognized that a more robust and formal course review process was required for the entire UGME curriculum.

**Methods:** The University of Saskatchewan Curriculum Quality Review Sub-Committee (CQRSC) was established as a subcommittee of the curriculum committee in July 2016. A course review cycle was created to review each UGME course once during a four year cycle. Each review involves the course director filling out a comprehensive template outlining course information including hours, changes made, evaluations, assessments, program level objectives are covered, and which vertical themes are covered in the course. Next, during the course review orientation, the course director provides an overview followed by an assessment summary from the assessment specialist and an evaluation summary from the evaluation specialist. Three course review focus groups then look in detail at content and objectives as well as for consistency with key documents including the Program Level Objectives, Medical Council of Canada Objectives, CanMEDS roles, Learning Charter Goals, Future of Medical Education in Canada Recommendations, Social Accountability, and longitudinal curricular themes. A summary report is then created, reviewed and approved by CQRSC for presentation to the Curriculum Committee.

**Results:** Course directors report that it has been useful to identify ways to improve the course and commend courses for successes. Recent accreditation visit also confirm that the process complies with accreditation needs for program review.

**Discussion and Conclusion:** Continuous curricular review can be done comprehensively and effectively using a peer review process. A key requirement for successful and effective course review was active faculty investment and participation.

## **Envisioning the Development of Resident Wellness Programs at the U of S: Strategy to Action**

Gayathri Manoharan

College of Medicine

**Co-Author(s):** Robertson-Frey, T; Saxena. A.

**Purpose:** The PGME Resident Resource Office provides non-academic support in a safe and confidential environment to residents who may be coping with professional or personal challenges. A holistic approach focusing on the eight wellness domains is crucial to providing comprehensive support and to address resident needs. The purpose of this project is to develop a wellness strategic plan to identify priorities and to develop action plans for designing wellness interventions.

**Methods:** The planning process began by analyzing data from the 6-month resident survey responses on wellness from June 2015. A consultative approach was taken to identify priorities with stakeholders and a comparative analysis undertaken involving Postgraduate Affairs group members.

**Results:** A new vision and mission statement was crafted and a conceptual framework for prevention and focused interventions was conceived. The conceptual framework provides a reference for design and development of wellness programs and initiatives. The five strategic themes, detailed in the Strategic Plan, aligns with the PGME's Strategic goal to improve learner experience by focusing on learner's success and wellness. The Logic Model further elucidates the strategic plan by graphically displaying the key activities, and its pathway to the intended outcomes of enhanced resident wellness. A list of new initiatives includes rebranding of the Resource Office, communication Plan for promotion of wellness activities, wellness funding for resident-led initiatives at the program/site level, Ice Cream Rounds, and Resident Doctors of Canada (RDoC)'s Resiliency Curriculum with modules designed for residents, faculty and staff.

**Conclusion:** As we proceed with the implementation of the Wellness Strategic Plan, ongoing feedback received from the residents and faculty serves as a kaizen tool to further improve the plan.

## Evaluation of Competency Based Education (CBE) Methods Applied to Resident Handovers

Alia Teja

College of Medicine - Post Graduate Medical Education

Co-Author: Dr. Heather Ward - General Internal Medicine Program Director

**Purpose:** The proposed study of CBE methods, self-directed learning through self-assessment and direct observation, has the intended outcome of skills translation to the practice environment. Building on a mixed-methods study of CTU (Clinical Teaching Unit) handovers at the University of Saskatchewan in 2012 where gaps in learning and skills were identified, this study aims to determine if CBE learning can overcome these gaps. Outcome measures include whether resident learning goals are met and whether a change in CTU handover practice occurs.

