



ABSTRACTS

# HEALTH PROFESSIONS EDUCATION DAY



**Event Information:**

September 16, 9:00am- 1:00pm  
Michigan Union, Rogel Ballroom

<http://dlhs-umi.ch/hpe-day>

#HPEday

The University of Michigan is unique with seven outstanding health science schools that share the core missions of preparing future clinicians and scholars, while caring for patients within a single health care system. Within each school, faculty members are actively engaged in educational experimentation and innovation, but the ideas are not always visible to like-minded educators in other schools across campus. With the recent formation of the Michigan Center for Interprofessional Education, we can collectively create a community space focused on innovation within health professions education.

HPE Day, which is an evolution of Med Ed Day, is an opportunity to share and disseminate scholarly efforts completed or in progress, and to spark the dialogue required to synergize our work. This event brings together educational scholars, practitioners, researchers and students to share best practices and explore opportunities for collaboration and innovation. Faculty have an opportunity to learn about innovations being developed and implemented at other schools and share their own creative ideas. The day includes sharing of our initial efforts in interprofessional education and collaborative care and discussion of opportunities for the growth of collaboration across the health science schools and the broader campus community.

## SPONSORS

- Division of Professional Education, Department of Learning Health Sciences, Medical School
- Michigan Center for Interprofessional Education
- Center for Research on Learning and Teaching
- Office of Digital Education & Innovation
- Benn Gilmore Lecture in Excellence in Medical Education

## **EVENT SCHEDULE**

**8:00 am:** Registration Opens

**9:00 am -10:30 am:** Poster, Demonstration, and Display Session

**10:30 am -12:00 pm:** Gilmore Keynote Lecture by Catherine D. DeAngelis, "Patient Care and Professionalism", and Local Response Panel by Representatives of the 7 Health Science Schools

**12:00 pm -1:00 pm:** Lunch and Networking

**2:00 pm - 4:00 pm:** Grand re-opening and tours of the A. Alfred Taubman Health Sciences Library at 1135 E. Catherine Street

## **LEARNING OBJECTIVES**

1. Understand the innovative educational efforts focused on professional education within the health science schools at the University of Michigan
2. Evaluate the initial interprofessional education efforts in Ann Arbor, including their successes and challenges
3. Discuss opportunities for continued development of interprofessional education at the University of Michigan
4. Identify innovation partners for further advancement of interprofessional education and collaborative care within the University of Michigan Health System
5. Strengthen community bonds among educators within the health science schools across all of University of Michigan



Dr. Catherine D. DeAngelis is Johns Hopkins University Distinguished Service Professor Emerita, Professor Emerita at the Johns Hopkins University Schools of Medicine (Pediatrics) and School of Public Health (Health Policy and Management), and Editor-in-Chief Emerita of JAMA, the Journal of the American Medical Association (2000-2011), serving as the first woman Editor in Chief. She received her M.D. from the University of Pittsburgh's School of Medicine, her M.P.H. from the Harvard Graduate School of Public Health (Health Services Administration), and her pediatric specialty training at the Johns Hopkins Hospital. She also has been awarded seven honorary doctorate degrees and has received numerous awards for humanitarianism and medical excellence, including the Ronald McDonald Award for Medical Excellence (\$100,000 donation made to the Johns Hopkins Child Life Program),

the Catcher in the Rye Award for Humanitarianism by the American Academy of Child and Adolescent Psychiatry, The Armstrong, St. Geme, and Howland Awards (Various Pediatric Societies), and a lifetime achievement award by the American Association of Medical Colleges (AAMC).

From 1990-2000 she was Vice Dean for Academic Affairs and Faculty, Johns Hopkins University School of Medicine, and from 1994-2000 she was editor of Archives of Pediatrics and Adolescent Medicine and also has been a member of numerous journal editorial boards. She has authored or edited 12 books on Pediatrics, Medical Education and Patient Care and Professionalism and has published over 250 peer reviewed articles, chapters, and editorials. Most of her recent publications have focused on professionalism and integrity in medicine, on conflict of interest in medicine, on women in medicine, and on medical education. Her major efforts have centered on human rights especially as they relate to patients, health professionals and the poor.

Dr. DeAngelis is a former council member and current member of the National Academy of Medicine (nee IOM); a Fellow of the American Association for the Advancement of Science; a Fellow of the Royal College of Physicians (UK) and has served as an officer of numerous national academic societies including past chairman of the American Board of Pediatrics and Chair of the Pediatric Accreditation Council for Residency Review Committee of the American Council on Graduate Medical Education.

She currently serves on the Advisory Board of the U.S. Government Accountability Office, is a member of the Board of Physicians for Human Rights and serves on the Board of Trustees of the University of Pittsburgh.

# **ABOUT THE BENN GILMORE LECTURE IN EXCELLENCE IN MEDICAL EDUCATION**

David D. Howell ('79 LS&A, '83 MD) established the Benn Gilmore Lecture in Excellence in Medical Education in honor of Benn Gilmore ('66 LS&A, '70 MD). Dr. Howell wishes to honor Dr. Gilmore, in thanks for the education and guidance that Dr. Gilmore provided him while a medical student at U-M, as well as for so many medical students and other individuals throughout Dr. Gilmore's career.

## **PANELISTS**

- **Frank Ascione, PharmD, MPH, PhD** - Director, Michigan Center for Interprofessional Education and Professor, College of Pharmacy (Moderator)
- **Matt Davis, MD** - Professor, School of Public Health, Medical School, Ford School of Public Policy
- **Melissa Gross, PhD** - Thurnau Professor and Associate Professor of Kinesiology, School of Kinesiology
- **Rajesh Mangrulkar, MD** - Associate Dean for Medical Student Education and Associate Professor, Medical School
- **Bruce Mueller, PharmD** - Associate Dean of Academic Affairs and Professor, College of Pharmacy
- **Carol Anne Murdoch-Kinch DDS, PhD** - Associate Dean of Academic Affairs and Clinical Professor, School of Dentistry
- **Michelle Pardee DNP, FNP-BC** - Clinical Assistant Professor, School of Nursing
- **Mary Ruffolo, PhD, LMSW** - Director of Continuing Education Program and Professor, School of Social Work

## **PLANNING TEAM**

- **Toya Adams** - Administrative Assistant, Michigan Center for Interprofessional Education
- **Frank Ascione, PharmD, MPH, PhD** - Director, Michigan Center for Interprofessional Education and Professor, College of Pharmacy
- **Melissa Bruno** - Special Projects Assistant, Department of Learning Health Sciences, Medical School
- **James DeVaney, MBA, MPP** - Associate Vice Provost for Digital Education and Innovation
- **Andrew Howard** - Administrative Assistant, Department of Learning Health Sciences, Medical School
- **Matthew Kaplan, PhD** - Executive Director, Center for Research on Learning and Teaching
- **Anica Madeo, MPH, MSW** - Program Manager, Michigan Center for Interprofessional Education
- **Kathleen Ludewig Omollo, MPP, MSI** - Strategist, Department of Learning Health Sciences, Medical School
- **Michelle Pardee, DNP, FNP-BC** - Clinical Assistant Professor, School of Nursing
- **Caren Stalburg, MD, MA** - Chief of the Division of Professional Education and Assistant Professor of Learning Health Sciences and Obstetrics and Gynecology, Medical School
- **Gundy Sweet, PharmD** - Director of Curriculum Assessment and Clinical Professor, College of Pharmacy
- **Mary Wright, PhD** - Director of Assessment and Associate Research Scientist, Center for Research on Learning and Teaching

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# **IDENTIFYING CORE COMPETENCIES FOR STUDY COORDINATORS WORKING IN CLINICAL & TRANSLATIONAL RESEARCH (CTR) TEAMS**

Eakin, BL, MS; Graham, DN, BA, CCRP; Harris, J, CCRP; Lantz, MS, DMD, PhD, MSD

## **Background:**

Study coordinators (SCs) play a critical role on research teams, however standardized training based on job duties and tasks is lacking. To shape training at the University of Michigan (U-M) using competency-based approaches, the Michigan Institute for Clinical & Health Research (MICHR) sought to define core competencies for SCs engaged in CTR. U-M coordinators have diverse CTR roles. Purpose: 1) familiarize stakeholders about competencies and competency-based education; 2) build consensus for common competencies rather than adopt existing standards from professional sources.

## **Actions, Methods, or Intervention:**

An advisory group of experienced SCs, research, and compliance specialists from U-M was created to define job responsibilities and tasks of SCs engaged in CTR. Resources were provided (e.g. SoCRA, ADA, NIH Nursing & Patient Care Services, Fundamentals of Clinical Research for the Clinical Research Nurse) to guide creation of U-M specific competencies. Six domains were identified. Subgroups defined competencies in each domain. Drafts were compiled and refined by MICHR staff into competency statements and further refined by the advisory group. U-M competencies were then mapped to existing competencies from SoCRA to assess scope, emphasis, overlap, and identify potential gaps.

## **Results:**

Three of six domains included in both U-M and SoCRA competencies were similar. U-M placed more emphasis on protocol development and data management and included new domains for informed consent, recruitment and U-M system requirements.

## **Lessons and Conclusions:**

U-M developed 18 competency statements in six domains, similar to but not identical with SoCRA competency statements. Differences reflect institutional perspectives and will be used as a basis for designing competency-based educational curricula for SCs.

***Health Professions Education Day – Abstract Template  
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**Promoting Interactive and Inclusive  
Approaches to Teaching  
Chest Radiograph Interpretation Using NearPod**

Sarmiento, C, BA, BS; Mullan, P, PhD.

**Background:** As PGY-1 residents, interns routinely order and make preliminary interpretations on imaging studies; yet, many feel more medical school curriculum on imaging interpretation, particularly that of chest radiographs, is necessary (Saha et al, 2012). Currently in medical education, the majority of instruction on imaging occurs during clinical rotations, and most schools do not require imaging courses. Additionally, when taught by radiologists, nearly all use more traditional tools like lectures and textbooks and only half use online or other interactive resources (Straus et al, 2014). This is in contrast to the very nature of radiology and imaging interpretation, which requires investigation and interpretation, two skills requiring a high-degree of interaction.

**Actions, Methods, or Intervention:** An interactive, web-based method of teaching chest radiograph interpretation was created utilizing Near Pod. Near Pod allows instructors to create or download multimedia presentations containing a multitude of interactive features, including multiple-choice questions, free response questions, and, most useful for chest radiograph interpretation, drawings that students submit to the instructor in real time using their own devices.

**Results:** By presenting a variety of normal and abnormal chest radiographs to students using a Near Pod presentation, each student is able to interact with and attempt to interpret the imaging study. Real-time submission to the instructor allows students to receive immediate feedback regarding their chest radiograph evaluation.

**Lessons Learned:** Such an interactive modality to teach chest radiograph interpretation allows instructors to assess the skill acquisition of individual students and to provide immediate feedback or redirection. By requiring the participation of each student, instructors are also better able to assess the need for clarification or further practice, rather than relying on the answer of a single student's interpretation to gauge group comfort with this skill.

**Future Applications and Next Steps:** Near Pod provides a highly-interactive platform ideal for teaching chest radiograph interpretation. This method can also be used to teach a variety of other skills associated with the interpretation of imaging studies, as it places accountability on individual students to interact with the images as well as on the instructor to provide real-time feedback.

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# Lessons In U.S. Veteran Centered Care: A Interprofessional Massive Open Online Course (MOOC) for Health Professionals

Lypson, M. MD, MHPE  
Goldrath, K. BA  
Ross, P. PhD

## Background:

With over two million veterans returning from recent conflict, it is essential that all those in the health professions learn to work with veteran patients and develop the necessary clinical acumen whether working within the Veteran Affairs Health System or civilian hospital settings.

## Actions, Methods, or Intervention:

The course will provide learners with a comprehensive overview of veteran-centered care, engage learners in developing skills in military cultural competency, empathy, and assessment and triage of several mental health conditions. The course will be delivered over 6 weeks and include lecture videos, content expert commentary, perspectives from veterans, educational readings, documentary footage, various active learning techniques (e.g., photo-elicitation, reflective writing) to help learners recognize their own biases regarding veterans specifically, but for all patients in general and learner assessments for each week.

At the end of the course, learners will be able to:

- Understand the principles of veteran-centered care
- Distinguish the importance of military service and veteran culture in health care
- Detect causes of health disparities for U.S. veterans
- Recognize the value of patient-centered communication skills
- Identify subtle cues involved in the assessment and triage of patients with Post Traumatic Stress Disorder (PTSD) and Traumatic Brain Injury (TBI) and Military Sexual Trauma (MST)

## Example Interventions:

Using a collection of over 30 paired photographs of veterans from various conflicts we developed a Massive Open Online Course (MOOC) for Health Professionals to help learners understand the trajectory of U.S. service members. Each paired photograph included one photo of an individual during his or her time in service juxtaposed to a current photo of the same individual taken by a professional photographer.

The MOOC incorporates materials from a workshop based on the documentary *Where Soldiers Come From*<sup>®</sup> which provides an intimate look at five young men who fight our wars and the families and towns they come from. For more information on this film visit the *Where Soldier's Come From* website at:

<http://www.wheresoldierscomefrom.com/>.

## Results:

This course has previously been delivered in an in-person setting to second-year medical students. Students rated the course positively indicating it stimulated improvement in their ability to reflect on their own attitudes toward veterans, made them more mindful of potential disparities in the health care system, and heightened their awareness about providing patient-centered health care. This course is ideal for a completely on-line format as it incorporates key domains of e-learning, particularly lessons that communicate information and lessons that build on procedural skills.

**Lessons Learned:**

- Relevance of topic for healthcare professionals
- Applying concepts learned to meet the needs of today's veterans
- Enhances the understanding of the Veterans Affairs (VA) Healthcare system
- Explores the various roles of the healthcare team
- Ability to formulate arguments and research questions in the area of social determinants and health equity.

**Future Applications and Next Steps:**

We are working with staff at the University of Michigan's Digital Education & Innovation (DEI) and plan to offer the course as on-demand to better meet the needs of learners and provide a platform for completion prior to an interaction in healthcare with a veteran or experience with any VA healthcare center in the country.

The views expressed in this poster are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the U.S. government

# Aligning Faculty and Resident Quality Improvement with Maintenance of Certification

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## Background:

Since 2012, the Department of Family Medicine at the University of Michigan has sponsored annual systematic quality improvement projects with the following goals:

- Improve the health of patients
- Establish an infrastructure for process improvement
- Educate our learners about quality improvement
- Provide opportunities for faculty and residents to meet maintenance of certification (MOC-IV) requirements

## Actions, Methods, or Intervention:

Four projects have been conducted, focusing on improving rates of:

1. Tdap vaccination
2. Diabetic foot exams
3. LDL screening
4. Chlamydia screening

Projects have structure of 2 linked QI cycles:

Plan: Obtain baseline data, Assess root causes, Consider relevant interventions

Do: Intervention

Check: Collect post-intervention measures

Act/Adjust - Re-Plan: Further planning and intervention

Re-Do: Intervention

Re-Check: Post-adjustment measures

Re-Act/Adjust: Further planning

Outpatient faculty preceptors discuss quality measures during continuity clinic

Residents given personalized quarterly quality reports

**Results:** Tdap vaccination and Diabetic foot exam rates improved, LDL screening did not improve but in overall rate of testing, but rate of test ordering did improve, and chlamydia testing slowly improved during the report time (data subsequent showed continued improvement). See attached poster for details.

## Lessons Learned:

Engaging faculty and residents by linking with MOC-IV credit facilitates QI project process. Aligning effort to also address ACGME requirement further

engages residents in the process. These QI projects are pieces of the educational mission to fulfill Practice Based Learning and Improvement Milestones, specifically to teach residents to improve systems in which the physician provides care (PBLI 3).

Projects involve multiple levels of staff involvement, educating residents about the necessity of integrating clinical support staff in QI efforts

**Future Applications and Next Steps:** Plan to use same model to align MOC-IV, resident ACGME requirement for future QI efforts. Underway currently is an effort to improve performance and documentation of Controlled Substance Agreements, MAPS (Michigan Automated Prescription System) data review, and Urine Drug testing for patients on chronic controlled substances.

## **New Construction vs. Renovation: Two Approaches to Implementing Interprofessional Education Curricula**

Sweet, Gundy, PharmD; Mason, N, PharmD; Madeo, A, MSW, MPH; Mueller, B, PharmD

**Background:** Many universities have adopted campus-wide, day-long interprofessional events to meet new accreditation standards. Few have implemented semester-long courses involving students from multiple health disciplines. This study evaluated the implementation challenges of two semester-long interprofessional education (IPE) courses.

**Actions, Methods, or Intervention:** The first effort renovated an existing Service Learning course to encourage participation of students from other health disciplines. The second, Team-Based Clinical Decision Making, built a new course using a team of 11 faculty from dentistry, medicine, nursing, pharmacy, and social work. The benefits and challenges of developing each of the courses were compared.

**Results:** The pharmacy-based Service Learning course, required for all first-year pharmacy students, is an IPE elective for other health science students. The course enrolls 40 pharmacy students and 25 students from other disciplines, mostly kinesiology and public health. Team-Based Clinical Decision Making, which enrolls over 250 students from five schools, is a required course for some students (pharmacy, dentistry, subset of social work) and an elective for others (medicine, nursing). Both courses faced significant logistical challenges (e.g., space in curricula, common time in schedules, teaching space for active learning, tuition stream) and course infrastructure challenges (e.g., crediting, grading, absence policies).

**Lessons Learned:** Revising an existing course allowed for a quick launch, but left many logistical challenges unsolved. Constructing a course from the ground up required much more initial effort, but resulted in a more institutionally integrated course.

**Future Applications and Next Steps:** Institutional efforts must continue to work towards removing barriers to IPE implementation. Continued and increased dialogue and collaboration across schools must occur to identify efficient and effective ways to incorporate meaningful IPE experiences into their curricula.

## **Writing warm-ups as empathy exercise: a student-run writing group for medical students**

Paul, T, BS;  
Grossman-Kahn, R, BA;

**Background:** The Human Side is a student-run group at the University of Michigan Medical School that seeks to bring students together through informal writing groups.

**Actions, Methods, or Intervention:** Every two weeks, 6-8 students gather at a participant's home to write for one hour. Each session begins with an optional writing prompt prepared by someone in the group. The prompts range in topic and are not specifically related to health and illness. After a writing warm-up, students choose to share and receive feedback. We share our writing with the group without preface, edits, or commentary from the writer. Others voice their reactions to both the writing and the content. Rather than taking a didactic approach, we provide an environment for communal sharing and learning. Unlike many other writing exercises in medical education, our prompts lie outside the scope of health and medicine.

**Results:** The original goal of The Human Side writing group was to protect time for writing during medical school, yet we found ourselves inadvertently practicing several overlapping values of healthcare: empathy, listening, support, compassion, and vulnerability. Through the process of providing immediate, positive, and oral feedback to freewrites—raw, personal, and rough material—we sharpened our listening skills. We empathize with the narrator's voice in order to provide sensitive feedback. We give, receive, and respond to constructive criticism, which are abilities crucial to team-based healthcare. As we write, listen, and share, we learn how to feel compassion when unedited words bring us into each others' experiences. We learn how to express compassion in how we respond to these shared experiences.

**Lessons Learned:** The medical profession has gained a reputation for stamping out emotion and empathy in its trainees. As students, we practice showing vulnerability and empathy through sharing our writing. As a group, we collaborated to identify best writing practices for group settings and explored how creative writing can help improve listening and skills. Our educational initiative demonstrates how writing can function as an effective tool in healthcare education to help foster empathy and compassion in future healthcare professionals.

### **Future Applications and Next Steps:**

The Human Side writing group aspires to continue to grow and develop. We hope to experiment with different writing styles and exercises and to reflect more on how these experiences are shaping our healthcare values as we progress in our medical training. We also hope to develop interdisciplinary writing groups with graduate students from other healthcare professions to practice collaboration and teamwork through writing.

## Early Identification and Remediation of Medical Students' Communication Skills

Whitman, L, MSE; Poszywak, K, MS; Ross, P., PhD, Lypson, M., MD, MHPE

**Background:** The Office Hours Program (OHP) was developed to identify medical students with low-performance in communication skills early in their pre-clinical education and provide additional training. There is increasing evidence for enhanced provider communication skills as a tool to improve patient outcomes. Often students who struggle with communication skills are not identified early enough in their training to ensure they are successful on subsequent school and national assessments.

**Actions, Methods, or Intervention:** First year medical students participate in a medical interview focusing on communication skills with a standardized patient instructor (SPI). The OHP was designed to identify and remediate previously unaddressed students with passing scores falling in the marginal 70 to 80% range. Based on this criterion, 59 students with a mean communication skills score of 73% on the first year medical interview were invited to participate in the OHP. Students were informed of an expected one hour time commitment for preparation to be completed online and one hour onsite interview and feedback time. Twenty-two students volunteered and completed the OHP which consisted of 1) Video review of a fellow classmate's first year medical interview with a SPI, 2) Video review of the student's own first year medical interview with a SPI, 3) Self-assessment written activity requiring the student to reflect on their performance and formulate an action plan for the next encounter, 4) Three articles to review as preparation material, 5) Interview and feedback with a second SPI using a new case.

**Results:** Using the same scoring criteria as the first year medical interview, the 22 students who participated in the OHP increased their mean communication skills score from 73% to 86%. Also, none of these students failed communication skills on the second year comprehensive pre-clinical OSCE which assesses communication skills across multiple stations. Seven of the 37 students who declined the OHP invitation and 12 non-invited students failed the communication skills portion of the same exam.

**Lessons Learned:** The OHP provides students with a flexible, yet rigorous, method for improving their communication skills prior to high-stakes examinations.

**Future Applications and Next Steps:** We have implemented a similar program later in training during third year standardized patient exercises to further address communication skills throughout the curriculum.

## Evolution of Clinical Simulation in Medical Student and Resident Teaching within the University of Michigan Department of Family Medicine

Kelley, S, MD; Cooke, J, MD

**Background:** The University of Michigan Health System (UMHS) clinical simulation center (CSC) opened in 2004, and has been a site for education of tens of thousands of providers and staff (e.g., logged 3,074 instructional hours in FY15, with 10,164 discrete learner visits in that period). We seek to describe one Department's evolution, to a point where we now employ clinical simulation in all levels of medical school and residency training.