**Methods:** Following the 2012 study, several didactic Internal Medicine Academic Half Days addressed handover processes. The first stage of this project is an evaluation of CTU handovers, quantifying the application of a structured format, utilization of closed-loop communication, and inclusion of action items and contingency planning. In the second stage, residents on a CTU block will engage in CBE learning methods, including completion of a self-assessment tool and direct observation and feedback from faculty during Week 1. Resident learners will develop their own learning goals, and practice and reflect on their learning during ongoing handovers. Follow-up direct observation and feedback from faculty will occur during Week 3 to determine if learning goals have been met. Changes in CTU handover practice will be evaluated post-CBE interventions.

**Results:** Results will indicate whether a change in handover practice occurs with translation of skills to the practice environment following CBE-based interventions, compared to traditional educational methods of didactic instruction. The outcomes of the study can be applied to additional Entrustable Professional Activities and learning domains to support redesign of residency learning experiences, and advance residents' clinical competence towards the "does" tier of Miller's Pyramid.

**Conclusion:** This study on resident handovers will implement CBE learning methods, to evaluate resident learning and change in clinical practice, thus informing future educational methods and evaluations.

**Lights, camera, scalpel: The impact of an instructional orientation video on the perceptions of clerkship medical students to their clinical rotation and residents to the preparedness of medical students**

Melissa Wood

College of Medicine

Co-Author(s); Ron Nguyen, College of Medicine, Medical Student, Dr. Trustin Domes, College of Medicine, Department of Surgery, Director of Undergraduate Surgical Education, Adjunct Professor of Surgery, Division of Urology, Faculty

**Purpose:** To investigate the expectations of clerkship students (clerks) and surgical residents to the clerk's orientation to the third-year surgery clerkship. Our aims are to first determine what elements of a surgery clerkship orientation are deemed important to clerks and residents. Second, to create an orientation video addressing these elements. Third, to evaluate if clerk expectations are met with the video. Fourth, to determine video implementation changed perceptions of clerk preparedness.

**Methods:** A committee was formed in summer 2017 tasked with creating a surgery clerkship orientation video. Phase 1 involves a needs assessment survey, distributed to orthopedic and general surgery residents and third year clerks that have already completed their surgery rotation, to determine important elements to be included in the orientation, and determine a baseline perception of clerk preparedness. Informed by the needs assessment, the final version of the video will be created and shown to medical students at the very beginning of their surgery rotation. Phase 2 will involve surveys and focus groups of clerks, surgery residents, and faculty to assess the impact of the orientation video on their perception of clerk preparedness. Survey (quantitative) data will be analyzed with the use of student's t-test and chi-squared testing. Focus group (qualitative) data will be analyzed via thematic analysis using software (Nvivo).

**Results:** Data collection has recently started and is ongoing. We are in the process of collecting our needs assessment data (preliminary results currently unavailable but may be ready to present in June 2018). We anticipate an improvement in preparedness of clerks after implementation of the surgery clerkship orientation video as perceived by clerks, residents and faculty.

**Conclusion:** Improving the orientation of surgery clerks to their rotation is hypothesized to improve the learning environment and the ability of the clerks to perform in the clinical environment.

## **LiveBook: A Natural Language Approach to Clinical Reasoning in Case-Based Learning**

Amit Persad

College of Medicine

Co-Author(s): Sarah Forgie, Department of Pediatrics, University of Alberta, Faculty, Eleni Stroulia, Department of Computing Science, University of Alberta, Faculty, Julia Radic, Department of Surgery, University of Saskatchewan, Faculty

**Purpose:** Case-based teaching in medical education has gained popularity. While this format is useful, it also limits potential for case exploration, and students are limited to selecting options from lists. We created a virtual patient software that allows students to navigate a clinical case that simulates real life clinical reasoning.

**Methods:** We created a program prototype using JavaScript for simulation of virtual patients. Case progression and responses are prompted by free text entered by the user. Instead of a linear format, cases branch based on clinical decision-making. A pediatric case of hemolytic uremic syndrome was loaded. Five clinical experts and twelve medical students were asked to work their way through the case. Their progression through the case was analyzed. Following the case they were asked to complete an eViP questionnaire to rate their experience during the case.

**Results:** All five experts and all twelve medical students agreed that our program was an improvement over previous virtual patient software they had used. Our program correctly responded to 96% of user queries. Responses to the eViP questionnaire favored our system over a pre-existing one, particularly for clinical –reasoning related metrics.

**Conclusions:** LiveBook is able to simulate patient interactions and assessment and is dependent on the clinical reasoning skills of the user. At present, the software is viable for exploration of branching clinical cases. We are working to apply this to neurosurgery as a next step.

## **Our Strategy For Implementing Surgical Foundations Competence By Design (CBD)**

Brian Ulmer

College of Medicine

Co-Author(s): Betty Ann Rohr PhD, Education and Metrics Coordinator, PGME Office, Kylie Kvinlaug MD, Assistant Professor Vascular Surgery, Program Director Surgical Foundations

**Purpose:** The role-out for the Royal College Surgical Foundations CBD program begins on July 1st 2018. In August, 2017 the Surgical Foundations Program Director and the Department Head of Surgery determined there was a need for a Faculty Education Lead to implement the CBD program. Dr Ulmer was selected. In conjunction with the Post-graduate Medical Education office we decided that a four phase approach was the most effective way to educate the faculty. This education process began in November, 2017 and will end in June, 2018.

**Methods:** Phase one- a CBD overview was presented to the Executive Committee of the Department of Surgery and at all Division of Surgery monthly meetings. Phase two- to maximize faculty involvement, all members of the Department received selected CBD presentations and questionnaires that could be used to obtain Royal College Maintenance of Certification points. Phase three- provide live opportunities for using the Royal College Mainport ePortfolio system. Phase four- the development of "online" evaluation surveys to assess the effectiveness of our CBD strategy.

**Results and Conclusions:** This education process is ongoing and complete data will not be available until June, 2018.

## **Providing formative individualized feedback while maintaining exam security**

Susanna Martin

College of Medicine

Co-Author(s): Joshua Lloyd, PhD, Assessment Specialist, Regina Taylor-Gjevre, MD, Assistant Dean Curriculum, Jackie Perrot, MD, Course co-chair Foundations

**Background/Purpose:** Exam security is an ever-increasing concern for medical schools, with “ghost banks” of questions existing and growing for all types of examinations. As many forms of individualized feedback including question review can compromise exam banks, feedback is commonly provided only with purely formative assessments. This limits the feedback students are provided and presents a dilemma: How to maintain examination integrity while providing students with individualized formative feedback?

**Methods:** This project sought to pilot a method of providing individualized formative feedback to students while maintaining exam security. Exemplifying best practices, exam items are created from objectives, then upon completion of an exam, are coded for analysis by pooling items by objectives. Individualized feedback sheets are then created and provided to students detailing the degree of achievement of course objectives, thus supplying feedback on areas of relative strength and weakness.

**Results:** Initial student reactions to individualized feedback on summative evaluations have been positive. Students supported receiving feedback, which was viewed as more useful in guiding implementation of individualized change. By providing feedback regarding their performance on specific course objectives, students obtain individualized formative learning opportunities. There were suggestions for further modifications, which were incorporated into subsequent iterations

**Conclusion:** While maintaining exam security, this method of feedback shifts the focus from the specifics of the question towards concepts missed. Additionally, this process shifts students’ focus from the “mark” to the learning. Implementing student feedback further evaluation will address student observations regarding guessing in exams leading to possible inaccurate categorization. This led to a further modification to address student confidence level, ensuring no academic consequences.