**Methods:** Ten years ago, faculty within the University of Michigan (UM) Department of Family Medicine (FM) developed resuscitation cases, for teaching advanced cardiac life support (ACLS) and endotracheal intubation to FM residents. Educational efforts in the simulation center were supported by departmental and residency leadership, facilitating development of several procedural curricula. Clinical simulation was built into several rotations, such that each resident rotated through 2-3 times during their training. Meanwhile, we began to expose preclinical students in the Family Medicine Interest Group (FMIG) to clinical life through the CSC. In 2012, the University of Michigan Medical School (UMMS) introduced electives for the M2 students, at which point, we initiated an Elective in Clinical Simulation in Family Medicine. In 2013, we added to this by making a concerted effort to include M3 students on their Family Medicine rotation in the monthly resident simulation sessions described above. Most recently, in 2015, we introduced an M4 elective in Advanced Clinical Family Medicine, which included extensive time in the CSC with intensive precepting (2:1 student to faculty ratio) of procedures felt to be most high-yield to emerging interns.

**Results:** Most of our results are anecdotal, in that learners keep coming back and asking for more time and exposure to the CSC. We did obtain more formal feedback from the M2 students. In the inaugural Elective in Clinical Simulation in 2012, students were asked to “Rate the degree to which you believe you acquired knowledge and skills in this session”—where 1 was the least positive response and 6 the most positive—students’ mean rating for the course was 5.21. In the 2013 M2 Elective in Clinical Simulation, we employed a more robust evaluation system, with pre- and post-tests of knowledge. 11 of 12 students completed the pre-test and follow-up testing, and they showed significant improvement immediately after the course ( $p=0.007$ ), which was maintained at a 6-month follow-up test ( $p=0.012$ ).

**Conclusions:** Our delivery of education in the CSC is limited only by faculty time and CSC space availability. Even in Family Medicine, which many think of as a specialty light on procedures and based in the clinic, we have built a robust educational system for learners at all levels of medical education. We hope to continue to include more learners, espouse the benefits of clinical simulation, and develop more curricula, including obstetrical and palliative care cases.



## ***Capturing Communication Skills: Creating an Online Self-Guided Module for Teaching Communication Skills to Standardized Patients***

Bernat, C, MA, MSW; Buckler, S. RN, MTS; Whitman, L. MSE

**Background:** The process of training standardized patients (SPs) in communication skills being used at our institution lent itself to a lack of standardization and redundancy in training across SP cases. We developed an online communication skills training module and we hypothesize that it will improve the standardization of our communication skills training and increase the accuracy of SP scoring, increase the portability of our training and allow for tailoring the module to accommodate different audiences (e.g. interprofessional learners, residents, faculty).

**Actions, Methods, or Intervention:** We utilized the tenets of both adult and online learning theories to develop our module. Successful online learning comes from clearly defined objectives, stimulating content and creating a connection between the content being taught and the learners' existing knowledge. Additionally, adult learning theory tells us that adult learners tend to be self-directed, practical and bring a variety of experiences to their learning

**Results:** All SPs who completed the online module were surveyed for their feedback. We found that 66% of SPs (N=86) felt that an online module is an effective method for learning communication skills, 87% (N=85) found the module easy or very easy to use and 89% (N=85) felt prepared to score the communication skills checklist after completing the module.

We measured SPs' accuracy with scoring communication skills at three points: 2011 Veterans (Pre-Module implementation), 2012 Veterans (Post-Module) and 2012 New SPs (Post-Module). Accuracy scores were calculated by:  $(\# \text{ correct} / \text{total } \# \text{ items}) * 100$ . Using paired sample t-tests, we found no significant difference in accuracy between either the veteran SPs in 2011 vs. 2012 ( $t(23)=-0.373, p=0.36$ ) or between the veteran SPs in 2011 vs. the new SPs in 2012 ( $t(23)=-1.486, p=0.075$ ).

**Lessons Learned:** While the results do not currently indicate a significant improvement in accuracy, we did find that SPs scored as accurately after implementing the module as they did before. This result, combined with SPs' positive feedback about the module and the cost and time savings realized by our program indicates a positive intermediate outcome and areas for ongoing growth and development for standardized patient training.

**Future Applications and Next Steps:** Since the pilot in 2012, the communication skills module was updated to incorporate several user-friendly changes and it has been administered a total of four times. In the 2015 administration, SPs achieved an accuracy of 87.75% when tested.

Future plans include module adaptation for faculty development and student learning and remediation.

# Towards A Model of Lay Understandings of Health

R. Brent Stansfield, PhD.; Stephanie Preston, PhD.

**Background:** Disagreements about the healthiness of flu shots and vaccines, alcohol and marijuana, marathons and weight-lifting suggest differences in how people conceptualize health and represent the best ways to attain it. In order to promote health, it is necessary to understand these sorts of individual differences and their social and behavioral correlates.

**Actions, Methods, or Intervention:** 136 US residents recruited through Amazon M-Turk completed a rating task, rating the healthiness of each of 115 health-related behaviors and agents on an 11-point scale from "Not at all healthy" to "Extremely healthy" and then completed a demographics and health behaviors survey. The factor structure of the healthiness ratings was analyzed using maximum-likelihood exploratory factor analysis and regression-method factor scores were computed for raters. Factor loadings of items were inspected to determine the content of each factor and factor scores were modeled using linear regression with demographics and health behaviors.

**Results:** While there was broad agreement on the healthiness of the items, four distinct factors were found describing coherent constructs of individual differences. "Natural Foods" ("whole grains", "whole beans with a light vinaigrette", etc.) were rated as more healthy by 32% of participants who tended to be older with higher BMI and trying harder to eat healthy. "Exercise" ("1 mile jog", "exercising an hour a day", etc.) was rated as more healthy by 28% of participants who tended to be younger and less likely to smoke. "Partying" ("a night of drinking", "pitchers of margaritas", etc.) was rated as less unhealthy by 24% of participants who tended to be younger, male, and more likely to be heavy drinkers. "Fatty Foods" ("funnel cake", "pigging out", etc.) were rated as less unhealthy by 16% of participants with no demographics or health behavior correlates.

**Lessons Learned:** Healthcare workers should be aware of individual differences in health beliefs since these differences are likely to underlie differences in patients' understanding of and attitude toward clinical care. Healthcare education should not assume a unitary definition of health.

**Future Applications and Next Steps:** Individuals have somewhat different understandings of health and the healthiness of various behaviors. These differences can be described as coherent constructs that underlie our cultural understanding of what health is. While there is broad agreement that, for instance, "pigging out" is unhealthy, some people regard it as less unhealthy. The fact that younger participants had higher "Exercise" scores and older participants had higher "Natural Foods" scores may indicate a shift in age-appropriate ways of how best to attain health, or a shift in understanding of what a healthy life is or of the social and psychological goals of being healthy.

## Interprofessional Education Must Start Early: The Premedical Clinical Shadowing Experience

Ying A, Makki N, Lypson, M, M.D. Morgan, H, M.D.

**Background:** Preparing health professionals to work in teams is a must do for today's educators, and these skills should be emphasized early.<sup>1</sup> Premedical students are expected to have clinical shadowing experiences,<sup>2</sup> and the learning objectives for *physician*-premedical student experiences have been defined by the AAMC.<sup>3</sup> There is a need to examine the role of non-physician observations in meeting these learning objectives for premedical students.

**Actions, Methods, or Intervention:** 81 students completed 164 clinical observations. 90 were with physicians. 74 were with social workers, genetic counselors, pharmacists, nurse practitioners, physician assistants, nutritionists and nurses. At the completion of each observation, students rated the value of the observation as a learning experience, as well as the extent to which it helped fulfill each of the three AAMC learning objectives. All questions utilized 0-100 visual analogue scales (0=strongly disagree, 100=strongly agree). Statistical analysis of responses was performed with 2-sample t-tests for independent means.

**Results:** Students found great value in the observations with physicians (86.62 +/- 16.88) and non-physicians (84.12 +/- 18.05) (P=0.152). For the AAMC learning objectives, there was no significant difference in how students felt that the observations helped them to better understand the roles of the health care team (non-physicians: 83.14+/-21.52, physicians: 81.20 +/-20.81, P=0.280), and to better understand how the patient perspective impacts quality care (non-physicians:77.38+/-27.80, physicians:80.19 +/-22.57, P=0.239). Students felt that the physician observations (84.81 +/-16.12) helped them to better understand their personal aptitude to be future health care providers than the non-physician observations (77.04+/-21.20) (P=0.004).

**Lessons Learned:** There is significant benefit for premedical students to have clinical experiences with a diverse spectrum of health care professionals. Early exposure to non-physician observations helped premedical students with two out of the three AAMC premedical shadowing learning objectives.

**Future Applications and Next Steps:** Future physicians should have both the academic and interpersonal competencies necessary for the health care systems of the future.<sup>4</sup> The clinical shadowing experience is an opportune time to introduce students to these important key concepts.

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<sup>3</sup>Guidelines for Clinical Shadowing Experiences for Pre-medical Students available at: <https://www.aamc.org/download/356316/data/shadowingguidelines2013.pdf>. Accessed March 20, 2015.

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## ***Health Professions Education Day – Abstract Template***

### **Creating a Community of Practice for Emerging Technologies**

Anderson PF, MILS;  
Mani NS, PhD; Chaffee M, MILS.

**Background:** With the creation of a new Informationist position focused on emerging technologies, a significant challenge was identifying appropriate constituents from which to build relationships and collaborative opportunities and to identify the scope of interest surrounding emerging technology topics. This was especially critical since faculty and staff who engage in emerging technologies may be new to the UM campus, and may be unaware of the library's ability to collaborate with regard to their innovative efforts. Additionally, given the large and dynamic campus community in which we are a part, it may be equally difficult for the library to discover individuals or groups with emerging technology interests. Creating a campus community of practice (CoP) around emerging technologies addressed the goals of facilitating discovery and awareness of emerging technologies themselves as well as connecting various campus communities gathered around specific technologies, with the ultimate goal of connecting the library to these various communities and individuals. The core goals of a CoP include connecting people, sharing context, enabling dialogue, stimulating learning, capturing and diffusing existing knowledge, collaborative processes, self organization of the group, and generating new knowledge (Wenger, McDermott, Snyder, 2002).

**Actions, Methods, or Intervention:** Framing the creation of the CoP within a library communication model began with establishing a consensus of core emerging technologies and vocabulary within a group that self-identified as interested in this area. Components of the process began with an email list, blog, and monthly face-to-face meetings. After a few years, the focus of these components shifted from a library-driven approach to a collaboration model, with community members suggesting topics and tools for exploration. To support this process, a web interface was created to facilitate information sharing and collaborative authoring of the community blog, along with the creation of a Google Plus community, and adoption of Google Hangouts. As the group established strong core literacy in emerging technologies, the focus shifted from information consumption to creation, integration with campus activities, and outreach to other campus communities.

**Results:** Activities expanded from monthly meetings to a host of online and face-to-face activities. Outcomes to date include 5 primary information channels, online broadcast technologies to expand audience and attendance for meetings, and an annual outreach event. There have been more than 80 meetings, with over 2000 tools and resources shared with the community. The strong online presence for the group and its members has fostered strong networking and resource sharing within the group, and has facilitated discovery of the group and its members through external channels. This has created opportunities to influence campus events and technology acquisition as well as leadership opportunities at a national level. Examples include invitations to speak and participate in campus conferences which came through channels developed through this group, and activities such as the We Make Health Fest.

**Lessons Learned:** Communities depend on both geographic and temporal ease of access to information for growth and engagement. This necessitates multiple and flexible opportunities for these activities and resources. There are economies of scale strategies that apply in creating and managing multiple information channels.

**Future Applications and Next Steps:** Partnering with the Mobile Users Group, UM Trends and Tech Team, Web Accessibility Working Group, and others in the creation of a shared database of interesting tools, technologies, and resources for educational, research use, and personal productivity across campus will be explored.

## Introducing pre-health students to interdisciplinary team care; an innovative early intervention

Morgan, H, M.D., Fedrigo, A.

Background: Team training should be introduced early in medical training, before students have the opportunity to create negative stereotypes [1,2]. There is limited data on how best to introduce this in medical education, and even less for pre-professional students [3]. The objective of this study was to investigate whether an interdisciplinary, case-based teaching session would influence pre-health students' perceptions of the health care team.

Actions, Graduate students from the schools of pharmacy, social work, public health, nursing and medicine facilitated small group discussions. The topic was a case involving chemotherapy induced nausea and vomiting. The graduate student all describe their approach, and key issues with this patient. 120 pre-health students participated in the session; these students were predominantly pre-med, but also included pre-pharmacy, pre-dentistry and nursing school students. The pre-health students completed the Attitude Towards Health Care Team questionnaire before and after the session. This validated questionnaire asks participants to indicate their level of agreement to statements using a 6-point Likert scale (1=strongly disagree, 6=strongly agree). Chi square analysis was performed to compare responses before and after the intervention.

Results: Pre-health students had significantly improved perceptions of team-based care after participation in these discussions.

Students reported greater agreement with the statements:

- Patients receiving team care are more likely than other patients to be treated as whole persons (pre-test: 4.22, post-test: 4.77,  $p=0.015$ )
- Health professionals working in teams are more responsive than others to the emotional and financial needs of patients (pre-test: 4.06, post-test: 4.55,  $p=0.001$ )
- Hospital patients who receive team care are better prepared for discharge than other patients (pre-test: 4.23, post-test: 4.85,  $p=0.008$ )
- The team approach makes the delivery of care more efficient (pre-test: 4.74, post-test: 5.32,  $p=0.014$ )
- The team approach permits health professionals to meet the needs of family caregivers as well as patients (pre-test: 4.64, post-test: 5.15,  $p=0.027$ )

Students had greater disagreement with the statement:

- Working in teams unnecessarily complicates things most of the time (pre-test: 2.13, post-test: 1.75,  $p=0.004$ )

Lessons Learned Graduate student facilitated case-based discussions enabled pre-health students to better understand the interdisciplinary nature of health care. This innovative introduction illustrates the potential for pre-professional exposure to interprofessional education.

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## Dental Student Barriers to Participation in an Interprofessional Service Learning Course

Mason, N, PharmD; Madeo, A, MPH, MSW; Tye, E, D4; White, L, D4

**Background:** A one-credit required pharmacy service-learning (SL) course was opened as an elective course in Fall 2014 to students from other health professions, including dentistry. SL course objectives included development of communication, cultural sensitivity, and professionalism skills as well as learning core concepts related to public health, insurance/prescription drug coverage, and civic engagement. Service placements focused on the health experiences of individuals with limited access to health care. Early interest was high among dental students; however very few decided to take the course after the first semester. The purpose of this study was to evaluate the barriers to dental student participation in this course.

**Actions, Methods, or Intervention:** Dental student attitudes and barriers were explored through a focus group evaluation of those who initially signed up but did not take the course, and through a survey of all students in the D2 and D3 classes.

**Results:** Five students who initially expressed interest but ultimately did not take the SL course were included in a focus group evaluation conducted by an expert from the University's Center for Research on Learning and Teaching (CRLT). Students reported initial interest in the course due to the opportunity for community service and more real world experience, learning about other professions, gaining contacts for referrals to other professions, boosting their resume, opportunity for active learning, and practicing communication skills. Primary reasons for their decision not to take the course were interference with rotation opportunities and the time commitment. In a separate evaluation, a survey of students in the dentistry graduating classes of 2016 and 2017 showed between 64.0% and 85.4% agreement with statements regarding the importance of interprofessional education and its benefits to patient care. When asked to rank several potential barriers, the most important barrier to course participation was the time commitment required for the SL course (73.2%). Others were lack of interest in course content (9.9%), feedback from students who had taken the course (5.6%), scheduling conflicts (4.2%) and lack of academic credit for the course (4.2%).

**Lessons Learned:** Elective IPE courses should be given course credit and space in a program's curriculum for students to participate. In this study, students in an already-full dental curriculum felt they did not have the time for this additional course over and above their program requirements. They also did not want to sacrifice experiential learning experiences in their own program in order to take this course, even though this substitution was allowed.

**Future Applications and Next Steps:** Ideally, IPE courses should be required components of a program's curriculum. Alternatively there should be time designated for IPE electives, because it is unrealistic to expect students to add additional work to a full curriculum.



Title: Interprofessional Continuing Education Training in Integrated Behavioral Health and Primary Care: Using Digital Instructional Technologies

Ruffolo, Mary C., Ph.D., LMSW  
Lapidos, Adrienne, Ph.D.

Background: This poster presents a web-based certificate model for interprofessional continuing education training in integrated behavioral health and primary care. The poster addresses: a) the use of an interprofessional team of experts to serve as an advisory group, b) the market analysis process, c) the incorporation of a range of instructional digital technologies and engaged learning strategies, and d) the evaluation.

Methods of Instruction and Learning: The web-based program is delivered over 4 months. Participants earn continuing education units for their profession (e.g., CEUs, CMEs). We use a range of digital instructional technologies to deliver this program including live web-based small and large group conferencing, self-paced web-based modules, and podcasts

Results: Over 150 professionals from a range of health and behavioral health disciplines have completed the certificate. The participants come from across the U.S. and some international sites. We conducted follow up surveys at 6 months to 1 year post the certificate program. Over 85% of the participants reported that the information learned was relevant to their jobs. They also reported using the collaborative skills in their current work.

Lessons Learned: Using digital instructional tools for interprofessional education is emerging as an effective educational approach for teaching new skills and addressing the ever-changing behavioral health and physical health work environment. Using a range of instructional tools, we are able to successfully engage participants in case based discussions and applied learning activities.

Future Applications and Next Steps: We are expanding the web-based interprofessional certificate programs to include specialized topics such as, pediatric integrated health care, advanced clinical skills in dementia care and palliative care practice.

# **Maximizing Student Exposure to Relevant Clinical Rotation Experiences in Intraoperative Neuromonitoring and Enhancing Student Learning Using Clinical Hours as an Assessment Benchmark**

Mergos, J, MS, CNIM; Chulski, K, BS, CNIM, Chulski, N, BA, CNIM

## **BACKGROUND AND OBJECTIVES**

The Intraoperative Neuromonitoring (IONM) concentration within the Movement Science Degree at the School of Kinesiology began in fall of 2012 and has since seen exponential growth and several adaptations to optimize hands-on student learning. Clinical experience applying a variety of neurophysiological tests performed intraoperatively is fundamental to the students' educational experience. This experience is gained over the course of a one year (three semester) clinical rotation at the University of Michigan Health System. Maximizing exposure to clinical experiences and properly tracking student performance and experience has been a challenging task during the program's development.

## **ACTIONS AND INTERVENTION**

Year one students (Class of 2014, N = 3) came in on a tentative basis with the goal of participating in 100 surgical cases. Lead IONM Clinical Preceptor roles were established to coordinate the schedules of year two students (Class of 2015, N = 16). Various rotation schemes were utilized to balance case load distribution. Additionally, case varieties and neurophysiologic modalities were tracked. Beginning with year three students (Class of 2016, N = 10), clinical hours and preceptor variations were also tracked. All year two and year three students were assigned to a weekly clinical rotation schedule each semester consisting of a T/Th, M/W, or M/W/F rotation.

## **RESULTS**

No official record of case, preceptor, or modality variation, nor of clinical hours was kept for first year students. 100 surgical cases were experienced by each student. Year two students were distributed into spring (N = 9) and summer (N = 7) rotation groups due to high enrollment volume. Spring semester students saw an average of 90.1 clinical hours while summer semester students saw an average of 92.0. M/W(F) students saw an average of 15.9 cases whereas T/Th students saw 17.0. Students were placed on staggered 2-3 week rotation schedules during the fall semester, resulting in an average of 85.5 clinical hours and 16.4 cases. This schedule was altered again during the subsequent winter semester, resulting in an average of 90.1 clinical hours and 17.1 cases. Year two students graduated with an average of  $49.7 \pm 3.9$  cases and  $270.1 \pm 26.2$  clinical hours. To date, year three students have seen an average of 25.0 cases and 152 clinical hours.

## **LESSONS**

During the second year, we learned that students should be assigned to cases based on the need to see various types of cases and modalities in conjunction with case availability in an attempt to balance the distribution among the students. Following the spring/summer semester of the second year, it was remarkably apparent that students in the spring rotation had not retained much of their experience over the 8 weeks off before beginning their fall rotation whereas the summer students had no lag time and were thus better prepared at the beginning of the fall semester. This was again noticed during the fall semester following the 2-3 weeks each student had off depending on rotation. Elimination of lag time and equalization of inter-student consistency was prioritized for the winter rotation. First and second priorities were then assigned to each student every other week. This optimized case distribution while providing students with a framework of when to expect clinical experiences. Finally, balance of clinical rotation days was reassessed at the conclusion of the second year after a retrospective calculation of clinical hours and cases seen on each day of the week. This is now recorded prospectively for year three students to ensure a balanced and nondiscriminatory experience for all. It was decided that an appropriate number of students the program could accommodate efficiently was 10-12 students with a goal of students attaining 400 – 450 clinical hours and 70-85 cases before expanding to external clinical rotations.

## **NEXT STEPS**

A subset of year four students will perform clinical rotations off-site as the IONM program continues to grow. The model for clinical rotations developed on-site will allow for uniform procedures to be developed at other sites, while prospectively considering the many variables encountered in appropriately balancing clinical experiences amongst a growing population of IONM students.

## **Child's Last Hours: Multi-disciplinary Training in End-of-Life Care for Professionals Working in Children's Hospitals**

***(Alternative title: A 90 Minute Workshop in End-of-Life Care Increases Confidence in Children's Hospital Staff Who Care for Dying Children)***

D'Anna Saul MD, Ken Pituch MD, Matthew Niedner MD, James Azim MD, Patricia Keefer MD, Adam Marks MD, Rita Ayyangar MD, Terry Murphy, MD, Cecilia Trudeau RN, Maureen Giacomazza RN, Patricia Mullan PhD

**Background:** In children's hospitals in North America physicians, nurses, and respiratory therapists regularly undergo training, certification and recertification in cardiopulmonary resuscitation and advanced life support. There is no analogous required training in the care of children who will die following orders to not attempt resuscitation or for the care of those who die following withdrawal of life support. Yet in most children's hospitals, anticipated deaths far outnumber deaths following failed attempts to resuscitate. Variability in approach to these anticipated deaths in often leads to undue suffering of patients, parents and members of professional care teams.