## **Evaluation of learning and transformational change for medical residents following cultural responsiveness training in Indigenous wellness**

Stacey Lovo Grona

College of Medicine

Co-Author(s): Dr. James Barton, Associate Dean CME, College of Medicine, Dr. Anurag Saxena, Associate Dean PGME, College of Medicine

**Purpose:** Medical residents in the College of Medicine, University of Saskatchewan, are required to take an online learning course entitled The Role of Practitioners in Indigenous Wellness. This study will evaluate learning and transformational change in residents who complete the course. The course addresses the impacts of colonialism and intergenerational trauma in healthcare, and takes the learner through the process of developing a safe cultural space.

**Learning objectives include:** 1. To determine stages of learning pre and post cultural responsiveness training. 2. To evaluate learning based on the 4 levels of the Kirkpatrick Model. 3. To examine the experience of self-reflection in cultural responsiveness training.

**Methods:** Data Collection -To evaluate stages of learning, pre and post tests will be designed based on clinical vignettes. Pre and post surveys will also be developed to evaluate satisfaction, learning, behavior and results according to the Kirkpatrick Model. Learners will participate in self-reflection journals and create a practice change goal to describe intent for practice improvement in the area of cultural responsiveness. They will reflect on this goal at 6 and 12 months.

**Data Analysis:** Demographics of medical residents will be explained using descriptive statistics. Quantitative sociodemographic data will be described using frequencies, medians, and interquartile ranges. Means and standard deviations will be used for ages. Wilcoxon's test will be used to compare pre and post responses for all participants across each question. Self-reflection journals and practice goals will be analyzed through iterative thematic analysis.

**Results:** We anticipate residents to progress in stages of learning (Moore and Slotnick) for cultural responsiveness, and to improve in the 4 levels of the Kirkpatrick Model (reaction, learning, behavior and results)(Kirkpatrick Partners).

**Conclusions:** The results of this study will provide new knowledge on the impact of in depth training on the progression of cultural responsiveness in medical residents.

## **Student experiences with on-line modular patient safety and quality improvement curriculum**

Meredith McKague

College of Medicine

Co-Author(s): Tatiana Fras CoM, Student; Krista Trinder CoM, Program Evaluation Specialist; Amanda Oro, CoM, Student; Regina Gjevre, CoM, Internal Medicine, Assistant Dean Curriculum; Meredith McKague, CoM, Academic Family Medicine, Assistant Dean Academic

**Purpose:** Beginning in the 2017/2018 academic year, second and fourth year medical students have been required to complete a selection of Institute for Healthcare Improvement (IHI) patient safety and quality improvement (PS/QI) on-line courses, which are intended to foundational knowledge in PS/QI for clinical practice. Gaining the perspectives of students who have completed the courses will assist with future planning of PS/QI education in the program. We want to understand if an online learning tool is efficient and effective, and to explore students' perspectives on integrating course content with in-program curriculum, and applicability to current or future practice.

**Methods:** This evaluation will use on-line surveys and student focus groups. At the end of Term 1, questions were included on the standard course evaluation for Year 2 asking students which online courses they completed, how useful they found the courses, and any comments they had. Two Focus groups (one with Year 2 students and one with Year 4 students) were held in April 2018, gaining qualitative data and feedback about the courses. This feedback from focus groups will help determine questions to include on the standard course evaluation given at the end of Term 2. The project was waived the requirement for a full ethics review by the Behavioural Research Ethics Board of the U of S.

**Results:** Descriptive statistics of available survey data, themes from comments on surveys, and preliminary themes from focus groups will be presented.

**Conclusion:** Importing on-line curriculum content from established external organizations is an attractive option for medical schools, however determining how to best integrate such content within the curriculum presents a challenge. This evaluation will assist the U of S MD program in considering if, and how, such curriculum can be effectively incorporated.

## **Tailoring policies to Competency Based Medical Education in Family Medicine (Triple C) and Specialty Programs (CBD)**

Aleksandra Pajic

College of Medicine

Co-Author(s): Anurag Saxena, MD, M.Ed., MBA, FRCPC, FCAP, CHE, CCPE      College of Medicine  
Professor and Associate Dean, PGME

**Purpose:** Competency based medical education (CBME), and its latest initiative- Royal College's Competency by Design (CBD), explicitly refer to changes to the assessment approach and interactions between learners and 'observers', the introduction of new language, tools and changes to education administration. In this new hybrid model, where time is a resource, a number of policies require changes in order to be more aligned with the outcome-based approach to design, implementation, assessment and evaluation of residency programs.

**Methods:** Work on policies started in the CBD Policies Working Group, as one of the groups dealing with the implementation of CBME in the University of Saskatchewan residency programs. A number of policy areas requiring revisions were identified: assessment, including topics such as remediation, probation and promotion; transfers; leave of absences from the training and the waiver of training; as well as the resident supervision and pathway to licensure. Identification of key revision areas were followed by the scanning of the current policies, and comparison of current policies to the CBME approach. Once completed, the revised policies were disseminated to all the stakeholders (including program directors, resident association, legal, professional and licensing bodies) for a comprehensive review.

**Results:** Revisions to the policies on assessment and appeal processes are about to be formally adopted by the PGME committee.

**Conclusion:** Amended or newly written policies, as focused statements describing the intent, governing principles and identifying key roles and responsibilities, which are tailored to the local context, would facilitate the transition into the competency based training.

## **The Clinical Ultrasonography Elective in Clerkship (CU/SEC): A Pilot for Senior Clerkship Students at the University of Saskatchewan**

Paul Olszynski

College of Medicine

Co-Author(s): Dr. Zafrina Poonja (PGY4 EM at University of Alberta), Dr. Ali Turnquist, Assistant Professor of Emergency Medicine, University of Saskatchewan

**Purpose:** The objective of the clinical ultrasonography elective was for senior clerkship students to acquire the skills and knowledge to safely integrate into patient care the following clinical ultrasound applications: pneumothorax, interstitial lung syndrome, pleural effusion/hemothorax, free fluid in the abdomen, pericardial effusion, abdominal aortic aneurysm, hydronephrosis, and bladder volume. The elective was deliberately designed to be relevant to a range of trainees including those pursuing residency training in internal medicine, general surgery, pediatrics, emergency medicine, neurology, family medicine and anesthesia.

**Methods:** The trainees spent the first week of the elective scanning several standardized patients (12 hours in total) under the supervision of myself, another EM clinician, and a PGY4 EM resident who is completing a fellowship in POCUS. Each afternoon, the trainees participated in group discussion as well as lead a short presentation on the limits of POCUS in our core set of applications. The trainee's skills and knowledge were evaluated at the end of the first week through a practical exam (scanning 4 patients across 3 scenarios) and MCQ exam. During the second week (clinical rotations in EM, IM, GSx and Neurology) trainees were evaluated by the clinical supervisors with in regards to clinical integration of POCUS into overall patient care. Programmatic evaluation was completed by all participants.

**Results:** The trainee's MCQ marks ranged from 80-95% (pass was set at 80%) and using an entrustment score on the practical exams, each was deemed "able to perform all of the scans with minimal or no prompting or supervision". During the second week (a clinical rotation with the service of their choice/interest) the trainees were deemed to meet and/or exceed expectations as follows: 1) knowledge of the indications for clinical ultrasonography, 2) ability to reliably generate adequate images on a variety of patients, 3) demonstrate the ability to integrate clinical ultrasonography findings into the patients overall clinical assessment, 4) ability to describe the limitations of clinical ultrasound as well as impact on patient work up. The program was evaluated as very valuable with suggestions offered for improving the second (clinical) week of the elective.

**Conclusion:** Trainees acquired and demonstrated sound technique and knowledge during this 2 week elective. Program evaluation signaled a strong satisfaction with the elective with recommendations for improving the 2nd (clinical) week.. Further research should be conducted to evaluate impact on system and patient-related outcomes.