**Actions, Methods, or Intervention:** In 2010 the Pediatric Palliative Care Team at the University of Michigan's CS Mott Children's Hospital received an internal grant to develop a series of workshops to provide a framework for doctors, nurses and support staff to be able to approach anticipated deaths in a logical, informed, and sensitive manner. Following a 90-minute workshop, participants completed a 16-item retrospective pre-post test to assess confidence in knowledge and skill domains important in caring for dying children. Response options ranged from (1) need further instruction, (2) perform with close supervision, (3) perform with back-up available, or (4) perform independently.

**Results:** Sixty-one (57%) hospital staff and 19 (76%) conference participants completed pre-post self-assessments. 14 of the 16 domains had mean delta score increase  $>0.5$  for hospital staff, 12 of 16 domains for conference participants, who had higher mean pre scores. Prior to the workshop, participants felt most confident in explaining the distinction between curative and comfort care, discussing DNAR orders, and assessing pain (mean Pre scores  $>3.02$ ). The greatest increase in confidence after the workshop was in providing EOL anticipatory guidance, discussing what happens after death, assessing and managing non-pain symptoms, and pronouncing death (delta scores 0.73-0.92). Participants initially felt least confident in discussing EOL decisions in a family conference, with a competent teenager, and in applying ethics to withdrawal of care decisions (mean Pre scores  $<2.52$ ); however confidence increased significantly for each of these skills after the workshop (delta score  $>0.5$ ). These interactive workshops have now been presented to 250 hospital professionals at the CS Mott Children's Hospital. Attendance is now required for all pediatric fellows and residents, and although not yet required for nurses, nursing attendance is high and strongly encouraged. Educational materials including a bedside pocket card (with smart phone accessibility) are all available on an open educational internet site. The program has become a core curriculum offering for fellows at the Pediatric Academic Societies' annual meeting, and over 120 pediatric professionals have attended one of these workshops given at one or more of four national and international meetings. Outcome data from the Mott Children's Hospital finds that participation decreases staff anxiety and distress.

**Lessons Learned:** Over the past several years, this workshop has evolved immensely and been an important component of the house staff palliative care curriculum. Main lessons have involved the continued attempts to keep groups as interprofessional as possible in the setting of challenging scheduling issues.

**Future Applications and Next Steps:** This workshop continues as a biannual to quarterly occurrence based on need. It is currently being evaluated for how well the training assists staff members who are actually involved in end of life scenarios.

## **The Power of Role Modeling During Clinical Training: Midwifery Students in Ghana Learn Patient Maltreatment As Trainees**

Moyer, CA, PhD, MPH; Rominski, SD, PhD, MPH; Nakua, EK, MSC; Dzomeku, VM, RN; Lori, JR, RN, PhD

**Background:** Maltreatment during labor and delivery has been shown to be a significant barrier to increasing rates of facility-based delivery in low- and middle-income countries. Previous research has suggested that maltreatment is often perpetrated by older nurses, midwives, and providers who may not have learned alternative methods to encourage what they perceive to be appropriate behavior by laboring women. This study sought to determine what young midwifery trainees throughout Ghana were witnessing, perceiving, and learning with regard to respectful care during labor and delivery.

**Methods:** 16 public midwifery schools throughout Ghana agreed to participate in this study. Informed consent was obtained from final-year trainees at each school, after which they were asked to complete a self-administered computerized survey. All survey data were entered directly and anonymously into the computer using Sawtooth software with trained facilitators available to answer questions. Data were extracted for analysis using Stata 13.0. Frequencies and descriptive statistics were calculated, and bi-variate analyses were conducted using t-tests and Chi Square analyses. All p-values were set at  $p < 0.05$ .

**Results:** 853 trainees completed the questionnaire: 72.0% said maltreatment was a problem in Ghana and 77.4% said women are treated more respectfully in private facilities than in public facilities. Behaviors that trainees reported witnessing during their clinical training included providers: telling women to stop making noise (78.5%), shouting at women (68.8%), scolding women if they didn't bring birth supplies (54.5%), treating educated / wealthy women better than less educated / poor women (41.5% / 38.9%), detaining women who couldn't pay (37.9%), and speaking disrespectfully to women (34%). Trainees also reported providers being overworked (76.5%), stressed (74.2%), and working without adequate resources (64.1%). Where students performed their clinical training (teaching hospital, district hospital, public health clinic, private facility) had no effect on the perception of maltreatment as a problem in Ghana.

**Lessons Learned and Next Steps:** A majority of midwifery students in training throughout Ghana are witnessing disrespectful care as a part of their midwifery education. While some attribute such treatment to providers working in under-resourced, stressful settings, it is clear that trainees perceive disrespectful care as a problem in facility deliveries. Policy implications include the need to address educational gaps in provider curricula addressing psychosocial elements of care, as well as the need to improve monitoring, accountability, and consequences for maltreatment within facilities.

## **“I was taught it was okay”: A Qualitative Inquiry about Disrespect and Abuse During Midwifery Training in Ghana**

Rominski SD, PhD, MPH; Moyer CA, PhD, MPH; Lori J, PhD, CNM; Baffour PA, PhD; Nakua E, MSc; Dzomeku V, MSN

**Background:** Increasing facility-based delivery rates is one strategy to reduce maternal and neonatal mortality in low- and middle-income countries. Bringing women to facilities where they can be treated for complications should they arise is an international priority. However, assuring women have high quality care during labor and delivery is beginning to be a focus as reports of disrespect and abuse (D&A) are increasingly common. While D&A is not only encountered during childbirth, women are particularly vulnerable at this time. When women experience D&A during childbirth, they are less likely to utilize maternity services in the future.

**Actions, Methods, or Intervention:** The current study sought to elucidate experiences and perception of D&A from young midwives-in-training. Final year midwifery students from Ghana’s 16 public midwifery training colleges were invited to participate in a focus group at their institution. Questions were posed to the group about instances of observed disrespect and abuse, as well as their definition of respectful patient care and the consequences of disrespectful and abusive practices by healthcare providers. Focus groups were conducted in English by the study team, tape recorded and transcribed verbatim. Transcripts were reviewed by the study team and themes emerged.

**Results:** Midwives-in-training reported high levels of disrespect and abuse during the deliveries they had participated in as part of their training. These young women eloquently discussed the consequences of D&A and spoke of what respectful patient care meant to them. Generally, it meant treating every patient with respect, regardless of her background or ability to pay. While these young midwives agreed that respectful delivery care is important, they were also able to justify abusive and disrespectful practices they had witnessed or participated in themselves. For example, one woman said, “So if you go and you are extra nice to (the patients), then (the nurses) tell you to be hard on them. . .If you’re extra nice to (the patients) they will not listen to you, so most of the time (the nurses) expect you to be extra hard on (the patients) also.”

**Lessons Learned and Next Steps:** While midwives-in-training understand the reasons why respectful care is important, they feel there are instances where abusive behavior is necessary to ensure a successful delivery. Midwifery students learn this from their preceptors. Midwives-in-training could benefit from increased training on ways to communicate with and motivate women during stressful deliveries. Clinical preceptors and midwifery faculty need support to teach and model respectful patient care as the D&A reported by midwifery students occurred during clinical rotations as part of their education. Finally, accountability measures need to be implemented to ensure that D&A during childbirth is not condoned, either tacitly or explicitly.

## International Immersion for Undergraduate Students in the Health Professions

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### Abstract

#### Background

It is important to prepare students in health professions to address emerging global health challenges and to raise their awareness of their role as global citizens. As a WHO/[Pan-American Health Organization](#) (PAHO) Collaborating Center for Research and Clinical Training in Health Promotion Nursing, the University of Michigan School of Nursing has a global reach, and considers language proficiency and cultural competency foundational for regional collaboration. Travel immersion programs allow students to develop language proficiency and experience firsthand the culture, language and healthcare of another country. This poster will describe a program we have developed over the last three years to provide an opportunity for cultural and language immersion in Mexico, as well as an introduction to global health concepts.

#### Actions

Initially funded by an Undergraduate International Studies and Foreign Language Grant from the Department of Education, Spanish Language for Health Care Professionals began in May-June 2013, sending 8 undergraduates, including nursing students and pre-health students from LSA, to the Instituto Cultural Oaxaca in Oaxaca, Mexico for 6 weeks of intensive language study (5 days/week, 7 hours/day) complemented by home stays and community volunteering. Thirteen students, including 2 from Kinesiology, attended in May-June 2014, and 11 from Nursing and LSA went in 2015. In 2013 students received no course credit; in 2014 transfer credit from the Spanish Department was granted and approved for their major and minor requirements, and in 2015 the program was approved as a new 6-credit spring term course, HS 300, with the addition of a weekly seminar on global health, taught by UMSN faculty.

#### Lessons learned

Despite the inevitable cultural, behavioral and health challenges common to undergraduate immersion programs, this experience has been very positively received by students and faculty, and we have benefitted from collaboration with the U-M Spanish language faculty and the host institution in. However, we have yet to determine the most sustainable program model to maximize participation. Ideally we would like to send up to 16 students per year, and we would like to encourage more nursing students to apply. In the first 2 years, we offered the program as a co-curricular option and did not charge U-M tuition. Although that kept the overall costs down, which was initially a draw, we found that, for a number of students, lack of academic credit was a significant drawback. We are also striving to find the right staffing model, given the workload issues for nursing faculty, who find it difficult to get enough leave from teaching and clinical practice to be gone for 6 weeks.

## **Future Applications and Next Steps**

Flexibility, interdisciplinary collaboration, commitment and the ability to evolve are important in developing a viable global language immersion experience for students in the health professions. Next steps include addressing challenges noted above as well as expanding opportunities to collaborate in meaningful ways with Oaxacan healthcare institutions. Moving forward, we are making yet another change to the program model. In 2016, HS 300 will begin with 2 weeks of seminar taught on the U-M campus. Prof. Gallagher will spend this time introducing core concepts of global health and Mexican health care. The group will then spend 4 weeks in Mexico rather than 6. The change will be easier on the faculty work schedules and allow faculty to build a relationship with the group before they travel and better prepare students for the experience. Spending less time in country should also help us keep the program fee at or below what it was last year. The change will require cutting back on time spent in the language classroom, but the 2-week volunteer placement will remain. Our expectation is that, with greater emphasis on the health system experience we will increase our enrollment and attract greater numbers of nursing students. Another factor that should affect our enrollment going forward is the introduction this fall of a new undergraduate Nursing minor, "Population Health in a Global Context."

To that end, we are also working on a 2 ½ week clinical immersion option in Oaxaca for our graduate NP and Midwifery students, to be supervised by Ms. McCormick. Both groups will be on site at the same time, which we hope will allow some shared experiences and help strengthen our connections in the local health care community.



# Dental Students Apply Evidence-Based Practice (EBP) to Clinical Scenarios: Developing, Enhancing, and Assessing Skills

Sheridan, RA, DDS, MS; Lim, G, MPH; Oh, TJ, DDS, MS; Chan, HL, DDS, MS

## Background:

Evidence-Based Practice (EBP) is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. In dental education at the University of Michigan, there is potentially a gap between acquiring EBP knowledge and practicing it on clinical scenarios. By the time starting seeing patients actively in the 3<sup>rd</sup> year of dental education, the students mostly forget the knowledge about EBP they acquired in their 1<sup>st</sup> year. The purpose of this study was to determine if a lecture-based module and group exercise improve the 3<sup>rd</sup> year dental students' perceptions of EBP and ability to apply EBP to diagnose and treat gum recession.

## Actions, Methods, or Intervention:

Third year dental students (N=114) were given two interventions that involve the application of EBP skills to a clinical scenario about diagnosis and treatment of gum recession: 1) a 50 minute lecture and 2) a team-based creative learning project that involved creating and answering a PICO question.

Students were assessed at three time points: Initially (T1) and after each of the two interventions (T2 and T3.) Students' perceptions were evaluated with a questionnaire; students will rate statements regarding their perceptions of EBP on a 1 (Strongly Disagree) to 5 (Strongly Agree) scale. Students' learning was assessed with a multiple-choice examination.

## Results:

Paired t-tests were used to compare mean questionnaire and examination scores between each time point. Mean questionnaire scores (40 possible points) showed significantly increased perceptions of EBP. (T1: 30.812 v. T3: 33.224,  $p<0.001$ ) Mean examination scores (21 possible points) showed significantly increased performance (T1: 14.459 v. T3: 20.138,  $p<0.001$ ). A larger difference in mean scores occurred between T1 and T2 (14.423 v. 17.973, respectively,  $p<0.001$ ) than between T2 and T3 (18.028 v. 20.156, respectively,  $p<0.001$ ). Students rated statements regarding "Reaction to EBP Experience" and "Attitude about EBP" consistently high between T1 and T3 (with no significant differences.) However, significant differences showed improvement in mean scores between T1 and T3 related to the themes "Self-efficacy for conducting EBP", "Knowledge about EBP", and "Skills for Performing EBP" ( $p<0.001$  each.)

## Lessons and Conclusions:

The two interventions led to significantly increased positive perceptions of EBP and EBP performance. They strongly impact students' self-efficacy for conducting, knowledge of, and skill for performing EBP. Students appear to enter the class with a high perceived value of EBP and, thus, the interventions do not have a significant

impact on student reaction to EBP or attitude about EBP. This suggests that the interventions can be modified to focus less on reaction to and attitude of EBP and more time focused on self-efficacy, knowledge, and skill.

***The project is supported by a ISL grant (2015-2016) from the Center for Research on Learning and Teaching (CRLT)***

Preparing medical students for field experiences in low-resource settings:  
development and evaluation of a pre-travel trigger video and large group discussion module

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**Background:** Health care professional students, including medical students, increasingly seek opportunities for field experience in low-resource international and domestic settings. Participating students have been shown to care for medically underserved populations. However, programs infrequently provide anticipatory guidance that meaningfully engages students in anticipating and preparing for predictable challenges.<sup>1</sup>

**Methods:** Development and evaluation of a 30-minute trigger video and discussion guide for first-year medical students planning field experiences in low-resource settings, in international and domestic settings, to prepare students for complex decision-making and cultural awareness. The trigger tape featured medical students describing unexpected dilemmas they experienced in their field experiences in projects intended to ameliorate health care disparities, both domestically and internationally. Faculty-facilitated discussion, guided by a discussion guide, followed each student-narrated dilemma. The intended learning outcomes focused on students' ability to anticipate and identify strategies for dealing with: death or injury of collaborating community members; respect for patients in the setting; precautions for students' own exposure to infectious agents, risks to physical safety, and harassment; cultural sensitivity and humility; and managing cultural isolation. The curriculum was implemented at two points in time, to promote students' planning and reflection for anticipated field experiences in the succeeding six months. Evaluation included post-session anonymized reviews of the relevance and impact of the educational intervention.

**Results:** Of the 45 M1 students who planned domestic or international disparities-focused field experience, most (over 90%) characterized their behavioral intentions following the video tape trigger and follow-up discussion as "very likely" to: anticipate and deal with potential risks to their personal safety, exposure to infectious diseases, and sexual harassment; plan for potential challenges to cross-cultural communication and cultural isolation; complete prophylactic immunizations prior to travel; and manage differences in respect demonstrated for patients. Almost all (98%) of students characterized the program as helpful for their planning and would recommend the video and discussion to other students planning field experiences in settings with low-resources and medically underserved populations. Students who disagreed characterized the session as "making them uncomfortable about challenges" or indicated the information could have been condensed into an e-mail summarizing key points

**Lessons Learned:** A focused, engaging educational intervention featuring medical students' challenges in working in medically underserved populations can promote students' preparation.

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<sup>1</sup> Crump JA, Sugarman J, and the Working group on ethics guidelines for global health training. Global health training: ethics and best practice guidelines for training experiences in global health. *Am J Trop Med Hyg.* 2010. 83(6): 1178-1182.

Future Applications and Next Steps: Sustaining the intervention will require involving additional faculty for successive cohorts of students. We will explore the interest and involvement of other health care professional students.

## Introduction to Interprofessional Practice through Initial Longitudinal Experience

Haque F, MA; House J, MD; Sullivan A, MS;

**Background:** Research has shown that in today's complex medical system, medical students need to learn critical competencies in teamwork such as communication in teams, awareness of one's own roles and responsibilities, and skills to promote supportive team relationships. Additionally, students can benefit from early exposure to clinical settings. Currently, the medical curriculum at the University of Michigan Medical School (UMMS) allows preclinical medical students the opportunity to gain clinical experience but only informally and usually it is only shadowing a physician. It is not until the third year that students rotate through organized clinical rotations through the various departments such as Emergency Medicine, Surgery, Internal Medicine, etc. To address the need for earlier clinical exposure and team-based healthcare, UMMS has introduced an interprofessional education-based curriculum.

**Actions, Methods, or Intervention:** The Initial Clinical Experience (ICE) is a year-long, longitudinal, clinical experience designed to give first year medical students experience in meaningful clinical care with progressive responsibility. Students achieve this by reading about, actively observing, interacting with, and learning from approximately 20 different professionals in 18 inpatient and outpatient clinical settings in the University Health System, as well as local affiliates. Core learning objectives include developing effective communication skills, becoming aware of the roles and responsibilities of the healthcare team, engaging in self-directed learning, and understanding healthcare systems as a whole. Students are evaluated through individual reflections, online group discussions, integrative final papers, and evaluation of communication and overall professionalism from the preceptors at the clinical sites. Course assessment will consist of two formal evaluations from students and clinical preceptors, data from student reflections, and informal feedback received by course leadership team throughout the year.

**Results:** The course, as designed, has been approved by a majority of the UMMS faculty and has successfully launched. However, because this course is still in its infancy, the data necessary for conclusive results is currently unavailable.

**Lessons Learned:** Pending

**Future Applications and Next Steps:** As the program evolves, we will consider introducing training for preceptors to ensure consistent learning for students; incorporating progressive responsibility for students into the curriculum (e.g., students practice taking patient history or vitals); debriefing with students in small groups; providing additional guest lectures on relevant topics (e.g., social identities; privilege, power, and oppression; cultural humility; etc.); and a large group debriefing with the health professionals and students at the end of the year.

## **A 6-Domain Framework Was Useful in Identifying Clinically Relevant Biopsychosocial Information**

Ward D, MD; Mullan PB, PhD; Williams BC, MD, MPH

**Background:** Traditional 'History and Physical' data gathering format emphasizes biomedical diseases and underemphasizes behavioral, environmental, and social determinants of health. Clinical assessment and planning by physicians frequently omits psychosocial information relevant to mutual goal setting, facilitating patient self-management, and identifying and addressing barriers to care. Physician learners cite as barriers to gathering more complete biopsychosocial information: a) limited time, b) limited skills and responsibility for managing non-biomedical problems, and c) that social determinants of health require interventions other than health care.

We sought to provide physician learners a method for efficiently gathering information from patients during routine clinical care that would: a) enhance identification of clinically relevant behavioral and social factors directly relevant to their assessment and care, and b) facilitate mobilization and collaboration with non-physician health care providers.

**Actions, Methods, or Intervention:** Based on best practices in settings emphasizing comprehensive care planning - geriatrics, mental health, and care of homeless persons one of us (BCW) developed a framework for assessment with 6 domains: 1) Biomedical conditions, 2) Mental Health, 3) Behavioral Health, 4) Social Support, 5) Resources and Living Environment, and 6) Function. The framework was introduced to fourth year medical student Sub-Interns on Internal Medicine Inpatient services, who were required to use the framework to: a) gather information at admission or in daily care of at least one patient, and b) identify one problem to address with other physician and/or non-physician members of the health care team. After 2 months of exploratory refinement, 10 students applied the framework in May and June, 2015. This report focuses on students' open-ended comments and responses to 10 Likert-type questions on the usefulness of the framework in identifying information that could be used to improve patient care.

**Results:** Survey responses are available for the 5 students rotating in May. All students 'Agreed' or 'Strongly Agree' that the 6-domain framework "was helpful in identifying barriers to care and followup", "added value to the history and physical", "improved my understanding of my patient and their needs", and "helped me create a comprehensive problem list to identify at-risk patients". Comments, received from 6 of the 10 students, were uniformly positive, and included "This was a great exercise and really helped my patient.", "Would be great to do on every patient...", "Very helpful...Ensures complete H and P", and "going through these questions improved (my) relationship...with my patient, as she thanked me...afterwards...I was glad (using the framework) had a conversational flow and didn't feel like...a checklist of questions."

**Lessons Learned:** In this pilot study, the 6-domain framework for patient assessment appears useful in facilitating medical students' identification of clinically relevant issues not included in the traditional 'H and P' without feeling burdened by the more comprehensive approach. It also appears useful in facilitating care planning involving other physician and non-physician members of the health care team.

**Future Applications and Next Steps:** We plan to: a) examine the content of students' admission and progress notes for systematic application of the framework and relevance to care

planning, and b) investigate the feasibility of expanding the 6-domain framework to other inpatient and outpatient teaching settings.

# **Orienting First-Year Medical Students to a Team Focused Experience: Design and Results from a Medical School Orientation Session Directed by Health Professionals**

House J, MD; Sullivan A, MS; Sun J

## **Background:**

Beginning in 2015, U-M Medical School (UMMS) initiated implementation of a major curriculum revision. The Initial Clinical Experience (ICE) is a core component of the new curriculum, wherein first-year medical students learn key aspects of health care from early-immersion, longitudinal clinical experiences. Three key foci of the ICE curriculum are Patients, Teams, and Systems. Various health professionals from UMHS were identified to participate in a session focusing on a team focused experience. The ICE curriculum administrators within the Office of Medical Student Education (OMSE) collaborated with these health professionals to provide an orientation to healthcare teams, at the outset of first-year students' training.