## **The impact of setting the motivational context for learning on medical student well-being and resilience**

Adam Neufeld

College of Medicine

Co-Author(s): Greg Malin, M.D. Ph.D. Assistant Professor, Dpt. of Academic Family Medicine, College of Medicine, University of Saskatchewan

**Purpose:** Academically, medical school is highly demanding. These high demands can negatively impact students' health and well-being, which has been shown to adversely affect patient-centered care and clinical outcomes. Self-determination Theory (SDT) predicts that support of autonomy, competence, and relatedness improves autonomous motivation and, in turn, better learning outcomes, including well-being. However, this has not been explored in the medical education context. Our purpose was to explore the relationship between medical student self-determination (motivation), well-being, and resilience.

**Methods:** We invited all medical students from our local institution to participate and complete validated questionnaires related to SDT (learning climate and basic psychological needs), psychological well-being, and resilience. Basic demographic information was collected for comparison (e.g., year of study, gender, age). Data were analyzed by ANOVA and Pearson correlations.

**Results:** 160 students participated in the survey. Higher student ratings of instructors' autonomy-support correlated with increased psychological needs satisfaction (competence [ $r = .42$ ], autonomy [ $r = .54$ ], relatedness [ $r = .39$ ]), which in turn, correlated with increased psychological well-being [ $r = .84$ ], and resilience [ $r = .60$ ]. A significant effect of year of study on perception of instructors' autonomy-support was found ( $F [3, 150] = 4.253, p < .01$ ), with first years scoring highest, and third years scoring second highest. Differences across gender and age were not statistically significant.

**Conclusion:** These findings confirm the positive relationship between autonomy-supportive learning environments in improving medical student well-being and resilience; particularly during transition years in student training, which represent stressful stages in early medical education. This research may have a broad impact on practice, by creating learning environments in early medical education which foster lasting effects on medical student well-being, and on subsequent patient care.

## **The RaPID Ultrasound Curriculum: Clinical Ultrasound Training for PGY1s in Interdisciplinary Learning Teams.**

Paul Olszynski

College of Medicine

Co-Author(s): Dr. Brent Thoma, Assistant Professor of Emergency Medicine, University of Saskatchewan

**Purpose:** The Resuscitation and Procedural InterDisciplinary (RaPID) Curriculum Pilot will enable our residents to be more comfortable resuscitating acutely ill patients, working and learning in interdisciplinary teams, teaching and utilizing clinical ultrasound, and reducing complications related to central venous catheter insertion. The RaPID Ultrasound Curriculum was designed to introduce trainees to the basics of clinical ultrasonography (physics, knobology, image interpretation, and image generation) as well as core clinical applications relevant to all specialties (detection of free fluid in the abdomen and chest, pericardial effusion, pneumothorax, and pulmonary edema/interstitial lung syndrome).

**Methods:** 38 residents and 9 faculty were involved in the pilot for the 2017/2018 year. Each resident attended five 4-hour ultrasound sessions at which they performed ultrasound on 6 simulated patients per session. Trainees were evaluated on their clinical ultrasound skills and knowledge in each indication throughout the module using an entrustment score. Additionally, trainee skills and knowledge were evaluated at the end of the module through a practical and Visual MCQ exam (powerpoint). Programmatic evaluation was completed by participants.

**Results:** Trainees demonstrated steady improvement in their skills for the length of the module. The trainee's MCQ marks ranged from (pass was set at 80%) and using an entrustment score on the practical exams, trainees demonstrated a spectrum of competence ranging from being able to perform the scans with help from the instructor to performing all of the scans with minimal or no prompting or supervision required. The program was evaluated as very valuable (details forthcoming as we have not completed program evaluation at time of submission).

**Conclusion:** Trainees acquired and demonstrated sound technique and knowledge during this module. Program evaluation signaled a strong satisfaction with the experience. Further research should be conducted to evaluate impact on system and patient-related outcomes.

## **The role of the learning environment on medical student empathy**

Greg Malin

College of Medicine

**Purpose:** Medical student empathy has been shown to decline as students progress through medical school. Self-determination theory (SDT) suggests that support of three basic needs (autonomy, competence, and relatedness) supports student motivation, but hindering them thwarts motivation and can cause students to feel "overwhelmed" to the point of "giving up" or "not caring". The purpose of this research was to determine if a relationship exists between support or frustration of student self-determination and their empathy orientation.

**Methods:** All medical students from a single institution were invited to complete SDT questionnaires (Learning Climate, Perceived Competence, Self-Determination Scale, and Basic Psychological Needs) and the Jefferson Scale of Physician Empathy - Student version. Demographic information was collected for comparison (e.g. gender, year of study, program site). Data were analyzed by ANOVA, correlations, and structural equation modelling.

**Results:** 177 Students from across all four years of the program participated. No differences were seen when comparing empathy scores between gender, program site, or year in program. Empathy scores had a weak correlations with basic psychological needs; particularly, autonomy ( $r=.243$ ,  $p<.01$ ) and relatedness ( $r=.225$ ,  $p<.01$ ) and less so with competence ( $r=.171$ ,  $p<.05$ ). No correlations were seen between empathy and need frustration.

**Conclusion:** Although supporting students' SDT has benefits for various learning outcomes, the weak association with students' empathy orientations suggests that more overt efforts to develop or perhaps even maintain student empathy should be considered beyond support for motivation.

## **TIPS for Residents Manual Revision**

Sean Polreis

Medicine

Co-Author(s): Daniel Mittelholtz - Course Facilitator, Educational Program Designer, Continuing Medical Education, College of Medicine

**Purpose:** TIPS for Residents is the College of Medicine's 2-day course for improving residents' teaching skills. The TIPS manual includes preparatory readings & exercises as well as resources for future reference. While the manual has undergone minor revisions in previous years, it was determined that a more significant change was due. The aim is to make the manual more engaging, user friendly, & accessible. At the same time, content needed updating to reflect current clinical practices as well as both undergraduate & postgraduate medical education.

**Method:** Faculty Development consulted with previous authors of the manual as well as other stakeholders in order to update the content & language. Then, Dan Mittelholtz, with Continuing Medical Education, was consulted to move the manual from PDF to an online version & add interactive components, following applied Multimedia Learning theory and principles. The current plan is to "test" this version with a variety of stakeholders – including faculty, incoming residents, & senior residents who have previously taken the course – for feedback.

**Results:** This process began in February 2018 with a goal to have the manual ready for residents by June 1, 2018. Results will be monitored via resident feedback on TIPS evaluation forms & to-be-determined analysis of manual use on the website.

**Conclusion:** This is an ongoing project with ongoing monitoring. We hope the manual will be more engaging, relevant, & useful for residents.

## **Translational success at the 15-year point for the U. of S. College of Medicine Pre-medicine Awards for Aboriginal Students**

Barry Ziola

College of Medicine

Co-Author(s): Valerie Arnault-Pelletier, Aboriginal Coordinator, and Sherrill Bueckert, Admissions Coordinator, College of Medicine

**Purpose:** Since 1993, the U. of S. College of Medicine (CoM) has had a Saskatchewan Human Rights Commission-approved Aboriginal (AB) Admissions Program (AAP). Currently, 10 of 100 annual seats are assigned to the AAP. To foster AB student interest in medicine as a career, in 2003 the CoM implemented its AB Pre-medicine Awards Program. Determining the translational success of the AB award program at the 15-year time point was the purpose of the study.

**Methods:** Through a file review process, determination was made of the current careers of awardees to date. For awardees who have not successfully applied to and been accepted by our CoM, attempts were made to determine what alternative careers awardees have chosen.

**Results:** The translational success of the awards will be presented in detail, but by way of summary, to date 24 (40.7%) of 59 awardees have either graduated from or are currently enrolled in our CoM and, if all completed professional degrees at the U. of S. are considered, the translational success of the awards increases to 42 (71.2%) of 59 awardees.