## **Actions Methods, or Intervention:**

ICE curriculum administrators developed a team-focused session for a four-hour block of time during the second week of medical school. Key session objectives included an increased understanding of the educational background, training and role in patient care of health professionals. A video of a patient/parent/physician interaction in the Emergency Department was recorded and showed as a discussion point for the meetings with the health professionals. Faculty involved with the ICE curriculum helped identify 18 health care professionals from UMHS that could have been involved in the patient's care from the video. Healthcare professionals also provided questions to prime the students for the session by submitting questions they believed first year medical students did not know, but should know. These questions were then sent to the students who were instructed to complete the quiz two days prior to the session and the results were provided to the facilitators so they could use them as an additional source to stimulate discussion. For the session itself, the health professionals met with small groups of students to show them the indicated video above. Afterwards, they would discuss their education, training, background, role in patient care and open it up to questions from the students. Each student group then would rotate to a different room where a different health professional would again discuss their education, training, background and role in patient care. Students would rotate to each room, meeting once with each health professional for a total of 9, 15 minutes sessions.

## **Results:**

Eighteen healthcare professionals from 9 different professions were involved in the session: Respiratory Therapy, Nursing, Social Work, Pharmacy, Medical Assistant, Physical Therapy, Occupational Therapy, Physician Assistant, and Nutrition. Seventeen questions were generated for the quiz and 140 out of 167 students took the quiz. The average score was 67% with a range of 41% to 88%. The score on individual questions ranged from 6% to 99%. Half of the class was surveyed about their orientation experience with a 67% response rate. Of the students that participated, 86% of respondents agreed or strongly agreed that the session was a valuable component of orientation. An informal survey was provided to the 18 health professionals that participated with a 61% response rate. The majority appreciated the opportunity to participate and found it a worthwhile, rewarding experience. They also mentioned that students were engaged, asked thoughtful questions, and were interested in learning about



their profession. They also provided feedback on ways to improve for next year such as longer sessions with the students and changing the video to better reflect more health professionals.

**Lessons Learned:**

Health professionals play a very big role in patient care. Educating medical students about their varied roles, training and background is valuable information for students to be aware of as they will be working with healthcare teams throughout medical school and into their professional careers. Overall, early medical students demonstrated proficient knowledge of the various health professions, but the quiz allowed for prompts for discussion and talking points for the health professionals. Providing the quiz prior to the session allowed immediate feedback to the students regarding their performance and also got the students thinking about the different professionals involved in patient care. The health professionals who participated proved to be interested in teaching medical students and found the experience valuable, necessary and rewarding.

**Next Steps:**

Recognizing significant value in these initial sessions, OMSE ICE curriculum administrators will review program evaluation data to identify strengths and areas for enhancement, and will provide similar sessions in the future with looking at ways to include other health professions. We will also consider the format of the program and perhaps start the session in a large group setting with a panel of health professionals before breaking off into small groups where students would then meet with them individually.

## **Medical student leadership training in health disparities through collaboration with non-academic organizations: What do community-based organizations value?**

Williams, BC, MD, MPH; Mullan PB, PhD; Williams J, MD; Haig A, MD; Fisseha S, MD, JD

**Background:** Addressing health disparities requires collaboration among different types of organizations such as academic institutions, non-profit social service organizations, and community groups. However, developing meaningful field experiences for medical students is challenging. To plan the future of a partnership program between community-based organizations (CBOs) and medical students, we sought to determine what aspects of short-term collaboration with medical students were most valued by CBOs.

**Methods:** The 34 second-year medical students participating in the co-curricular Global Health and Disparities Path of Excellence at the University of Michigan in 2013-14 partnered in teams of 2-4 students with CBOs that had been recruited during the previous year. Students self-selected into teams for 7 of 9 pre-identified CBOs; 2 additional projects run by students were accepted as CBO-equivalents. CBOs included 5 community clinics, a social service agency for urban girls in poverty, a school-based clinic network, a public school, and pediatricians' offices instituting enhanced mental health services with UM faculty.

Students and CBOs created and implemented a small project over a 7 month period. The only requirements were that the projects: a) include meaningful participation by students in design and execution, b) be of value to the CBO or its constituents, and c) require a maximum of about 4 student-hours per month over seven months. At the completion of the projects CBOs completed 5 Likert-type and 3 free text questions regarding the students' behavior and level of engagement, the value of the program to the CBO ('what worked well?'), and suggestions for change.

**Results:** Seven of the 9 projects were viewed as complete by the students and CBOs. Two were not completed due to communication or expectation gaps between students and their CBO liaisons. One project required substantial unexpected work in obtaining security clearances for the students. Eight of the 9 CBOs 'Agreed' or 'Strongly Agreed' that the medical students were communicative and respectful, and had identified a project helpful to the organization. 7 CBOs reported that the students communicated the results of the project to their constituents, and included a plan for continuation of the project. In addressing 'what worked well', CBOs described students' enthusiasm, efficiency, and interest in the CBO; and having a concrete project (rather than observation). The only suggestion for improvement, voiced by 4 CBOs, was that more time be available for the projects.

**Lessons Learned:** Student-community partnerships can provide crucial opportunities for students' to learn and apply skills in organizational leadership to ameliorate health disparities. CBOs' responded positively to short-term collaboration with preclinical students. In particular, CBOs were uniformly supportive of having students participate in creating new projects rather than merely implementing ongoing projects, a key factor in students' enthusiasm and leadership skills development.

**Future Applications and Next Steps:** Challenges relate primarily to sustainability, and include the substantial time and effort required by the medical school to create and maintain relationships with a large number of CBOs, and (we speculate) enthusiasm of the CBOs in volunteering their time year after year to short-term projects with successive cohorts of students. Strategies for long-term success likely include: a) securing adequate faculty time for CBO liaison

work, b) involving individual CBOs less than yearly, and c) protecting curricular time for students' longitudinal engagement in the community.

## Training Interprofessional Adolescent Champion Teams to Develop Adolescent-Centered Medical Homes

Lane, J, MA; Patterson, V, MPH; Ranalli, L, MPH; Riley, M, MD

**Background:** National surveys of physicians, nurses, social workers and other health professionals identify gaps in self-perceived skills, competencies, and training related to adolescent health.<sup>1,2,3</sup> The UMHS Adolescent Health Initiative (AHI) promotes interprofessional education and teamwork through its comprehensive Adolescent Champion model, an innovative approach to educating health center teams to improve the quality of care for adolescent patients. The Adolescent Champion model is currently being implemented in 30 primary care and school-based health centers across Michigan.

### **Actions, Methods, or Intervention: Adolescent Champion Model Components**

**Champion team:** An interdisciplinary team of healthcare professionals that is able to contribute multiple perspectives to provide comprehensive care for adolescent patients is critically important.<sup>4,5,6</sup> The Adolescent Champion teams are comprised of providers, health center managers, social workers, nurses, or medical assistants, and serve as collaborative agents of change. **Professional Development:** AHI guides Champion teams through a professional development series on organizational change, core competencies for adolescent-centered care, and facilitating Staff Sparks, which are mini-trainings for health center staff intended to “spark” dialogue and drive improvements in health center practice and culture. Sparks are designed for busy primary care health centers and include ready-to-use presentation scripts, activities, and resources. The Adolescent Champion model qualifies for CME, Practice Improvement Continuing Medical Education (PI CME), and Maintenance of Certification (MOC Part IV) credits. CME and MOC Part IV projects are designed to improve care and increase provider and staff participation and buy-in across their practice.

**Assessment Tool:** A comprehensive 12-section self-assessment guides the multidisciplinary champion team to prioritize areas of greatest need in order to optimize the health center’s environment, policies, and procedures related to adolescent health, ranging from access to care to mental health services to culturally appropriate care. Teams select priority areas for improvement, and AHI provides technical assistance, customized resources, recommendations, and trainings. **Risk Screening:** The model is designed to increase the use of standardized, evidence-based risk screening to identify mental health symptoms and high risk behaviors among adolescent patients. AHI provides training and technical assistance on risk screening, confidentiality, and minor consent for providers and health center staff at all participating Adolescent Champion sites.

**Results:** AHI conducted a survey with 279 providers, social workers, nurses, and other health center staff across 13 primary care clinics in Michigan. When asked how often they accurately discuss and apply confidentiality and minor consent laws with adolescent patients, 76% of providers responded “Sometimes” or “Rarely”, and only 24% responded “Usually” or “Always”, demonstrating the need for improved confidential care. Currently, 48 physicians across 12 health centers are participating in AHI’s MOC Part IV quality improvement project on the provision of confidential care for adolescents. Preliminary results from patient chart reviews highlight the model’s impact; for

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<sup>1</sup> Nerdahl P, Berglund D, Bearinger LH, Saewyc E, Ireland M, Evans T. New challenges, new answers: pediatric nurse practitioners and the care of adolescents. *J Pediatr Health Care*. 1999 Jul-Aug; 13(4): 183-90. doi: 10.1016/S0891-5245(99)90038-X

<sup>2</sup> Blum RW, Bearinger LH. Knowledge and attitudes of health professionals toward adolescent health care. *J Adolesc Health Care*. 1990 Jul; 11(4): 289-94. doi: 10.1016/0197-0070(90)90037-3

<sup>3</sup> Hellerstedt WL, Smith AE, Shew ML, Resnick MD. Perceived knowledge and training needs in adolescent pregnancy prevention: results from a multidisciplinary survey. *Arch Pediatr Adolesc Med*. 2000 Jul; 154(7): 679-84. doi: 10.1001/archpedi.154.7.679

<sup>4</sup> (2007). *Challenges in adolescent healthcare: workshop report*. Washington, D.C.: National Academies Press.

<sup>5</sup> Newhouse, R. P., & Spring, B. (2010, November 11). Interdisciplinary evidence-based practice: Moving from silos to synergy. *Nursing Outlook*, 58(6), 309-317. doi:10.1016/j.outlook.2010.09.001

<sup>6</sup> American Board of Medical Specialties. (2012). ABMS 2012 Certification Statistics. Retrieved January 2, 2015, from [http://www.boardcertifieddocs.com/pdf/Resources\\_certification\\_statistics.pdf](http://www.boardcertifieddocs.com/pdf/Resources_certification_statistics.pdf)

example, the percentage of time that providers spent with a patient confidentially increased from 47% at baseline to 82% at mid-cycle; and at baseline, only 47% of patients received a confidential risk assessment compared to 72% at mid-cycle. Year-end data will be available 9/1/15. In evaluating the Adolescent Champion core content trainings, 94% of participants rated the model as “Excellent”, and 100% indicated that they “intended to change their practice based on participation in the course.” AHI is currently collecting data on patient satisfaction, adolescent health quality performance measures, and provider and staff knowledge and attitudes. This data will be available in 2016.

**Lessons Learned:** The model was initially developed to recruit and train physicians as Adolescent Champions. Early in the first cohort it became evident that training interprofessional champion teams of providers, managers, nurses, social workers, and other health center staff was substantially more valuable and effective in driving practice change.

**Future Applications and Next Steps:** The UMHS Adolescent Health Initiative is positioned to lead the transformation of high quality adolescent health care practices throughout Michigan and across the country. AHI will begin a third cohort of Adolescent Champions in October 2015 with 10 additional primary care health centers Michigan and is currently in discussions to implement the model with state agencies and health care systems across 8 states.

## ***Health Professions Education Day – Poster Abstract***

### **Community Health Nursing – Vision Through a Global Lens**

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Gallagher, N.A., PHD, APRN-BC;  
Rana, G.K., MLIS;  
Saylor, K., MSI;  
Abbott, P. PHD, RN, FAAN

#### **Background:**

Community Health Nursing is a required senior-level undergraduate clinical course at the University of Michigan School of Nursing (UMSN) in which students learn to assess and address the health of populations and communities. The course includes didactic and applied clinical experiences, with nine clinical groups - each practicing in surrounding counties. In 2012, an initiative was developed to further internationalize the nursing curriculum. The objective was to enhance the students' sense of global engagement and cultural understanding. While an optimal international learning experience would be to enable all students to travel abroad, logistical, financial, and safety concerns posed significant barriers. Therefore, we capitalized on available resources, information technology, and supplemented with targeted international travel. This combination of experiences and resources has empowered students to think globally and act locally.

#### **Methods:**

Small group immersion experiences in Quito, Ecuador and New Delhi, India have been made possible using small grant funding. Videoconferencing was piloted with partner nursing schools and students in Léogâne, Haiti to enable outreach where travel is not feasible. Aware that exposure to cultural experiences is not limited only to those who travel, our local student groups are immersed in a variety of highly diverse communities in Southeastern Michigan. To further their experiences, we utilize technology to "reach and teach" in distant areas. In example, we utilize class blogs for students from many nations to discuss and debate, and we heavily utilize videoconferencing to connect classrooms around the globe with the classroom at University of Michigan (U-M) and a WHO-sponsored, electronic Community of Practice website to share course materials, open-access information resources curated by U-M's Taubman Health Sciences Library informationists, and student-created content..

#### **Outcomes & Evaluation:**

Evaluation data continues to be collected from local and international students to assess learning and for quality improvement. Lessons learned and course revisions based on evaluations will be discussed.

#### **Going Forward:**

Combining physical and virtual approaches enables us to maximize experiences. Language differences and use of communication technologies pose challenges but also result in valuable learning and teaching moments. Also, continuing opportunities arising from connections with India, Ecuador and Haiti have enabled expansion into other locations including Botswana. This expansion has been accompanied by increasing internal interest among faculty and students, resulting in the formation of an interprofessional interest group within UMSN directed towards long-term sustainability. UMSN has built a template infrastructure to drive internationalization of the curriculum now and in the the future.

Grant funding for the initiative was provided by; the U-M Center for Research on Learning and Teaching; a U-M Transforming Learning for a Third Century grant; the Office of the Vice-Provost for Global and Engaged Education; and a U-M India Initiatives grant.

## Theory, Process, and Validity Evidence for a Staff-Driven Medical Education Exam Quality Improvement Process

Zaidi, N, PhD; Grob, K, MA; Yang, J, MA; Santen, S, MD, PhD; Monrad, S, MD; Miller, J; and Purkiss, J, PhD

### Background:

Assessment drives student learning. While assessment programs use a variety of testing methods, medical education relies heavily on multiple-choice questions (MCQ), which may not assess all cognitive levels of learning (Thompson & O'Loughlin, 2014; Tractenberg, et al., 2013). Compelled by evidence that supports the use of MCQ items to probe all levels of learning, a modified Bloom's Taxonomy rubric was created to classify examination questions used in our medical student curriculum. This modified, two-level Bloom's Taxonomy rubric was then applied in a staff-driven exam review process.

### Methods:

We examined item-level metrics and exam score outcomes for examinations administered across all required second-year basic science pre-clinical courses as well as scores from the USMLE Step 1 examination. Our analysis focused on performance data from all 353 students enrolled as second-year students during the 2014 and 2015 academic years.

### Results:

Fewer students answered Higher Order questions correctly, on average ( $M=84.44$ ), as compared to Lower Order questions ( $M=87.41$ ), and the difference was statistically significant ( $t(1970)=3.92$ ,  $P<.001$ ). The effect size for this difference, as measured by Cohen's  $d$ , indicates a small but notable effect ( $d=.19$ ). Additionally, the mean discrimination index for Higher Order questions was also higher ( $M=0.16$ ) than for Lower Order questions ( $M=0.13$ ), and the difference was statistically significant ( $t(1970)=-3.70$ ,  $P<.001$ ). Again, the effect size for this difference, as assessed by Cohen's  $d$ , indicates a small but notable effect ( $d=.18$ ). A statistically significant, positive correlation was also found between students' cumulated performance on Higher Order questions and USMLE Step 1 scores ( $r=.44$ ,  $P<.001$ ) as well as a statistically significant, positive correlation between students' performance on cumulated lower order questions and USMLE Step 1 scores ( $r=.43$ ,  $P<.001$ ). The differences between correlations was not statistically significant.

### Lessons and Next Steps:

Using a modified, two-level Bloom's Taxonomy rubric, we found that Higher Order classifications identified MCQ items that are more challenging for our students. This provides validity evidence for a significant enhancement to our staff-driven exam quality improvement process, aimed at promoting items that assess higher-order learning. A more comprehensive evaluation of validity will include assessment of inter-rater reliability between substantive content experts and assessment staff, which provides direction for future work. Further content validity will be gathered through analysis of subsequent years, assessing for an increase in higher order questions.

## **Developing the Learner Portfolio Framework: an iterative process**

Patton, J, MD, MHI; Hollar, S, MSI

**Background:** To support the medical student curriculum transformation, the Learning Informatics group is developing a learner portfolio that will expand the concept of portfolio beyond a repository of student artifacts. The Learner Portfolio will include context-based progress tracking, learning analytics and metadata to tie assessments, reflections and activities to outcomes and competencies. The Learner Portfolio will track the student's progress longitudinally over their academic career.

**Intervention:** The first iteration of the Learner Portfolio includes mechanisms for student reflection and discussion, storage of student artifacts and the Outcomes Dashboard, which tracks individual student learning outcomes from multiple sources in a single interface. The Fall 2015 version of the Dashboard uses metadata to map assessment outcomes to curricular competencies and will track student progress toward meeting competencies over time. This first instantiation of the Learner Portfolio will serve as a foundation for future versions, which will offer more a robust tracking feature and finer levels of granularity.

**Lessons Learned:** Student outcomes data resides in multiple systems at various levels of granularity and differing access mechanisms. Integrating these sources into the Learner Portfolio has been challenging. It will require multiple iterations to fully realize the vision for the Learner Portfolio. A clearly recognized requirement is that faculty and staff will need mechanisms to quickly identify where students may be encountering challenges based on their learning outcomes.

**Future Applications and Next Steps:** Students and faculty will use the first version of the Learner Portfolio in Fall 2015. We will gather feedback from faculty and students after they have experienced the tools as part of their routine workflow.

We will explore mechanisms for automatically identifying student performance problems, as well as the feasibility of creating a student outcomes data warehouse to populate the Learner Portfolio. Based on feedback from faculty and students, we will refine the Outcomes Dashboard to address shortcomings and areas for improvement.



## Innovation in Medical School Admissions Interviews

Zaidi, N, PhD; Santen, S, MD, PhD; Purkiss, J, PhD; Teener, C, MA; Gay, S, MD

### Background:

The medical school admissions interview (MSAI) remains an important and ubiquitous component of the admissions process. While the MSAI varies across institutions, there are two commonly used formats—a traditional one-on-one interview, which can be unstructured or semi-structured, and a highly structured multiple mini-interview (MMI). There are notable advantages and disadvantages associated with both assessment methods (Eva et al., 2004; Kumar et al., 2009). This warrants the consideration of a hybrid approach that combines both interview formats. A hybrid interview approach has the potential to elicit more reliable scores through multi-sampling (i.e. MMI) techniques while capitalizing on the strengths associated with traditional MSAI methods.

### Methods:

At the University of Michigan Medical School, our admissions committee adopted a hybrid interview approach to select our entering class of 2015. Our hybrid interview uses a combination of “short-form interviews” (i.e. MMI) and traditional “long-form interviews.” The short-form interviews are highly structured with scenarios purposefully designed to elicit specific skills that align with our new institutional competencies. Conversely, the long-form interviews are semi-structured in that interviewers are provided a few standard questions to ensure consistency among interviews; however, the majority of the interview is intentionally unstructured. The short-form interview process consists of six, scenario-based encounters with a single rater, and the long-form interview process consists of two, 30-minute interviews with a single interviewer. Skills that were assessed in both interview formats were analyzed for association using a series of Pearson correlations.

### Results:

After one year of data (N=514), there is initial support to suggest that long-form interviews are measuring different aspects than short-form interviews. The scores from each format seem to be operating independently as evidenced through moderate to low correlations ( $r=.091-.402$ ) for the same skills measured across different formats. For example, the correlation between communication on the long-form interview and the short form interview was  $r=.402$ . These results provide some evidence of discriminant validity, which may suggest that these two interview formats measure the same skill differently. While we believe these interview scores represent the same skills measured differently within each format, we also recognize that these interview scores might represent *different* skills measured differently within each format. Nonetheless, these initial results suggest that unique data is collected by each format.

### Lessons and Next Steps:

While these initial outcomes provide support for the hybrid interview approach, further analysis is needed. Additional analysis will examine construct validity for this hybrid interview process by determining whether the short-form interview and long-form interview scores represent the skills intended for assessment. Additionally, as we continue to implement our new competency-based curriculum, we plan to use data collected from both interview formats to establish a baseline for entering students' competencies. Therefore, future analysis will include validity studies to

determine if we are measuring the skills intended for assessment and whether these data can be used to identify student deficiencies and develop early remediation plans.

## **Pilot of introductory training about electronic health record (EHR) systems using the VistA-for-Education (VFE) system**

Abbott P, PhD; Patton J, MD; Flynn A, PharmD; Glaser D, BS; Smith E, BS;  
Grum C, MD; Clay M, MD; Friedman C, PhD

**Background:** Health professions education programs now have a need to provide training about electronic health record (EHR) systems for future health professionals. It is not clear precisely what this EHR training should entail or how best to deliver this educational content. Within the University of Michigan Medical School, a pilot was conducted in May of 2015 using an active-learning curriculum and the VistA-for-Education (VFE) open source EHR system. Insights were gained that will be applied to further develop conceptual and hands-on EHR training for health professions students.

**Intervention:** A two-session, six-hour, hands-on active learning EHR curriculum was delivered to nine first-year medical students, including the following content:

### 6 aspects

- *What an EHR is and is not*
- *Safe use of an EHR*
- *The EHR as a source of information*
- *The EHR as a documentation tool*
- *Using the EHR to help manage work*
- *Using clinical decision support features*

### 4 hands-on activities

- *Scavenger hunt – Getting data from an EHR*
- *Documenting tasks and clinical thinking in an EHR*
- *Creating patient lists and reports*
- *Processing reminders and alerts and placing orders*

**Results:**

**Lessons Learned:** The primary lesson learned was that first-year medical students reported benefits from attending the 6-hour introductory EHR training course, most notably that their comfort level in using an EHR improved. These results suggest the students developed new skills and gained insights about EHRs from using VFE to complete a series of simulated activities that based on everyday physician tasks.

**Future Applications and Next Steps:** A plan to further develop the VFE-based curriculum used during the pilot for the upcoming Initial Clinical Experience (ICE) program for first-year medical students is currently being executed. Future plans involve developing case-based educational units that make use of simulated patient files in the VFE EHR to deliver clinically-oriented lessons to health professions students.

## Developing and deploying free, adaptable digital learning resources to enhance postgraduate curricula partnerships in sub-Saharan Africa

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<sup>1</sup> University of Michigan Medical School, <sup>2</sup> University of Michigan Taubman Health Sciences Library, St. <sup>3</sup> Joseph's Hospital and Medical Center, <sup>4</sup> Albert Einstein College of Medicine

**Background:** The 1000+ OBGYNs in Africa project (<http://www.1000obgyns.org/>) was launched in 2012 to strengthen regional capacity in specialized obstetric care for maternal and neonatal health across sub-Saharan Africa. The project resulted in the creation of a network with 30+ institutions - a mix of African and U.S. universities and professional associations - with the common goal of training 1,000 new residents in obstetrics and gynecology in sub-Saharan Africa by 2025. A qualitative analysis of the survey and interviews at the member meetings in 2012 and 2014 revealed that access to affordable, relevant, and up to date research and instructional material was a significant barrier to instructors and learners in OBGYN residency programs.

**Methods:** The 2012 meeting was recorded, transcribed, and formatted into formal proceedings with case studies about OBGYN residency programs in 10 African countries. At the 2014 meeting, members collectively identified 14 “hot topics” or priority areas for the curriculum. Of these topics, the members settled on one topic - hypertensive disorders of pregnancy - to create a full course. This course was created, with mostly new material authored by network members, and delivered in June 2014 as 1-week instructor-facilitated interactive online course freely available but only to members. For the remaining 13 hot topics, a curriculum team of 4 OBGYN faculty and 3 information resources specialists identified key terms for each of the topics and selected 10-15 free websites to search, depending on the topic. Websites were a mixture of professional associations identified by OBGYN faculty, Creative Commons-licensed health collections previously curated by the Open.Michigan Initiative, and open access databases previously curated by the Taubman Health Sciences Library. The team reviewed the search results for relevance, for audience fit, for free, public access, and for copyright permissions. Following the completion of the hot topics, there was a request from members to organize the materials to more closely align with the competencies or milestones that were common across the varying curricula. The curriculum team selected the ACGME Milestones for OBGYN to organize the collection and repeated the same search, review, and formatting process for the 25 milestones as the 13 hot topics. Due to Internet connectivity costs and unreliability, the member institutions in Africa requested online and offline access for the convenience of their residency programs. The curriculum team partnered with the Global Library of Women’s Medicine (GLOWM) to include all 4 collections in a special edition of GLOWM’s offline compressed USB drives distributed through their Ambassador Program.

**Results:** Four new collections have been developed and shared since 2012: the proceedings book, the online course, the collection of hot topics, and the collection of milestones. These new collections developed by this partnership cover a diverse range of subjects, including abnormal uterine bleeding, pregnancy complications, vaginal surgeries, pelvic masses, newborn care, postpartum care and family planning. All materials are publicly available, free and licensed for students, teachers and practitioners to copy and modify to suit their curricular context within their own institutions. All of the collections have been shared under Creative Commons licenses and added to the Open.Michigan website (<http://open.umich.edu/education/med/1000obgyns/>) as the primary location. Since the collections have been added to the Open.Michigan website in 2013-2014, the collection page has received 2507 unique pageviews, the book 115, the online course 149, the hot topics 249, and the milestones 1655. The proceedings book is also available for purchase for print on demand via Amazon.com, where it has sold 17 copies to consumers. The collection of 15 videos with 79 minutes of instruction for the online course was uploaded to the Open.Michigan YouTube channel, where they have received 915 views to date. The GLOWM compressed USB drives were distributed to 18 African institutions - with 32GB total of digital content - half of which were the resources for the 4 new collections by the 1000+ OBGYN network of institutions and the other half the full GLOWM digital collection.

**Lessons Learned:** Through this multi-institutional, multi-departmental collaboration, the 1000+ OBGYNs Project was able to effectively draw upon existing free and openly licensed educational resources from Michigan, Ghana, Ethiopia, and other medical schools around the world and to review, curate, and organize them for a learner audience of OBGYN residents. The partnership revealed the necessity of peer review by subject matter experts to determine the quality, audience fit, and categorization of the learning resources and review by information resources specialists for copyright permissions, for file organization, and for appropriate metadata for browsing and searching such a large collection. Through strategic partnerships with established brands and media channels of Open.Michigan and GLOWM, the 1000+ OBGYNs network was able to increase the visibility of, access to, use of the four collections, both online and offline.

**Future Applications and Next Steps:** A second book with the proceedings from the 2014 meeting is currently in progress and planned for publication in October 2015. A third meeting for the 1000+ OBGYNs network members is planned for October 2015. This meeting will be opportunity to promote even greater awareness of the existing 4 collections and to gather feedback on the usage of and suggested improvements for the online collections and the offline GLOWM USB drives. The 4 new collections that were added to the GLOWM USB drives are slated to be added to the GLOWM website by the end of 2015. Leadership of the 1000+ OBGYNs network are currently in discussion with new emerging maternal and reproductive health networks in Ethiopia and East Timor about adapting or adding to the four collections to support their own training programs.

**Acknowledgements:** The 1000+ OBGYNs project has received funding from the Flora Family Foundation, the World Bank, and the Bill and Melinda Gates Foundation.

# **Utilizing an Interprofessional Simulation Platform to Instruct the Use of a New Electronic Health Record**

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## **BACKGROUND AND OBJECTIVES**

Implementation of a new EHR must address the needs of multiple team members and various workflows. Patient safety can be compromised if users are under-prepared. This study evaluated the effectiveness of a simulation training curriculum based on pairing physicians and nurses together to learn a new EHR. Rapid-cycle improvement was used to identify and fix workflow issues.

## **METHODS**

Faculty and residents from Obstetrics and Family Medicine, Midwives, and nurses participated in 64 simulations over 4 weeks. Physician/nurse teams admitted, delivered and treated a post-partum hemorrhage on a birthing simulator while documenting in the actual EHR. Learners completed pre/post-surveys regarding their satisfaction with this experience. Each session lasted 2 hours, including a 30-minute debrief. Data collection included workflow optimizations reported to EHR build-teams for rapid-cycle improvement.

## **RESULTS**

A total of 188 participants (Faculty: 46, CNM: 24, Residents: 34, Nurses: 84) completed training. The intervention was perceived as useful, created the desire to participate in more simulations, and decreased anxiety. Debrief session observations resulted in a 20-item FAQ distributed to increase uniform use of EHR.

## **LESSONS AND CONCLUSIONS**

This study demonstrates that simulation provides a useful platform for preparing a large healthcare team for a new EHR. Participants found the training useful, believed it improved understanding of workflow, and found it reduced anxiety. Workflow problems and conflicts were identified and resolved prior to roll-out.

## **FUTURE APPLICATIONS AND NEXT STEPS**

The on unit, interprofessional premise of the intervention was central to its perceived usefulness and desire to participate in additional simulation training. Planning is underway to develop an interprofessional simulation training series in which on unit, clinical simulation training is used to teach a variety of obstetric care scenarios, while promoting effective communication amongst interprofessional patient care team(s).

# **Orienting First-Year Medical Students to Patient and Family Centered Care: Design and Results from a Medical School Orientation Session Facilitated by Patient and Family Advisors**

Purkiss, J. PHD; Jones, K. M.Ed.; Parent, K. BS; Sullivan, A. MS; House, J. MD

## **Background:**

Beginning in 2015, U-M Medical School (UMMS) initiated implementation of a major curriculum revision. The Initial Clinical Experience (ICE) is a core component of the new curriculum, wherein first-year medical students learn key aspects of health care from early-immersion, longitudinal clinical experiences. Three key foci of the ICE curriculum are Patients, Teams, and Systems. Partners from the UMHS Patient and Family Centered Care (PFCC) Program and ICE curriculum administrators within the Office of Medical Student Education (OMSE) collaborated to provide an orientation to patient and family centered care, at the outset of first-year students' training.

## **Actions:**

PFCC program staff developed sessions for a four-hour block during the first week of medical school, in collaboration with OMSE faculty and administrative directors for ICE. Key session objectives included increased understanding of the challenges and burdens of illness/injury on patients and their families, recognition of the benefits of patient and family partnerships at the point of care, and understanding the elements of patient and family centered care as these are applied in clinical settings. Learning activities during the sessions included an overview of PFCC; a panel representing perspectives from four patient and family stories and from one neurosurgeon; and videos emphasizing empathy, patient safety, and PFCC in action. Finally, the PFCC Advisors facilitated small group discussions allowing the students to reflect upon all elements of the orientation. Small group facilitators included 17 PFCC Advisors with background and experience in living with, or caring for a loved one living with, complex medical conditions.

## **Results:**

Students provided very favorable evaluations of how well the session achieved its goals. For each of the following,  $\geq 94\%$  of respondents either Agreed or Strongly Agreed that the session increased their understanding of: "the challenges of illness/injury for patients and families", "the benefits of patient and family partnerships at the point of care", and "the different elements of patient and family-centered care applied in clinical settings". Narrative comments from students included the following: "The patient panel and videos were very moving. It felt like an honor to engage in such raw discussions. I greatly enjoyed this [session]"; "It genuinely provided me several new lenses through which I view the delivery of healthcare by a physician and the importance of individualizing care for each patient"; "This was by far my favorite [orientation session], I wouldn't change anything about it".

## **Lessons Learned:**

The success of these orientation sessions was promoted by selection of PFCC Advisors who were unbiased, able to provide content at the appropriate level for first year medical students, and able to share personal stories illustrating PFCC principles. The development, design and implementation of PFCC Advisory training specifically for facilitation of the ICE sessions were critical components that promoted successful reflection and discussion. Patient and family advisors have unique perspectives and extensive expertise in patient and family centered care, and can contribute significantly to related medical school curricula. UMHS PFCC Program staff developed a valuable orientation to patient and family centered care, which was well-received by early, first-year medical students.

## **Next Steps:**

Since the attitudes, skills, and practices associated with patient and family centered care are not achievable through a single educational experience, it is important to carry PFCC principles throughout longitudinal curricula if genuine translation into practice is to be expected. Recognizing significant value in these initial



sessions, PFCC and OMSE partners will review program evaluation data to identify strengths and areas for enhancement, and will provide similar sessions in the future.

## Journal Club and Statistical Literacy in a Sleep Medicine Fellowship Program: A Novel Curriculum

Shelgikar, AV MD; O'Brien, LM PhD; Haftel, Hilary MD, MHPE

**Background:** Physicians in clinical practice often lack the statistical literacy necessary to correctly interpret published clinical research data (Anderson et. al. 2013; Anderson et. al. 2014). Traditional journal clubs do not equip trainees in graduate medical education programs with knowledge and skills needed to understand and apply concepts of evidence-based medicine (Green 2000). This journal club curriculum was developed and implemented to teach sleep medicine fellows how to incorporate critical analysis of published research into daily clinical practice.

**Actions, Methods, or Intervention:** This curriculum developed using the conceptual framework outlined by Kern and Thomas (2010) and was further informed by available literature on similar curricula. The curriculum designated a 3-fellow team for each journal club session: team leader and case presenter, study design and methods presenter, statistical analysis and results presenter. The type of study design discussed at each journal club session was organized in a “crescendo” fashion, starting with a case study or case series and culminating in discussion of a multicenter clinical trial. Fellows’ performance was assessed using a pre-test, post-test design that included 20 knowledge questions, 4 questions about comfort with skills and 4 questions about attitudes (Madigosky 2006).

**Results:** Seven fellows participated in the curriculum. Fellow performance was assessed with a pre-test/post design across the following domains: Knowledge (20 questions), comfort with statistical literacy skills (Likert scale, 1=strongly disagree, 5=strongly agree), and attitudes about understanding of statistics and study design for physicians with clinical responsibilities (Likert scale, 1=strongly disagree, 5=strongly agree). Mean scores (pre-test; post-test) improved in all domains: Knowledge (13.4; 14.4), Skills (2.9; 4), and Attitudes (3.5; 4.1)., Five fellows had improved pre-test/post-test knowledge scores, whereas 2 had higher pre-test knowledge scores. All 7 fellows showed progression from neutral to increased comfort with statistical literacy skills. Six fellows showed change in attitudes from neutral/disagreement to increased agreement that understanding of statistics and study design are important for physicians with clinical responsibilities. One fellow showed a change in attitudes from strong agreement to neutral/agreement about the importance of statistical literacy for clinicians.

**Lessons Learned:** This journal club curriculum appears beneficial to sleep medicine fellows in a clinical training program. One change to consider is to eliminate the specification of study design to be discussed but to continue with the context-based and team approach. This would allow more flexibility in the curriculum, but would still facilitate increased statistical literacy in the context of clinical scenarios encountered by the fellows.

**Future Applications and Next Steps:** Aggregate data from multiple learners, collected longitudinally across fellowship classes, would provide more robust data about effectiveness of the curriculum. Systematically collecting faculty feedback would be instructive to future iterations of the curriculum. The ultimate endpoint is to While improve patient outcomes via changes in fellows’ knowledge, skills, and attitudes on statistical literacy. However, the learners graduate from the fellowship program soon after completion of the described curriculum, and it

would be difficult to track patient-related outcomes related to the fellows' practices once the fellows leave the institution.

## What are the Most Important Attributes of a First-Year Medical Resident? Insights for Medical Education from Ten Years of Resident Survey Data, 2004-13

Purkiss, J. PHD; Miller, J; Zaidi, M. MD; Ross, P. PHD, Grob, K. MA; Zaidi, N. PHD, Santen, S. MD  
PHD

**Background:** For a variety of reasons, undergraduate medical education (UGME) programs endeavor to remain attuned to the nature and needs of graduate medical education (GME) programs. For example, residency match outcomes provide key metrics by which the quality of UGME programs are measured. In 2014, AAMC published *Core Entrustable Professional Activities for Entering Residency*, which specifies integrated activities all entering residents should be expected to perform on day 1 of residency. This publication has already proven deeply influential in shaping curricula at numerous US medical schools. While this type of formal guidance from GME leadership and national organizations provides critical insight for appropriately aligning UGME programs with GME needs, what related insights might be gained from learners who just experienced their first year of residency? This project aims to provide additional perspective on how UGME programs can best prepare their learners, by analyzing ten years of survey data from residents asked to identify the most important attributes interns should have during the first year of residency.

**Methods:** As part of its program evaluation processes, U-M Medical School administers a voluntary-response survey to its medical school graduates, following their first year of residency. One survey item asks respondents to “describe the top two attributes of a well-prepared resident at the end of year 1”; responses are open-ended text. Following combination of responses from the ten-year period 2004-2013, 875 text responses were available for coding. An MD and a PHD medical educator reviewed responses independently, each developing a list of descriptive-phrase codes representing the range of themes across all responses; their lists were then compared and consolidated to generate a final list for coding the data. Five coders then used the list to identify the most prevalent themes. Each response was coded twice, independently, by two coders blinded to the other’s work. The initial agreement rate was 79.2%; all discrepant codes were reviewed and reconciled. Coded results were then tallied to identify the most frequent themes.

**Results:** There was notable diversity in the attributes residents identified as important. Still, some were mentioned much more often than others. Among the ten most-frequently identified themes, the attribute specified most frequently was *Efficient* (17.5% of responses), with *Sound Clinical Judgment* (13.4%) and *Knowledgeable* (10.2%) coming next. The next tier of attributes occurred with frequencies less than 10%: *Self-Aware of Limitations* (6.2%), *Hard-Working / Dedicated* (6.1%), and *Self-Directed / Lifelong Learner* (5.0%). Four other attributes were in the top ten in frequency, though all occurred with frequencies less than 5%: *Able to Integrate / Apply Knowledge* (3.7%), *Communication Proficiency* (3.5%), *Teamwork* (3.3%), and *Patient Management Proficiency* (3.3%).

**Lessons Learned:** A key finding from our study is that *efficiency* was the theme most frequently identified as a top attribute of a well-prepared resident. While other frequently-occurring attribute themes are ubiquitous, explicit goals of UGME curricula (e.g. *knowledge* and *clinical judgment*), or are covered with increasing scope and frequency (e.g. *teamwork* and *self-directed learning*), we know of no robust UGME curricula for fostering efficiency. This finding points to a gap in UGME preparation of graduates for residency. We were also struck by the diversity in attributes residents identified as important, and the broad distribution of frequency across them. The first step of our coding process identified 25 different attribute themes among 875 responses, and among the 10 most-frequently mentioned themes, only three occurred with frequency greater than 10%. This finding provides further illustration of the breadth of expectations for UGME.

**Next Steps:** Future work will examine whether and how differences in residency specialty influence which attributes are identified as most important for residents, and whether there are changes over time in which attributes are identified most frequently.

# **Integrating Medicinal Chemistry and Pharmacology into a New Course Sequence in the PharmD Curriculum**

**Mustapha Beleh, PhD, Melanie Engels, PharmD, and George Garcia, PhD**

## **BACKGROUND AND OBJECTIVES**

As part of the curricular revision initiated in the fall 2010 term at the University of Michigan College of Pharmacy, pharmacology and medicinal chemistry were combined into one course sequence named Principles of Drug Action. This integration, coupled with a higher commitment to active learning and alignment with clinical coursework, attempted to address numerous redundancies and gaps, the occasional disconnect between the original two course sequences, and a perception by students of a lack of relevance of these disciplines to pharmacy and pharmaceutical care. The objective of this study was to evaluate the implementation of the integrated medicinal chemistry / pharmacology course sequence and its alignment with the therapeutics series.

## **METHODS**

Each topic was divided into modules consisting of 2-hour lecture blocks, and the content was integrated and aligned with the therapeutics series. Recitation sessions emphasizing application skills in an interactive environment followed each set of three 2-hour blocks. To ensure that students achieved competency in each unit, students failing any unit examination were encouraged to undergo in-class remediation. Student feedback was collected by an independent researcher through social media, focus groups and end of the semester surveys and relayed anonymously to course directors for mid-course and post-course improvements. The study examined students' performance and student ratings prior to integration as compared to post-integration.

## **RESULTS**

Responses from surveys, interviews, and student ratings of faculty members and of courses were used to implement changes for future editions of the courses. The majority of students and faculty members felt the integration and alignment processes were beneficial changes to the curriculum. Elements of the new sequence, including remediation, were viewed positively by students and faculty members as well. Student performed slightly better (statistically insignificant) in the new integrated course sequence, while responses to the core questions of the course ratings were significantly higher ( $p < 0.05$ ; unpaired two-sample t-test) post-integration.

## **LESSONS LEARNED**

Integration of basic science courses and alignment with clinical coursework may improve communication between faculty members, address shortcomings of separate courses such as redundancies and/or gaps in content, provide better opportunities for active learning and applications to the clinical setting, and highlight the relevance of these basic science disciplines to pharmaceutical care. In-class remediation ensures

that all students completing the course achieve an acceptable level of mastery in all individual sections of the course.

# Using Stories to Teach Across Disciplines: A Successful Model

Brennan, ML, MPH  
Yorke, A, PT, MPT, NCS

**Background:** "Tell me a fact and I'll learn. Tell me the truth and I'll believe. But tell me a story and it will live in my heart forever."  
- Indian Proverb

Storytelling as a teaching mechanism is highly effective on multiple levels. Storytelling can facilitate critical thinking skills, is memorable, offers a personal touch point and can help build bridges between multiple disciplines and creates real world learning as opposed to isolated experiences. This presentation will demonstrate a unique interdisciplinary collaborative teaching model that is currently being successfully implemented through partnership with Public Health and Health Sciences and Physical Therapy departments at the university level. The use of storytelling combined with interdisciplinary teaching facilitates continued learning, interest and education in a new discipline, collaboration with peers, making connections between what is known and new ideas, working from new and different perspectives, problem solving, creativity and critical thinking among students.

**Actions, Methods, or Intervention:** This presentation will be comprised of representatives from two separate disciplines: public health and health sciences and physical therapy. Audience feedback and participation will be solicited. We want this to be an interactive session, which will model how we have used collaborative teaching within the classroom. While not always easy to do, we firmly believe that interdisciplinary teaching combined with storytelling creates a rich learning environment for students.

**Results:** 1. Participants will experience and learn teaching by storytelling through modeling. 2. Participants will learn how to utilize storytelling across disciplines within their own educational and organizational settings. 3. Participants will learn how to effectively use cross disciplinary teaching to more successfully promote long term learning and critical thinking skills.

**Lessons Learned:** Through evaluation mechanisms, we have found this format to be very successful in creating a positive and synergistic learning environment. Feedback has been overwhelmingly positive in physical therapy and radiation therapy classes, as well as at conferences. Anecdotal comments from evaluations include:

*"Her experience showed us how important quality care is."*

*"Interactive, interdisciplinary, authentic sharing. Applies to many fields"*

*"The ideas and examples were great – real examples of how this is being done in various interdisciplinary contexts."*

**Future Applications and Next Steps:** We are looking to expand this model to other departments and settings. We are currently working with our Radiation Therapy department to integrate this model into their curriculum. In addition, we are exploring ideas to use the model more proactively in our Public Health and Health Sciences courses.



# **Comparison of Data Collection Forms used in Adverse Event Reporting by US Dental School Clinics**

Rooney, D, PhD; Barrett, K; Bufford, B; Hysten, A; Loomis, M; Smith, J; Svaan, A; Pinsky, HM, DDS; Sweier, D, DDS, PhD

## **Background:**

To be eligible for accreditation US dental schools must conduct and maintain a formal system of measurable criteria for quality improvement to ensure patient safety and accountability for adverse events (AE) that occur in dental school clinics. However, there is no universal reporting system or regulating body designated to collect, record, interpret, or release findings or trends pertaining to AEs in dental school clinics. Although minimal, existing literature suggests that AE reporting processes in dentistry would benefit from standardization. The objective of this study is to compare similarities and differences among the AE reporting forms currently in use at US dental schools.

## **Actions, Methods, or Intervention:**

A sample of 16 (24%) American Dental Education Association member dental schools responded to a query to provide (blank) copies of their AE forms currently in use. The forms were reviewed and cross-checked for identification of unique requested AE items. A total aggregate of 69 unique AE items were identified, grouped, and ranked according to frequency. Additionally, methods of AE data collection were also noted, e.g. free response, menu, or a hybrid.