**Conclusion:** The CoM AB Pre-medicine Awards Program has achieved phenomenal success in supporting AB students achieve their career goals, primarily in medicine, and secondarily in other professions. The minimum biannual meetings awardees have with the Admissions and Aboriginal coordinators are an essential component of the translational success of the awards program, as these meetings are structured to see how the awardee is doing academically, and to facilitate and encourage the awardee's path to successfully applying to and entering our medical school.

## **Using item analysis to deliver targeted feedback to trainees on OSCE performance**

Susanna Martin

College of Medicine

Co-author: Joshua Lloyd, PhD Assessment Specialist

**Purpose:** Best practices suggest that students be provided with formative feedback on their performance on assessments, including OSCEs, yet reluctance to release station checklists remains. Recent implementation of computer analysis of student performance checklists led to a unique opportunity to offer timely and useful feedback without compromising station integrity.

**Methods:** A framework was developed, using the CanMEDS framework as a basis, and further subcategorizing each OSCE checklist item. Each station checklist was subsequently coded; data combined to develop an individual summary report for each trainee, detailing their score in each category, and comparing their performance to the overall class average.

**Results:** Not all categories were present in each OSCE, and those categories with lower item numbers were less reliable. Student feedback on the utility of their individual reports was positive. The process also highlighted areas of more generalized class performance deficits, such as focusing history or physical examinations.

**Discussion:** In addition to valuable individual student feedback, implementation across multiple OSCEs administered throughout training enabled the provision of the overall performance summaries to both current and successive course directors, aiding in evaluation of program delivery and enabling them to feed forwards implications to each subsequent cohort.

**Conclusion:** Coding of OSCE performance checklists provided the opportunity to provide students with individualized performance feedback. Important information regarding strengths and weaknesses of current program delivery were also highlighted, enabling ongoing modifications to individual teaching sessions and overall curriculum.

**Take-home Message:** Useful feedback on individual OSCE performance can be provided to trainees without compromising station information. It can further be used to inform ongoing program evaluation and curricular redesign.

## **Variation, Selection, Retention: A Simple Evolutionary Change Model for Medical Education.**

Michael Epstein

College of Medicine

**Purpose:** Despite continuing and persistent calls for deep, meaningful, transformational change in medical education, the challenges associated with realizing this objective remain substantial. Two issues frequently mentioned in connection with this challenge include the self replicating nature of organizational culture, and the existence of deep silos of specialization, which act collectively to sustain the status quo. Recent research also underscores the limitations of applying conventional top-down sequential models of planned change to the wicked problem of medical curriculum redesign. This paper explores some innovative strategies for creating change in medical education and proposes a simple model based upon the principles of biological evolution.

**Methods:** The research and innovation project utilizes multiple methods, including participant observation, action research, structured interviews, and survey data. It also draws on several information sources including selective reviews of literature on population ecology, recombinant innovation, organizational design, and adaptive leadership.

**Results:** Findings are synthesized to create a change model based upon ecological principles, including self-regulation, evolution, biodiversity, biopsychosocial diversity, emergence and adaptation. The model also draws on Hull's (1982) concept of memetics, defined as the cultural analog of genetics, utilizing the three basic mechanisms of evolution: variation, selection and retention. The resulting model is illustrated with several examples from my own experience as a change agent within medical education and healthcare systems over the past two decades. Change agent competencies associated with this model are identified, and include knowledge integration, design thinking, and value-added knowledge brokering. Change agent roles associated with the model are identified, and include problem solver, entrepreneur, sociotechnical innovator, healer/facilitator and teacher.

**Conclusion:** The presentation concludes with a brief overview of the ECLIPSE initiative which is intended to provide learners with a practical introduction to the principles and practices of the VSR model in a variety of medical education settings.