## **Results:**

The forms were markedly different in organization, form, and content. Likewise, the aggregate of 69 AE items identified represented a wide variety of information, with no apparent standardization regarding the type of information, how it was collected, or by whom. We identified nine most requested AE items and four least requested AE items. Additionally, the schools differed in how the information was obtained: two schools used a menu, eight schools used free response, and six schools used a hybrid of both methods.

## **Lessons Learned:**

The first conclusion was that dental school clinic AE reporting forms are not standardized in form, organization, or content. There is a wide variety of information requested with varying frequencies. The second conclusion is that a hybrid guided response (menu) and free response form would ensure that the proper information is being reported to fully understand why/how the AE occurred. The third conclusion is that a standardized method of collecting and assessing AE data will allow for quality improvement and increased patient safety.

## **Future Applications and Next Steps:**

Future studies may reveal telling information relating how AEs are reported and how reporting mechanisms relate to meaningful changes in school clinic policies and AE prevention. Data collection and surveillance at a national and institutional level will help identify trends and common problems. This will enhance the translation of the

information to schools and give them the opportunity to provide and receive feedback on their own performance.

## Using interprofessional student teams to teach contemporary interprofessional practice in healthcare

Sweet, Gundy, PharmD; Arslanian-Engoren, C, RN, PhD; Fitzgerald, M, DDS, MS; Hornyak, J, MD; House J, MD; Madeo, A, MPH, MSW; Mattison, D, MSW; Mueller, B, PharmD; Pardee, M, DNP; Stojan, J, MD; Sweier, D, DDS, PhD; Zebrack, B, MSW, MPH, PhD

**Background:** Financial and quality concerns are forcing health care systems to demand more effective interprofessional collaborations. While translational research has allowed basic and clinical health scientists to collaborate closely in order to maintain competitive *research* programs, development of intentional interprofessional *learning* environments has lagged behind. The challenge before health science schools is to incorporate meaningful interprofessional education (IPE) into their curricula so that students are better equipped to enter and shape contemporary interprofessional practice.

**Actions, Methods, or Intervention:** In 2014, responding to both the intrinsic demand to provide better health care and the extrinsic demands of educational accreditation bodies, the leadership of five health science schools at the University of Michigan made a pact to create a course that would bring their students together, to learn with and from one another, with the goal of better preparing them for the future of team-based clinical care. Over the course of a year, an interdisciplinary team of 11 health-science faculty met twice monthly to build a new course from the ground up. The 2-credit course, entitled Team-Based Clinical Decision Making, is designed to allow students to learn about interprofessional collaboration through hands-on experience in a multidisciplinary team. It focuses on two core competencies for IPE: understanding professional roles and developing teamwork skills. Through a series of carefully designed learning activities, using the principles of adult learning, students teach each other about their respective disciplines, critically reflect on their own work within the team, and set goals for future team interactions.

**Results:** The course, which was successfully launched in winter 2015, enrolled over 250 students from five health science schools (Dentistry, Medicine, Nursing, Pharmacy and Social Work). Students were assigned to fixed interprofessional teams for the entire term. Over 85% of students reported learning about each other's professional roles and what each discipline contributes to the team, and how to consider multiple viewpoints when making clinical decisions. Approximately half of the teams saw an increase in their teamwork scores by the end of the term. Over 70% of students reported having more confidence in representing their profession to the team. Change in perceived likelihood for future collaboration with each of the other professions was less universally affected. However, both pharmacy and dentistry students saw an increased likelihood of collaborating with social workers by the end of the course.

**Lessons Learned:** This course was designed to impact students' *knowledge* of health profession roles, *attitudes* towards interprofessional practice, and *skills* for effective teamwork. While self-assessed learning gains were favorable, uneven enrollment across professions led to teams missing representatives from some disciplines. Student attitudes were impacted by the method in which the course was incorporated into the respective curricula, with key factors being whether the course was required vs elective and whether it was an add-on or replacement for an existing course.

**Future Applications and Next Steps:** The Team-Based Clinical Decision Making course is the first of its kind at the University of Michigan, bringing together more than 250 students from five health professions to learn about interprofessional collaboration in healthcare. This large-scale IPE course is scheduled to continue with the goal of becoming a required course for all students in each of the participating health-science schools.

## Supporting Learners Who Care for Socioeconomically Disadvantaged Persons: an Interprofessional Curriculum Outcomes Report

Chick, D, MD; Bigelow, A, PhD ANP; Seagull, FJ, PhD; Rye, H, LMSW; Davis, P, MD; Williams BC, MD MPH

**Background:** Many clinicians lack formal training regarding social determinants of health, public healthcare systems, or special interprofessional care needs of socioeconomically disadvantaged persons. Locally, needs assessment demonstrated provider knowledge deficiencies, compassion fatigue, and lack of confidence in ability to meet the needs of disadvantaged patients. In response, our interprofessional team developed a sharable curriculum supporting care for socioeconomically disadvantaged persons.

**Actions, Methods, or Intervention:** We identified two curricular domains supporting care of at-risk populations. Each domain was divided into knowledge modules: *Domain 1. Public Healthcare Systems* includes epidemiology of the homeless and medically uninsured, public health insurance systems, and public healthcare delivery systems; *Domain 2. Bio-Psychosocial Model of Care* includes biomedical needs of the homeless, social determinants of health, the bio-psychosocial model of health, and interprofessional team care. Each module was presented in a case-based format and housed online at [caringwithcompassion.org](http://caringwithcompassion.org). The modules are supplemented with an online learning game. The website also includes individualized learner dashboards, extension resources, a case presentation guide, and a clinical assessment tool.

**Results:** Over 2,300 clinical learners from over 300 health profession education programs across the United States have enrolled in Caring With Compassion since its launch October, 2013. It is a resource for UMMS and UMSON courses and for a cross-listed inter-professional course for DDS students, PharmD students, and Integrated Health Scholar Social Work students. National faculty have reported above average educational quality and actionable clinical improvement plans. Knowledge outcome data collection was discontinued after demonstration of highly significant improvement in examination scores following exposure to the modules and game for all assessed content areas, with two tailed T test  $p < 0.00001$  for each [n, pre-test, post-test]: epidemiology of populations in need (289, 44%, 77%); public health insurance (187, 47%, 75%); health care delivery systems (163, 40%, 74%); homelessness and disease (189, 55%, 82%); social determinants of health (191, 46%, 63%); psychosocial model of health (155, 29%, 61%); team care (165, 53%, 76%).

**Lessons Learned and Next Steps:** Curricular outcomes demonstrate enthusiastic national adoption of the Caring With Compassion curriculum and successful achievement of identified socioeconomic and sociobehavioral knowledge learning objectives. This interprofessional project required substantial individual and team effort; both funded faculty effort and a professional design and website implementation team were essential to success. With future funding, next steps will include creation of an administrative tracking portal for institutional users, and development of enhanced faculty development tools to support clinical application and learner feedback.

# Teaching End-of-Life Care to Resident Physicians Using Clinical Simulation

Chiang, C, MD; Kelley, S, MD; Petersen, K, MD

## BACKGROUND

Resident physicians receive limited education on end-of-life care despite it being a common clinical responsibility; clinical simulation may be a way to effectively bridge this gap. This study explores the feasibility of using an educational intervention, composed of written materials in an online module followed by a high-fidelity clinical simulation, to improve resident physicians' comfort and knowledge regarding end-of-life care.

## METHODS

Twenty-three resident physicians at the University of Michigan Family Medicine Residency Program completed this educational intervention while rotating through the Clinical Simulation Center (CSC). Participants submitted responses to a pre-participation questionnaire, utilizing a 7-point Likert scale and multiple choice questions, to measure their comfort and knowledge about end-of-life care. Then, they reviewed written materials in an online module regarding end-of-life communication and symptom management. During their end-of-life CSC session, participants took part in a high-fidelity simulation using the METI Human Patient Simulator, caring for a patient in an expected inpatient mortality case. The simulation included two instructors role-playing as the patient's family member and nurse. Debriefing with participants occurred immediately afterward. One half of the participants, selected by stratified randomization, repeated the online assessment at the start of the CSC session, while the other half of the participants completed the questionnaire at the end of the CSC session. Changes in participants' self-reported comfort and demonstrated knowledge about end-of-life care after each component of the educational intervention will be analyzed using 2-sample t-tests at the conclusion of data collection.

## RESULTS

Completing the online module increased participants' comfort with end-of-life care communication but not their comfort with skill. Knowledge test scores and self-assessed comfort on end-of-life care responsibilities were higher after completing both the module and the simulation parts of the curriculum compared to after the module only. This relative increase in resident knowledge with the addition of clinical simulation amounted to a moderate effect size of 0.55. The between-group differences in the pre-post score changes are approximately 1 SD unit.

## LESSONS LEARNED

Ongoing data collection is needed to reach adequate power, however we hypothesize that this educational intervention will improve resident physicians' comfort and knowledge regarding end-of-life care. We further hypothesize that there will be additional benefit from also completing the clinical simulation compared to reviewing traditional written materials alone.

## FUTURE APPLICATIONS

This study characterizes a successful and effective graduate medical education adaptation to an under-addressed aspect of routine patient care. Next steps include integrating this intervention into the residency's core curriculum and extending it to residency programs of other specialties.

## Certificate in Advanced Clinical Dementia Practice

ssw.umich.edu/clinical-dementia

Dunkle, R, PhD; Spencer, B, LMSW, MA; Starback, C, LMSW

### Background

The upward aging population trajectory in the United States will contribute to the alarming epidemic of age-related brain diseases, such as Alzheimer's disease (AD) with about one in nine older Americans, or 11%, diagnosed with AD. This rate is projected to double by 2050 if no cure or effective treatments are discovered (2015 Alzheimer's Association Facts and Figures). To meet the specialized care demands of our aging population, healthcare professionals trained in dementia care are critical. There is a recognized national shortage of geriatric specialists, resulting in a need for accessible and affordable multimodal teaching systems for interdisciplinary dementia training.

### Intervention

The University of Michigan (U-M) School of Social Work, in collaboration with the Hartford Center of Excellence in Geriatric Social Work, developed and implemented a three- month 34 CE/CME web-based interactive multidisciplinary *Certificate in Advanced Clinical Dementia Practice (ACDP)* to respond to the gap in dementia training for healthcare professionals, including physicians, nurses, social workers, health educators and related fields. The specialized curriculum involves a) interaction with an interdisciplinary team of experts including U-M faculty from neurology, geriatrics, psychiatry, neuropsychology, public health and social work; b) exploration of current trends in diagnosis and care approaches; c) focus on skill-building in person-centered care, and d) connection with peers across the nation and internationally to practice and discuss new skills and ideas.

### Results

The pilot series for the ACDP program launched in March 2015. Twenty healthcare professionals (45% social workers; 30% nurses; 15% psychologists; 10% other) enrolled and completed the program. Overall course evaluation (response rate = 90%) revealed the following mean scores based on a standard Likert scale of 1 = very satisfied to 5 = very dissatisfied: level of depth of coverage (M = 1.44); relevance to the learner (M = 1.56); effectiveness of the learning method (M = 1.50); generation of new ideas in approaches and application to broaden skill level in working with individuals and families living with dementia (M = 1.50).

### Lessons Learned

To better facilitate the peer learning experience, the next ACDP series will begin with a live webinar session to troubleshoot technology issues and engage participants in small group skill-development discussions. A few gaps in content were identified, such as approaches to working with families and late stage considerations. Course objectives were modified and new speakers joined the program to address these training needs.

### Future Applications and Next Steps

The next ACDP session is scheduled to begin on September 15, 2015. The goal is to continue to offer the program twice a year, updating podcasts to stay current in best practices. Moving forward, we would like to create an ACDP network of current and past participants to foster information sharing and collaboration.



## **Self-Efficacy, Cultural Competence, and Perception of Learning Environment in Traditional and Interprofessional Physical Therapy Curricula**

Laura Smith, PT, PhD, DPT, OCS, MTC, FAAOMPT

**Background:** Interprofessional education (IPE), a concept that brings students from different health care professions together in the learning process, has been adopted by some physical therapy (PT) schools as an alternative to traditional PT-only curricula. Both approaches have the goal of improving patient outcomes for an increasingly diverse population. There was a void in the research comparing IPE and traditional curricula in PT education. Grounded in the theoretical frameworks of adult and social learning theory, the purpose of this study was to examine differences in students' self-efficacy, cultural competence, and perceptions of the learning environment based on curricular type and prior to their first clinical internship.

**Actions, Methods, or Intervention:** The nonexperimental, causal-comparative research design was used to test a single research question about differences in the 4 dependent variables based on curriculum format (IPE or traditional) for a balanced, random sample of 218 preclinical students from 6 different PT programs.

**Results:** The results of Hotelling's  $T^2$  and post hoc analysis revealed statistically significant, higher self-efficacy scores for students in IPE curriculum than ones in the traditional curriculum. No significant differences were found related to cultural competence and perception of learning environment.

**Lessons:** The positive social change implication for this research was that preclinical PT students' in an IPE curriculum had increased self-efficacy as compared to those in traditional curricula. This information can be used to provide direction for PT programs as they work toward delivering exceptional educational experiences in order to improve patient outcomes and better society.

**Future Applications and Next Steps:** Results suggest that future research could examine the relationship between self-efficacy and cultural competence in other health care students. Additionally, intentional curricular changes could be explored as a way to create IPE experiences for all health care students and develop the core constructs of IPE and collaborative practice early in the educational process.

## **Humanizing Technology to Improve Clinical Readiness for Advanced Practice Nursing Students**

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Boucher, N. PhD, CPNP; Kuzma, E. DNP, FNP-BC

**Background:** The primary mission of the University of Michigan School of Nursing primary care nurse practitioner programs is to prepare exceptional clinicians for advanced nursing practice who will grow to be leaders in healthcare. In 2013, students had access to digital standardized patients (DSP). DSPs offer a safe learning environment for students to develop and practice patient-provider communication and advanced physical exam skills and improve self-efficacy in health assessment competencies. Despite the benefits of using a DSP, there is still a need for exposure and experience with live patients outside of healthy peers.

**Actions, Methods, or Intervention:** Faculty will collaborate with the Standardized Patient Program to develop and test the addition of a novel nurse practitioner focused case scenario. This pilot Standardized Patient (SP) case will be trialed in advanced health assessment. Faculty will evaluate student performance with the SP, students' perception of the experience, students' self-efficacy with health assessment competencies, and course evaluation scores to guide revisions to the SP case scenario and direct future implementation.

**Results:** In spring/summer 2015, 43 primary care NP students completed the first SP pilot with a focus on communication skills. Quantitative data is currently being analyzed; however, anecdotal responses from students who participated were overwhelmingly positive. Students stated that the one-on-one debriefing with the SP provided invaluable information and concrete suggestions to improve patient-provider communication in the clinical setting. Students as a whole, felt pressed for time during the SP encounter, but appreciated the opportunity to hone time management skills prior to patient contact.

**Lessons Learned:** Faculty learned that the addition of the SP experience provided value that is unmatched by other types of simulation. The ability to identify students' strengths and weaknesses prior to patient contact in the clinical setting may improve patient-provider communication, especially during the initial clinical course; which is historically an area of apprehension for students.

**Future Applications and Next Steps:** Repeated exposures to SPs throughout the curriculum should increase confidence and competence in history taking, psychomotor skills, clustering of data, and clinical decision making. After the pilot case, two lead faculty will use their experience, training, and evaluation materials to train 10 additional primary care faculty to implement SPs across primary care nurse practitioner curricula, initiate new case scenarios, and develop evaluation criteria and rubrics to transform primary care nurse practitioner education and ensure long-term sustainability.

## **Teaching Oral Cancer and Oral Health Screenings to Physician Assistant Students through Interprofessional, Peer-to-Peer Learning**

Romesh P. Nalliah BDS, Elizabeth J. Eve DMD, Lisa E. Simon DMD, Veerasathpurush Allareddy BDS MMSc PhD MBA, Maria C. Dolce PhD

**Background:** Physician assistants (PA) are highly trained medical providers who have clinical expertise in comprehensive primary care. They represent a 50% cost saving compared to the cost of hiring a physician and, with sky-rocketing costs in healthcare in the United States (US), their profession has thrived. PAs are highly trained in team-based care which could make them great collaborators and a driving force for multidisciplinary, patient-centered care. However, PA knowledge of oral health is limited and this could be a major access to care opportunity. A PA working full-time has been estimated to be able to see 4,700 patients per year. If PA's were armed with oral health training and were able to deliver basic oral health counseling and perform an oral health and oral cancer screening, the impact on the nation's health could be immense.

**Actions, Methods, or Intervention:** An interprofessional, peer-to-peer oral health training program was developed for PA students (N = 64). A hands-on training on how to perform an oral health and oral cancer screening was conducted by a team of 10 dental students and facilitated by a dental faculty member. Team-based educational strategies included problem-based learning, case-studies, lecture/discussions, and online learning. Post-intervention survey was administered to evaluate effectiveness of this unique, interprofessional, peer-to-peer teaching program. Institutional Review Board approval was provided by Human Studies Committee and Harvard School of Dental Medicine.

**Results:** PA students reported overwhelmingly positive responses from receiving the training from the dental faculty and dental students. There was an increase in self-reported competence in delivering oral cancer and oral health screenings and many PA students reported an intent to administer these oral screenings on their patients. This interprofessional, peer-to-peer, case-based learning experience resulted in 12 unsolicited complimentary letters from students directed to the PA and dental faculty from students (which is about 12% of the participants).

**Lessons Learned:** Our pilot study suggests that interprofessional, peer-to-peer learning is an effective strategy to teach PA students about oral health.

**Future Applications and Next Steps:** Although initial findings were overwhelmingly positive, more research is needed to confirm the impact on practice habits of Physician Assistant students.

## **#NotAnotherBoringLecture: Using Presenter Initiated and Generated Live Educational Tweets (PIGLETs) to Broaden the Reach of the Traditional Conference Workshop**

Sarah Tomlinson, MD, Mary Haas, MD, Melissa Skaugset, MD, Stephen Cico, MD, MEd, Meg Wolff, MD, Sally Santen, MD, Rob Huang, MD

### **Background/Study Objective**

Live-tweeting of lectures, while well-described, is limited by the fact that learners control content dissemination, which can lead to misquoted or misleading factoids. The main objective of this study is to examine the feasibility and effect of presenter initiated and generated live educational tweets (or PIGLETs) to supplement the traditional lecture format and return control of social media content to the presenter.

### **Methods**

PIGLETs were created to complement the Not Another Boring Lecture workshop presented at the Pediatric Academic Societies and Society of Academic Emergency Medicine 2015 annual meetings. The presenters tweeted both summative and supplemental information during the workshop linked to two specific hashtags (#NotAnotherBoringLecture and #InnovateMedEd). These two hashtags were tracked using the TweetReach twitter analytic software to measure the number of tweets and users who used these hashtags at days 1, 2, 7, and 14 after each workshop, as well as the overall reach and exposure of the educational content.

### **Results**

A total of 126 people attended the workshops live. In comparison, the #InnovateMedEd hashtag reached 36,400 individual users, while the #NotAnotherBoringLecture hashtag reached 47,200 users. The total number of impressions generated on the two hashtags were 79,100 and 136,400, respectively. There were 636 tweets sent out by the presenters compared to 162 by learners present either live or remotely.

### **Lessons and Conclusions**

Use of PIGLETs was effective at spreading educational materials to a larger audience than would be possible at an in-person conference and are an effective tool for presenters to control their social media content. They can be used as an adjunct to the traditional lecture on both small and large scales to disseminate educational information and materials and to greatly expand the audience of learners past the confines of a live workshop or lecture.

## **Case-Based, Interprofessional Training of Oral Health to Non-Dental Students in Boston**

Romesh P. Nalliah BDS , Lisa E. Simon DMD, Elizabeth J. Eve DMD, Maria C. Dolce PhD, Veerasathpurush Allareddy BDS MMSc PhD MBA

**Background:** Healthcare delivery in the United States is highly fragmented: there are 24 recognized medical boards and each of them have subspecialties. Physicians and nurses have limited knowledge of the interactions between oral and systemic health. Yet, oral health problems are associated with about 1.3 million hospital emergency room (ER) visits and close to 51,000 hospital admissions each year. Only 1% of Massachusetts dentists practice in a hospital setting and there is a need to train medical, nursing and pharmacy students about oral health. Specifically, non-dental healthcare providers need to understand the severity and burden of oral disease in the United States, diagnose and manage basic oral health complaints, and navigate the referral system to help find a dental provider for patients.

**Actions, Methods, or Intervention:** An interprofessional oral health education program, specially designed for medical, nursing and pharmacy students, was implemented by dental students with facilitation by nursing and dental faculty. Team-based, educational strategies included problem based learning, case-studies, lecture/discussion, and online learning. Pre- and post-tests were administered and initial outcomes of this interprofessional, peer-to-peer learning experience are reported. Institutional Review Board approval was provided by Human Studies Committee and Harvard School of Dental Medicine.

**Results:** Non-dental healthcare students reported an increase in understanding of the importance of oral health and how oral health is related to overall well-being. There was also an increase in the self-reported competence in conducting oral health examinations, working in a collaborative team, making referrals to dentists, and counseling patients about oral health. Pharmacy students were less likely to report that they were competent in oral health than students from medicine and nursing. The biggest increase in rating of importance for all professions was in response to “Primary care health professionals have an important role in oral health promotion and disease prevention.”

**Lessons Learned:** Findings from this pilot study support interprofesional education in teaching oral health to non-dental healthcare students. More research is necessary to confirm if these learning achievements affect practice habits of non-dental healthcare students.

**Future Applications and Next Steps:** This was an elective experience for students. The next important step is to build oral health, interprofessional learning experiences into the curriculum of medical, nursing and pharmacy schools in the United States.

## Web-Based Video Modules for Pediatric Resident Firearm Injury Prevention and Safe Storage Education: An Innovative Approach to Advocacy Education

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**Background:** Pediatric unintentional injuries are the leading cause of morbidity and mortality among children nationally. Injury prevention anticipatory guidance provided by physicians in clinical settings is associated with cost-effective improved outcomes. Pediatric residents have an obligation to advocate for child safety and injury prevention through reinforcement of safe firearm storage practices with patients and families. A survey of University of Michigan (U of M) pediatric residents found that they rarely or never ask patients or families about firearms in the home due to a lack confidence in ability to provide proper counseling on gun safety. U of M pediatric residents currently do not receive any formalized firearm injury prevention training and exposure to educational content delivered in traditional conference venues is inconsistent. We developed a new, web-based firearm safety counseling modules for residents, delivered in a sustainable, accessible format to benefit pediatric residents and learners from other disciplines so they learn to provide appropriate firearm safety anticipatory guidance in clinical settings.

**Actions, Methods, or Intervention:** We developed a web-based curriculum addressing firearm injury prevention and safe storage counseling in collaboration with faculty from the Departments of Pediatrics and Emergency Medicine. The curriculum has been integrated into the existing Pediatric Community Health (PCH) one-month rotation beginning in July 2015. It includes a pretest eliciting resident knowledge, attitudes/beliefs, and self-efficacy related to firearm safety and counseling, followed by six firearm safety video modules (*Epidemiology, Legislation, Safe Storage, Counseling, Medical Documentation, and Advocacy*) that residents view at their own pace. The curriculum concludes with a post-test that residents take immediately following completion of the final video module. Residents will complete follow-up surveys at 3- and 6-months after curriculum completion to assess retention of educational content and associated changes in clinical practice.

**Results:** A small cohort of pediatric residents (n=7) has completed the curriculum thus far. Prior to curriculum exposure, all (100%) of residents believed that firearm injuries pose a significant safety threat to children, and that these injuries can be prevented. All residents agreed or strongly agreed that pediatricians should routinely ask children and families about the presence of firearms in the home. A lack of confidence and time were identified as the biggest barriers to asking about firearms in the home. Preliminary data suggest that the online curriculum has had the largest impact on perceived resident self-efficacy. Prior to curriculum exposure, 43% of residents felt very or extremely sure about their ability to change patient behavior through counseling compared to 100% following curriculum completion. Only 57% of residents felt confident in their ability to counsel youth and parents on firearm safety pre-curriculum; 100% of residents felt confident post-curriculum. A majority of residents (86%) felt very or extremely confident in their ability to describe safe storage options, and felt they had ready access to information on firearm safety post-curriculum compared with 28% and 43% of residents, respectively, pre-curriculum. Most residents (86%) rated the curriculum as “excellent,” with 71% of residents strongly agreeing that they are now more likely to ask families about the presence of firearms in the home. Qualitative feedback has been favorable; residents have indicated that video demonstration of safe storage options and clinical counseling scenarios has been effective.

**Lessons Learned:** Web-based, self-directed learning is an effective way of educating residents. U of M has great free resources to support video production of educational curriculum for educators who are novice video producers. We used the GroundWorks Media Lab in the Duderstat Center to record 4 of the 6 modules and elicited the expertise from the MSIS Instructional Design and Technology Team. Learning to use existing, free resources for development of web-based modules ensures sustainability of the curriculum moving forward at low cost. Collaboration with faculty from the Departments of Pediatrics and Emergency Medicine added significant value and depth to the content delivered, yielding a more universally relatable curriculum. Independent production allowed for more control of graphic design and visual content.

**Future Applications and Next Steps:** We plan to publish our curriculum and share it within our institution and nationally as part of a massive open online curriculum. We will continue to study the effect of this curriculum on resident knowledge, attitudes/beliefs and self-efficacy with respect to firearm safety counseling. We will also study the influence our curriculum



has on pediatric resident documentation about conversations surrounding firearm safety and safe storage in the medical record and will elicit feedback from families about how this counseling impacts their behavior.

## **Doctors of Tomorrow: A medical student-led pipeline program to increase underrepresented minorities in medicine**

Zahn, K, BS; Derck, J, BS; Mand, S, BS; Finks, J, MD;  
Sandhu, G, PhD;

**Background:** The pool of underrepresented minority (URM) students in medicine is often limited early on by inequalities in primary and secondary education. Growing evidence advances the need to initiate collaborations with K-12 schools in order to attract URM. A team of UMMS students and faculty developed Doctors of Tomorrow (DOT), a partnership with Cass Technical High School in Detroit, to stimulate minority students' interest in medicine. Programming includes hands-on experiential learning, medical student mentorship, and development of a capstone project. DOT differs from many existing high school outreach programs in its longitudinal educational relationship and medical student leadership that drives the sustainability and relevancy of programming. Our project sought to evaluate the impact of current programming to inform further curriculum.

**Actions, Methods, or Intervention:** All 2012-14 DOT students were invited to participate in the feedback process, of which 30 (71%) did. Feedback was collected through focus groups, followed by a written narrative, and then individual interviews that were framed by the narrated experience. Transcriptions of all three feedback methods were thematically analyzed and coded using QSR NVivo10.

**Results:** Two themes emerged from analysis: (1) personal identity had a perceived influence on student achievement; and (2) direct mentorship from medical students and engagement with current healthcare providers were critical and transformative for students. Students readily identified race, socioeconomic status, and education level of family members as motivators but also challenges to their educational goals. Individual mentorship signaled to URM students that others outside their community were invested in their success and offered a near-peer guide with whom they found shared identities. As well, opportunities to work with doctors altered their preconceived notions of doctoring and heightened their confidence to pursue medicine.

**Lessons Learned:** A one-year curriculum, which provides hands-on, context-specific learning, interactions with physicians, and mentoring by medical students was transformative for participating students. In particular, relationships with faculty and medical students had a lasting impact on URM students' beliefs and attitudes. A medical student-led, action-oriented pipeline program has demonstrated success with inspiring and supporting URM students interested in medicine and serves as a complementary approach to other institutional initiatives aimed at increasing diversity in the health professions.

**Future Applications and Next Steps:** Expanding programming for 10<sup>th</sup>-12<sup>th</sup> grade that builds on the strengths of the existing curriculum and aligns with the specific needs of each year could maintain longitudinal engagement of students. Disseminating our model to include nursing and physician assistants can support URM students interested in other health professions and facilitate collaboration among practitioners. Exploring the effect of DOT on medical student mentors will strengthen the capacity of the mentorship component of DOT; support mentors in their role in DOT which carries through into clinical years; and inform development of a mentorship curriculum in other health professions.

## **Benefits and Challenges of Global Teaching Using Videoconferences**

Ehsan Nasr Azadani DDS; Anna Lefkelidou, BDS; Li Zheng BDS, PhD; Nikos Kotsanos BDS, MS, PhD; Petros Papagerakis BDS, MS, PhD

### **Background:**

This study's aim was to evaluate novel methods of teaching a graduate course at the School of Dentistry, University of Michigan (UM). Dr. Papagerakis directs the graduate course (596) entitled Etiologies and Management of Congenital Defects of the Craniofacial Complex, which is offered to the Pediatric Dentistry Residents (6/year). For this course the residents present clinical cases with a focus on the diagnosis and treatment options for each case and support their decisions based on evidence found in the literature. To improve the assimilation of the material through discussion and promote the exchange of ideas in terms of treatment options we have initiated a series of collaborative videoconference teaching between the University of Michigan and other schools worldwide. Our hypothesis is that by connecting the UM class to similar classes worldwide we will greatly enrich the experience of our graduate students (residents). Another advantage of integrating videoconference teaching into the curriculum is to learn sharing ideas with different health professionals at different schools worldwide. Our hope is that this initial exchange may also result in more concrete educational and research collaborations.

### **Actions, Methods, or Intervention:**

We organized two initial series of videoconference teaching (winter and spring semesters of 2015) with the Aristotle University of Thessaloniki, Greece using Umich Bluejeans. Each school presented several clinical cases and proposed several possible diagnoses and treatment plans. Then discussion was held in terms of differential diagnosis and alternative treatment options. The videoconferences were recorded and analyzed afterwards. Evaluation was also achieved by a simple questionnaire offered to our residents and to the residents of the participant other University.

### **Results:**

Significant more discussion was generated during the case presentations through videoconferences when compared to previous years' seminars. The majority of the students (58.3%) liked better the videoconference teaching than the traditional classroom seminars. Although the majority of residents found this learning experience helpful a difference was noted between the opinions of US dental residents versus Greek dental residents. The number of US residents who found this experience better than traditional teaching method was 2 out of 6 (33.3%) versus the Greek residents that 5 out of 6 of them (83.3%) found this experience better than the traditional teaching method. None of the residents found this learning experience worse than their routine seminars.

**Future Applications and Next Steps:**

Several positive and constructive comments were received by the surveys in an open ended question at the end of the survey and it will be used to improve the experience of the students in the future. Two collaborations were also initiated which was one of the positive outcomes of this experience. We envision continuing this effort by connecting 2-3 additional programs from other Universities. This may also result in the creation of a collaborative reposition of clinical cases in Pediatric Dentistry with common participation of all involved Departments/Universities. This can be in form of a website with limited or open access and having open forums for additional on line discussion. Participation of additional specialties such as Pediatrics and Nursing is also envisioned.

Acknowledgments: We would like to thank the UM and UA Dental Schools IT offices and all residents and faculty. This work was supported by a CRLT Faculty Development fund (#421686) and a UM Global Teaching with Videoconferencing grant (#196796) to PP.

## **Cognitive Apprenticeship: A Roadmap to Improve Clinical Teaching**

Michelle Daniel, MD, Steven Rougas, MD, Sarita Warriar, MD,  
Rachel Fowler, MD, Katherine Farmer, MD, Brian Clyne, MD

### **Background:**

Cognitive apprenticeship (CA) is a theoretical framework shown to improve clinical teaching in different practice environments with learners at various levels. CA is based on the premise that effective teaching requires internal expert cognitive processes to be made explicit. This is accomplished through six teaching methods: modeling, coaching, scaffolding, articulation, reflection, and exploration. Many clinical faculty are unfamiliar with the CA framework, but may recognize components of it within their teaching. Faculty development workshops may be an effective means to teach and practice CA, to augment clinical teaching.

### **Methods:**

90-minute faculty development workshops on CA were presented at local and regional medical education conferences. Each workshop began with a brief overview of CA theory, including a review of the six principal teaching. Participants were asked to take a CA self-assessment using a validated instrument to reflect on their current teaching style. Participants then self-selected into small groups according to preferred learner level (pre-clerkship, clerkship, or resident) where they were asked to apply the CA model to improve clinical teaching using case vignettes. Facilitators used an answer key to help guide discussion, reinforcing how the CA model can inform and enhance clinical teaching. Small groups then reported out solutions and take-home points from their discussions to all participants. Finally, participants were encouraged to make a commitment to change by listing how they would apply the CA framework to their own teaching in the future.

### **Results:**

60 participants attended the workshops. Evaluations on a scale from poor to excellent were uniformly excellent for quality of handouts, summarizing key points, active learning and audience participation, and ability to respond to questions. The session was rated good to excellent in terms of the quality of the background information, clearly presented goals, organization of activities and easy to read visuals. There was general recognition among participants that the CA model was a useful framework for clinical teaching: "I think the review and explanation of the various teaching methods was really helpful. I think it provided a good framework to critically look at various methods of teaching and could be implemented on an individual basis."

### **Conclusions / Future Directions:**

Faculty development workshops on CA are a feasible, practical method to promote and apply this important clinical teaching model. A modified version of this FD workshop will be presented for Doctoring faculty targeted at teaching 1<sup>st</sup> and 2<sup>nd</sup> year medical students, and may be more broadly offered to the U of M medical community to address varied learner levels in the clinical setting. Realistic, medical specialty-specific case vignettes may increase relevance for participants. Vignettes may also be easily adapted to other health professions. A MedEd Portal submission for the workshop is under review.

## **Pre-matriculation Self-assessment Pilot: Are you ready for this?**

Stalburg CM, MD MA; Yashar BM, MS CGC PhD.; Seasholtz A, PhD; Markovac, J, PhD; Weir S, MA, Patton JE, MD MHI; Chapman C, MA

**Background:** Students entering medical school can have highly variable backgrounds in basic biological science. This variance may place some at an initial disadvantage with the immediate and rigorous focus on cellular and molecular biological principles considered pre-requisite. Incoming students at the University of Michigan Medical School were routinely provided with a list of topics and textbook resources to help guide their expected biological chemistry and genetics knowledge base upon entry into Medical School. However, there was no opportunity for students to self-assess their baseline knowledge, identify gaps and correct as needed. Therefore, we developed an asynchronous, on-line, formative intervention titled the Online Pre-matriculation Self-assessment Program. The program allows learners to view a list of learning objectives, take a pre and post-test, identify areas for additional study/review, and receive links to additional online foundational resources for five topic areas to enhance their readiness for medical school classes.

**Methods:** In partnership with colleagues with experience in publishing, on-line curriculum design, and learning analytics, two course content experts who teach in the first course of medical school (Foundations of Molecular Medicine) defined the intended learning outcomes for five modules focused on: 1) DNA, RNA, and central tenets of molecular biology, 2) genetics or chromosomal basis of heredity, 3) cell biology, 4) amino acids and protein structure and function, and 5) basics of metabolism. Open educational resources (OER) and relevant licensed teaching materials, such as links to texts or articles and multiple choice test questions, were collected and catalogued. The content experts then reviewed all material for appropriateness and accuracy and selected content as well as questions for pre- and post-testing within each module. The material selected was chosen to correlate with expected base-line knowledge for entering medical students. In addition, each course content expert recorded welcome videos describing the course and how to best access the content. Canvas, a robust learning management system, was then populated and sequenced to require that learners take a pre-test (ranging from 4 to 13 questions) prior to engaging with the educational materials. For each content area, upon submission of the pre-test, students were able to see specific learning objectives as well as targeted open-source and institutionally available learning resources links, providing the ability to seek out additional knowledge. Students were then presented with a post-test (ranging from 4 to 12 questions). The assessment was delivered to students on Canvas over a 2-month period, inclusive of the two-week medical school orientation immediately prior to the start of classes. Participation was voluntary and individuals could complete 1 to 5 modules in any sequence. They could also freely enter the site and utilize the material more than once.

**Results:** Preliminary results indicate that 8 of 170 students did not engage in any of the modules while 68% of matriculating students (116 of 170) completed all five pre-tests and post-tests. Further analysis below is limited to this group.

<b>Module</b>	<b>Pre-post test improvement</b>
DNA/RNA/central tenets	+6.2%
Genetics or chromosomal basis of heredity	+7.24%
Cell biology	+10.84%
Amino Acids/proteins	+0.34%
Basics of metabolism	-34.05%

Overall, this group of students demonstrated improved scores within each module, with the exception of the Basics of metabolism module, which had a 34.05% lower post-test average. This may be a function of the limitations within the module as this was only a 4 question post-test (small sample size) and the post-test questions were more difficult than the pre-test questions. The entire online prematriculation program had a slightly higher overall post-test average than pre-test average (1.1 percentage points higher). Excluding the Basics of metabolism module for the 116 who completed the entire assessment – the total of four subscores was 82.83 pre-test compared with 88.03 post-test – indicating a gain of 5.2 percentage points overall.

**Future Applications and Next Steps:** Overall participation in and complete engagement with the pre-matriculation program was high, with 68% of the Fall 2015 matriculating medical students completing all five modules. With the exclusion of the Basics of metabolism module, students who engaged in the four other modules demonstrated a combined 5.2% pre-post test improvement, suggesting a useful intervention. The initial pre-test subscore of 82.83% also suggests a well-prepared cohort. Continuing analysis will focus on (1) individual question performance (2) analytics regarding the time that students spent on the pre- and post-tests, (3) analytics on the type and frequency of resources used by students, and (4) student satisfaction and seriousness of use of the assessment. Additional information will be analyzed to assess whether performance in the pre-matriculation assessment is predictive of performance on medical school course quizzes and exams.

**Title:** Early Professionalism Education: A Novel 1- Hour Workshop for First-Year Medical Students

Strobel, R, BSChem; Antunez, A, BA; De La Rosa, K, BA; Griffith, M, BA; Hartley, S, MD; Stojan, J, MD; Burrows, H, MD, PhD

**Background and Objectives:** Professionalism is a core competency of medical education, impacts patient satisfaction, and plays an important role in generating rapport with patients. It is also a determinant of trainee wellbeing. Unprofessional attitudes among medical students have been associated with higher rates of career dissatisfaction and “burnout”.

As part of curriculum reform at The University of Michigan students will now begin to engage in clinical medicine in their first week of medical school. This engagement heightens the importance of addressing professionalism much earlier in their training. In an effort to help first-year medical students identify and adopt professional behaviors, attitudes and characteristics we developed a 1-hour workshop on medical professionalism.

**Methods:** The incoming first year medical student class participated in a professionalism workshop on August 13<sup>th</sup>, 2015. The class was divided into groups of twelve, each led by a fourth-year medical student facilitator. A case-based format was selected. Content was informed via medical student input and discussion with key Doctoring Course faculty. The four topics presented included 1. Public disclosure of confidential patient information, 2. Communicating inexperience and trainee status, 3. Professional use of “down time”, and 4. Timeliness and appearance. Fourth year medical students were recruited to facilitate the session in order to create an environment conducive to candid discussion and to provide first year students with a near-peer’s perspective on professionalism. These facilitators were oriented to their role and the workshop’s objectives via a 30 minute orientation session one week prior to the workshop. A pre and post survey was conducted of the first year medical students to assess the workshop’s impact on their understanding of professionalism.

**Results:** 151 first-year medical students completed the pre-session survey and 131 first-year medical students completed the post-session survey. Using a Likert scale the impact of the workshop on student understanding of professionalism was assessed (Table 1). Prior to the session the three lowest rated areas of understanding included managing downtime in clinic, addressing colleagues discussing sensitive patient information in a public space and communicating to faculty they are uncomfortable with an assigned task. All domains showed improvement in understanding following the session, with the greatest gains in managing downtime and communicating to faculty that they are uncomfortable. The lowest rated area of understanding after the intervention dealt with addressing colleagues who are discussing sensitive patient information in a public space. The post-session survey also included questions regarding confidence in addressing these scenarios. Over 80% of students expressed improved confidence in taking positive action across all four professionalism domains assessed. The greatest confidence correlated with the areas with the greatest rated increase in understanding, including use of downtime and conversations with faculty (Table 2).



**Lessons Learned:** Medical professionalism remains an important topic in medical student training. Our workshop demonstrates that a case-based, near-peer facilitated session improves first-year medical student knowledge and confidence in key areas, including public disclosure of confidential patient information, communicating inexperience and trainee status, professional use of “down time”, and timeliness and appearance. This session also helps to inform areas for continued development of understanding including addressing peers discussing sensitive patient information and confidence in “professional dress”.

**Future Applications and Next Steps:** First-year medical students identify key behaviors, attitudes and characteristics of medical professionalism in a small-group, case-based workshop. Pre- and post-survey results demonstrate the effectiveness of this M4-led format, and will be utilized to inform future professionalism sessions. Additional areas of focus in the future may be expanded to include the themes of social media, electronic communication, and team dynamics.

Table 1. Pre- and post-session survey of students’ understanding of medical professionalism

Statement	Pre-Survey Mean <sup>1</sup>	Post-Survey Mean <sup>1</sup>	Δ in Mean (Post-Pre)
I believe it is my role to address concerns about patient confidentiality if one of my colleagues is discussing sensitive patient information in a public space.	4.66	4.71	0.05
I would feel comfortable addressing a colleague who was discussing sensitive patient information in a public space.	3.74	4.17	0.43
It is my responsibility to speak up when I don't feel comfortable performing a task assigned to me by faculty or staff.	4.35	4.72	0.37
I would feel comfortable sharing my concerns when asked to do something I am not adequately trained to do by faculty or staff.	3.86	4.52	0.66
I would feel comfortable introducing myself as a medical student to patients.	4.70	4.75	0.05
I would feel comfortable managing downtime in clinic.	3.68	4.45	0.77
Appearance and timeliness are important components of medical professionalism.	4.71	4.87	0.16
I understand what is meant by "professional dress" for a medical student.	4.23	4.75	0.52

<sup>1</sup>Mean of Likert scale results where 5 - strongly agree, 4 - agree, 3 - neither agree nor disagree, 2 – disagree, and 1 - strongly disagree

Table 2. Post-session survey items assessing student confidence within specific professionalism domains

“This session improved my ability to...”	Strongly Agree/Agree (N)	Neither Agree nor Disagree (N)	Disagree/Strongly Disagree (N)
Maintain patient confidentiality	83% (103)	15% (19)	2% (2)
Communicate my status/experience as a medical student	87% (109)	10% (13)	3% (3)
Appropriately utilize downtime	92% (115)	7% (9)	1% (1)
Dress professionally	80% (99)	17% (21)	3% (4)

## Breast Density Legislation Enacted in Michigan: Addressing the Need for Provider Education (MIDenseBreasts.org)

Stalburg CM, MD, MA; Pinsky RW, MD, Rebeau J, MA; Helvie, M, MD; and Lee CT, MD

**Background:** Breast cancer remains the most common cancer in women, and although screening mammography reduces breast cancer mortality rates among women 40 to 74 years of age, mammography has a 10-20% reduced sensitivity to detect malignancies of the breast in women with dense breast tissue.<sup>1,2,3</sup> In addition, women with dense breasts may have a 1.2-2.1 times greater risk of developing breast tumors than women with average breast density.<sup>4,5</sup> Recently, several state governments (24 to date) have passed legislation to ensure that patients receive notification of breast density. In Michigan, the Breast Density Notification Law went into effect on June 1, 2015. This legislation requires radiologists to notify a woman and her provider if she has heterogeneously or extremely dense breast tissue identified on screening mammography. The law states that the woman should seek counsel from her provider about the potential need for additional imaging based on her breast density and overall breast cancer risk. In order to comply with this legislation, it will be crucial for Michigan primary care providers (PCPs) to be familiar with the clinical and genetic factors that determine a woman's breast cancer risk and whether the degree of risk warrants supplemental imaging to complete adequate screening.

**Intervention:** We designed, developed, and produced modular, interactive, online educational content familiarizing Michigan based PCPs with the Breast Density Notification Law and the updated screening guidelines created by the Michigan Cancer Consortium. The website, **MIDenseBreasts.org**, using a combination of short videos, pre and post-tests, and links to additional resources, reinforces breast cancer screening, assists PCPs in determining a woman's overall breast cancer risk, and outlines recommendations for supplemental breast imaging for women with heterogeneously or extremely dense breasts detected on mammography. The educational activity is brief and modular in design, encouraging point of care learning, and complies with requirements of the Accreditation Council of Continuing Medical Education (ACCME) such that American Medical Association (AMA) Physician's Recognition Award (PRA) Category I credit will be issued for participation. The project also provides a mechanism to integrate these tools into clinical practice.

**Results:** In the first six weeks that MIDenseBreasts.org has been live, the website has been accessed 2,245 times by 1,946 unique users who viewed 4,446 pages. Sixty-eight CME certificates were issued to 16 different individuals; 56% of those individuals completed all of the modules. All participants claimed the maximum number of CME credits per module. The table summarizes participant viewing of the educational videos.

Video Name	Number of Views
Module 1: Breast Density on Mammography	105
Module 2: Supplemental Breast Cancer Screening	101
Module 3: Recommendations for Patients With Dense Breasts	86

Module 4: Agreement Over Screening	58
Module 5: Controversies in Screening	47
Module 6: Negative Consequences of Screening	53

**Lessons Learned:** Strategies employed in the creation of massive open online courses can be applied to the delivery of on-line educational modules for CME. Policy change served as the driver for a novel intervention intended to provide accessible point-of-care information to providers, statewide. Initial engagement with the site has been promising. Publicity and continued dissemination of the information will be important to support providers as they adapt their workflow in response to new legislation.

**Future Applications and Next Steps:** The effectiveness of the educational modules will be measured by: 1) the number and location of providers reached; 2) participant time devoted to modular learning; 3) analysis of pre- and post- modular testing; and 4) the number of resource views and downloads.

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Disclosure: This work is supported in part by the Centers for Disease Control and Prevention (CDC) Cooperative Agreement 3U58DP003921 in partnership with the Michigan Department of Health and Human Services

Acknowledgement: The authors would like to thank Allen Flynn, PharmD for exploratory efforts to establish a health information exchange for mammography results within the State of Michigan.

## University of Michigan nursing – Healthcare and Integrated Learning (UM-HAIL)

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**Acknowledgements:** EM-PACE Seed Grant Recipient 2014 (Co-PIs: M. L. Munro, S. A. Bell, & J. R. Lori)

**Background:** Ethiopia is the second most populated African nation and suffers from high rates of maternal (676/100,000) and infant (59/1,000) mortality.<sup>1</sup> According to the 2011 Demographic and Health Survey, only 24% of children in Ethiopia age 12-23 months were fully vaccinated.<sup>1</sup> One of Ethiopia's main health issues, communicable diseases, is worsened by malnutrition and poor sanitation. These health problems are exacerbated by a shortage of trained healthcare providers (including physicians, midwives, and nurses), as well as a shortage of health facilities. In 2009, there were 20,109 nurses and 1,379 midwives in Ethiopia which translates into a ratio of 0.28 nurses and midwives per 1,000 people,<sup>3</sup> while the World Health Organization (WHO) recommended density is 1.73.<sup>4</sup> A large scale-up of nurses and midwives by the Ministry of Health has resulted in a much larger nursing and midwifery workforce to address the burden of disease in Ethiopia. However, this quick scale-up calls into question the need to understand the quality of performance of now-practicing nurses and midwives in relation to patient health outcomes. Additionally, recent Ministry of Health calls for improved interdisciplinary team collaboration are reliant on the quality of nursing and midwifery practice as well as leadership skills and training for nurses and midwives.<sup>5</sup>

**Actions, Methods, or Intervention:** The purpose of this project was to explore the establishment of a nursing and midwifery center of excellence in partnership with Aksum University. Our goals were to facilitate student and faculty exchange, establish shared virtual learning experiences, and immerse University of Michigan (UM) nursing students in a global clinical and research environment.

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**Results:** Two UM nursing faculty traveled to Aksum University in Ethiopia in October 2014 to conduct a needs assessment and explore potential collaborations with the College of Health Sciences. A fruitful relationship was established with the Dean of the College of Health Sciences as well as the nursing and midwifery faculty. Two UM nursing faculty returned to Aksum University in January 2015 to expand established partnerships with faculty from the College of Health Sciences and to discuss the potential for video conferencing and student and faculty exchanges. Shortly after the trip a Memorandum of Understanding was signed by the UM School of Nursing and the Aksum University College of Health Sciences. Additionally, we have had monthly video conferencing sessions using the BlueJeans platform to establish a sound connection and share assignments for future student video conferencing experiences. Finally, an Aksum University nursing instructor will be visiting the University of Michigan for 10 days in October to learn more about leadership, interdisciplinary collaboration, and technology based learning.

**Lessons Learned:** Although this interdisciplinary collaboration with Aksum University College of Health Sciences has been fruitful, it has not been without its challenges. First, a significant time difference (7 hours) between Aksum, Ethiopia and Ann Arbor, Michigan has made communication, especially video conferencing, difficult. Furthermore, while the faculty at Aksum University are committed to a partnership and the potential for video conferencing and joint assignments among nursing classes in each country the technology capability in Aksum has presented real challenges.

**Future Applications and Next Steps:** We will continue to work with our colleagues at Aksum University as well as the UM Language Resource Center to implement shared virtual learning experiences. We will continue to seek funding and opportunities to promote student and faculty exchange.

TITLE: Evaluation of a Self-Directed, Simulation-based Learning Program

AUTHORS: Deborah Rooney PhD, Suzanne Dooley-Hash MD, Meg Dobson MD, James Cooke MD

### **Background:**

Repetitive practice with feedback is a critical component of clinical skills training, yet many institutions are faced with limited faculty time available to facilitate practice. We propose a novel simulation-based, self-directed learning modality that offers learners opportunities for content delivery, independent skills practice, competency-based assessment and opportunity for independent skill refresher and/or remediation. Evaluation of content quality and attitudes toward the new learning modality is required prior to implementation.

### **Methods:**

In a feasibility study targeting fifteen learners (10 medical students and 5 residents) and two faculty from Family and Emergency Medicine, we developed three modules [lumbar puncture (LP), cardiopulmonary (CP) examination, and retinal examination] using Canvas, the new cloud-based learning management system. Each module included an overview, a set-up guide, review materials, a demonstration video, and pre-and post-module assessments (cognitive and psychomotor). Prior to being introduced to the online modules, participants completed selected items from a previously-validated online learning readiness scale (OLRS, Hung 2010), an instrument intended to measure adult learners' willingness for, and comfort toward, self-directed online learning. As part of scheduled simulation-based training sessions, participants were introduced to the interface, and asked to complete the modules at their own pace. All participants evaluated the modules' content for information-content, access, organization, set-up directions and demonstration, and ease of use using a 32-item survey scored on 3-point rating scales, (1=Inadequate-improvements required, 3=Perfect as is-no improvements required). Learner and faculty rating differences were analyzed using Kruskal-Wallis test, with statistical significance  $p < 0.05$ .

### **Results:**

Findings indicate that all 15 learner participants had "high" willingness and comfort with online learning, with OLRS grand mean scores for medical students and residents of 56 ( $SD=9.3$ ), and 60 ( $SD=4.3$ ) out of 75 possible points, respectively. The two faculty estimates of learners' online learning readiness was higher [66 ( $SD=1.2$ )], but not significantly different,  $p > .05$ .

Modules' average ratings ranged from 2.4 to 2.7, with and Overall-Global ratings of 2.76,  $SD=0.56$ , aligning with "Perfect as is-no improvements required." Lowest rated content was associated with the retinal exam module. Suggestions for overall improvements included "better feedback on quiz items" and improved navigation options.

### **Lessons Learned**

Self-directed learning via a web-based platform coupled with on-demand access to simulation-based skills development and assessment offers a very well accepted learner-centered experience that has significant potential for improved pre-clinical skills training, objective assessment data, and educational efficiency due to decreased need for faculty for

instruction and assessment. Medical students indicate they would readily find the time to practice these skills, while residents may require protected time due to competing clinical and other educational obligations.

**Next Steps:**

Revisions to existing modules are planned and evaluation is on-going. Additional modules targeting pediatric care will also be developed.



## **The Michigan Journal of Medicine: a Practical Pilot for the New Medical School Curriculum**

Rebecca Welzenbach, MSI  
Shannon Cramm, Medical Student (M4)  
Sagar Deshpande, Medical Student (M3)  
Spencer Lewis, Medical Student (M3)  
Michael Englesbe, MD  
Jasna Markovac, PhD  
John Magee, MD

### **Background:**

In light of planned revisions to the University of Michigan Medical School curriculum, which will include extensive new elective offerings for third and fourth year medical students, the Department of Surgery is taking an active role in expanding elective offerings, with the aim of cultivating physician-scientists, by establishing the [Michigan Journal of Medicine](#). This journal aims to reward student efforts with publication, to broaden access to their discoveries, and to teach students how to critically appraise novel scientific research. While initially serving the medical school, this publication will be ultimately be open to submissions from all members of the larger University of Michigan community.

### **Actions, Methods, or Intervention:**

The Medical School and Michigan Publishing, a division of the University of Michigan Library, are collaborating to produce and publish the *Michigan Journal of Medicine*. The student senior editors (all M4s) are enrolled in a yearlong credit-based elective, Medical Editing (2MEDE.U), throughout which they will gain experience with all aspects of medical publishing, from contracts and copyright to peer review. Parallel to their coursework, the editors will recruit, review, and accept submissions for the first issue of the journal, scheduled to publish in May, 2016. Michigan Publishing will work with the students throughout the year to plan and execute the first issue, and will also serve as the host for this open-access, online journal.

### **Results:**

The Call for Papers was just announced August 10, 2015, so results for the first issue of the journal remain to be seen. The Medical Editing course for M4s has had several class meetings thus far, each touching on a different aspect of the scholarly communications lifecycle. For students in the course, this elective will continue to give them broad exposure to leaders in the field of medical research, editing, and publishing while teaching these important skills through hands on work with real scientific submissions from their peers. More broadly, this journal has already provided opportunity to establish new working relationships between the Medical School, the University Library system, and Michigan Publishing. The Journal concept has been recognized by the University's Third Century Initiative with a "Quick Wins" grant.

### **Lessons Learned:**

The development of *MJM* as a concept and then as an actual journal has allowed the students to learn about the processes of scientific and medical publishing. Over the next year, they will gain an understanding of the role of an academic in medical publishing. Students will learn how to prepare manuscripts and be effective reviewers, and will ultimately become better scientific communicators. In addition, they will develop leadership skills to effectively manage a medical journal. These skills will be essential as they build successful careers in academic medicine.

**Future Applications and Next Steps:**

The Call for Papers is now open. Through the end of the calendar year, the student editors will be reviewing and selecting submissions. Early in 2016, Michigan Publishing will begin work on production. The first issue of the Michigan Journal of Medicine will be published in May 2016. We anticipate that in future years the schedule may be increased to publish two or up to four issues per year.

**Health Professions Education Day – Abstract Example from 2014**  
<http://dlhs-umi.ch/mededday2014program>

**Enhancing the Catalytic Educational Effect of Summative Assessments: Use of Skill-Domain Scoring and Feedback for an M4 Objective Structured Clinical Examination**

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**BACKGROUND AND OBJECTIVES**

Summative OSCEs often inadequately produce “catalytic educational effects”, whereby “assessment provides results and feedback in a fashion that creates, enhances, and supports education [and drives] future learning forward” (Norcini et.al. 2011). This project describes our recent utilization of skill-domain scoring/feedback intended to enhance catalytic educational effects of our M4 OSCE.

**METHODS**

We provide OSCE scoring/feedback at the individual-station level, and the overall-exam level. Beginning with the 2012-13 M4 cohort (n=171), we calculated new skill domain scores to provide additional scoring/feedback: Data-Gathering, tabulated from History/Physical Examination checklists across seven stations; Communication, from six station checklists; and Clinical-Reasoning, from five post-encounter notes and assessments, an oral case presentation, and written evidence-based medicine and critical values exams.

**RESULTS**

Across domains, Mean(SD) were similar. Data-Gathering: 83%(5%); Communication: 82%(8%); Clinical-Reasoning: 83%(5%). All inter-domain correlations were significant (p<0.01). Communication yielded weak inter-domain correlations with Clinical-Reasoning (r=0.25) and Data-Gathering (r=0.22); Data-Gathering and Clinical-Reasoning were moderately correlated (r=0.45); OSCE-Overall had the strongest correlation with Clinical-Reasoning (r=0.87). Students  $\geq 2$ SD below average on Communication scored variously on the OSCE-Overall: some poorly, others well. In contrast, students with low Clinical-Reasoning scores fell in the bottom quartile on OSCE-Overall.

**LESSONS AND CONCLUSIONS**

Adding domain-specific scoring to our OSCE identified needs for communication and clinical-reasoning curricular enhancements. It also improved remediation for students with domain-related performance patterns. Some who did well on the OSCE overall learned Communication improvements were still warranted; patterns for students with poor Clinical-Reasoning scores revealed some needed data-gathering improvements, while others could data-gather but needed to improve synthesis. Domain-specific scoring/feedback expanded catalytic educational effects of our OSCE, by identifying

areas for curricular enhancement, and improving feedback and remediation for students.

**TITLE:** A Two-Way Path Toward Effective Communication in the PICU: Evaluation of a Novel Program

**AUTHORS:** Deborah M Rooney PhD, Kori L Jones MEd, Timothy T Cornell, MD

**Background:**

Effective communication with patients and parents improves satisfaction and reduces healthcare costs. Few graduate medical training programs offer formal communication training. The simulation-based “Communication Bootcamp” offers a novel learning opportunity for both fellows and parents, while creating a care team that employs effective two-way communication. We describe the curriculum, associated assessment, and early program evaluation findings.

**Methods:**

The program transformed into a 2-day, informal, authentic, two-way discussion among parents and fellows in the Pediatric Intensive Care Unit (PICU). On-going formative assessment was performed to measure 8 fellows’ bedside communication skills. Three parallel forms, targeted to the fellow, parent/caregiver, and other healthcare providers consisted of 5 items scored on 4-point scales ranging from 0 (Unacceptable) to 3 (Above expectations) to evaluate different aspects of care (engagement, respect, Information, responsibility, hope). From July 2014-March 2015, 92 patient interactions were assessed with these measures. Responses by role were compared using Kruskal-Wallis test, and trends over time were analyzed using a Rasch model.

**Results:**

Healthcare providers’ [Observed Avg (OA) = 2.8] and parents/caregivers’ ratings (OA=2.6) were higher than fellows’ (OA=1.8) across all aspects,  $p < 0.5$ . Trends indicated improvement across all aspects over time, but statistical significance was not reached. Evaluation is on-going and updated results will be presented.

**Lessons Learned:**

Preliminary findings suggest the “Communication Bootcamp” improves PICU fellows’ communication with patients and their parent/caregivers.

**Next Steps**

Future work includes analyses of fellows’ reflective notes, and evaluation of patients’/families’ attitudes toward the program.

## ASSESSING THE DIAGNOSTIC AND THERAPEUTIC COMPONENTS OF CLINICAL REASONING

Larry D. Gruppen, PhD  
Jennifer Stojan, MD

**Background:** Clinical reasoning, a complex cognitive task, integrates diagnostic and therapeutic decision making. This study explores how medical students integrate baseline diagnostic probabilities with new test information to revise therapeutic decisions.

**Actions, Methods, or Intervention:** 171 students were given a case of a woman with a 20% probability of a mixed viral/ bacterial infection. They were asked to indicate whether they would treat with antibiotics, not treat, or order additional testing to determine treatment. Students were then told that additional testing was performed, with half given a positive result and half a negative result. They were instructed to calculate how the result changed the probability of a mixed infection and make a final treatment decision based on the new result.

**Results:** Based on a 20% probability, 12.3% of students wanted to treat, 17.5% did not and 66.1% wanted additional testing. Of the students given a positive test result, 64% decided to treat, 3% decided not to, and 32% wanted additional testing. After a negative test result, 63% decided not to treat, 7% decided to treat and 29% wanted additional testing.

**Lessons Learned:** Students may be accurate in their interpretation and use of diagnostic information but still vary in therapeutic decisions because of individual differences in treatment threshold probabilities. Such thresholds are likely to be quite fluid at this training stage, but little is known about how these thresholds evolve with education or experience.

**Future Applications and Next Steps:** Effective clinical reasoning is made up of multiple sub-skills, each of which needs to be assessed to identify reasoning problems in learners.

## Evaluation of performance measures from two instruments used to assess robotic prostatectomy among fully trained surgeons

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### INTRODUCTION

With the purpose of improving robot-assisted radical prostatectomy (RARP) outcomes, the Michigan Urological Surgery Improvement Collaborative (MUSIC) performed a pilot study of video-based assessment of the technical quality of RARP among fully trained surgeons with a global and procedure-specific instrument, using peer surgeon reviewers with varying degrees of RARP experience. We evaluated validity evidence based on *Standards for Educational and Psychological Testing* framework, which represents the gold standard in guidance on testing in the United States and many other parts of the world.

### METHODS

12 surgeons in MUSIC submitted a video of a representative nerve-sparing RARP which was edited into 76 video-clips of <10 minutes duration, containing one of four surgical parts: bladder neck, apical dissection, nerve-sparing, and anastomosis. Video-clips were evaluated for global skills using the Global Evaluation and Assessment of Robotic Skills (GEARS) instrument, while 8 performances of the unedited anastomosis were assessed with the Robotic Anastomosis Competency Evaluation (RACE) instrument. In total, 25 MUSIC urologists acted as peer reviewers including 5 high volume surgeons (>1000 cases). We evaluated validity evidence using Rasch models and Wilcoxon rank sums tests to analyze rating differences by reviewer surgical experience level. Intraclass coefficient (ICC) was used to assess inter-rater reliability of scores.

### RESULTS

Examination of rating differences by reviewer experience indicated no differences for any of the six RACE items tested, while for GEARS, *force sensitivity* was rated higher by high volume surgeons compared to other reviewers (Mean=3.98 vs. 3.69;  $p=0.02$ ). Analysis of ratings for the different parts of surgery using GEARS indicated no significant differences ( $p=0.20$ ). Inter-item consistency was high for both instruments (RACE,  $\alpha=0.82$ ; GEARS,  $\alpha=0.89$ ) while Rasch strata indices suggested RACE and GEARS were able to estimate four and seven distinguishable levels of performance, respectively. In spite of this, inter-rater reliability of scores was poor for GEARS (ICC=0.25), with improvement seen when assessing the anastomosis with RACE (ICC=0.55). Kendall's  $\tau$  correlation for the high volume and other reviewers' summed scores for RACE and GEARS were -0.22 ( $p=0.44$ ) and 0.20 ( $p=0.001$ ), respectively.

**LESSONS LEARNED**

Preliminary validity evidence of GEARS and RACE for assessing the technical quality of RARP skills among fully trained surgeons was variable. While evidence of test content and rating scale function was adequate, inconsistent rating across high volume and other reviewers indicated the need for an improved procedure-specific tool for RARP.

**NEXT STEPS**

Future developments include the development of a novel assessment tool to better target procedure-specific RARP skills. Evaluation of relevant validity evidence will follow.



Evidence	Inferences
<b>Response processes</b>	
<p>Category observations</p> <p>Category Average Measures</p> <p>Category Outfit Mean Square (MS)</p> <p>Category Rasch-Andrich thresholds</p> <p>Person Outfit MS</p>	<p>Adequate number of observations in each category must be met to ensure precision.</p> <p>Averages measures should increase with categories to ensure assumption of monotonicity (better performance aligns with higher score) is upheld.</p> <p>Outfit MS indices that fall close to 1.0 (within 0.6-1.5 range) indicate reasonable consistency in ratings for each category.</p> <p>Threshold values that increase and have adequate spread (between .8 and 5.0) suggests raters are using each category as intended, with decisive use between categories, indicating anchors are clearly-written and align with performance being measured.</p> <p>Person Outfit MS indices that fall within <math> \pm 2.0 </math> indicates participants have reasonable amount of variation. Indices over 2.0 may indicate unexpected rare extremes in ratings. More than 5% of participants with extreme outfit may indicate misuse of the instrument, or misalignment in construct being measured.</p>
<b>Test content</b>	
<p>Point-measure correlations</p> <p>Rasch Item Outfit Mean Square (MS)</p>	<p>Positive point measure correlation suggests items of scale align to a common construct.</p> <p>Item Outfit MS index that fall within <math> \pm 2.0 </math> indicates ratings have reasonable amount of variation. In combination, these indices support evidence of unidimensionality, indicating the measures from the instruments are measuring a unified construct.</p>
<b>Internal structure</b>	
<p>Item reliability (internal consistency) estimated by Rasch reliability indices equivalent to Cronbach alpha</p> <p>Rasch person strata index</p> <p>Item bias across different applications (targeted surgical components)</p>	<p>High internal consistency (<math>\geq .80</math>) indicates that, when combined, the items align to measure a single construct.</p> <p>This index indicates the number of levels of examinee performance the tool can statistically distinguish with adequate reliability.</p> <p>Item bias (differential item functioning) indicate if domains (items) are being used differently across application or setting (here, different surgical components). No statistical rating differences suggests the items of the tools are being used similarly across each of the four surgical components.</p>
<b>Relationships to other variables</b>	
<p>Comparison of expert and other GEARS and RACE ratings using a Wilcoxon rank sum test</p> <p>Correlation of summed GEARS and RACE scores using Kendall's <math>\tau</math> correlation</p>	<p>Statistically significant (<math>p \leq 0.5</math>), differences in ratings of "gold-standard" experts (&gt;1000 RARP cases) to other raters (250-1000 cases) may indicate gaps in RARP rating ability or assessment training requirement for less experienced surgeon raters.</p> <p>High, positive correlation indicates there is a good relationship between the measures, and suggests measures are related. Range is -1.0 to 1.0, with perfect correlation being 1.0.</p>

Table 1 – Based on *Standards for Educational and Psychological Testing*, 2014, American Educational Research Association, American Psychological Association & National Council on Measurement in Education: American Educational Research.

**Table 2. Category (Likert number) function indices for RACE and GEARS tools**

Tool	Category Counts		Quality Control		Rasch-Andrich
	Category Score Count	Used (%)	Avg Measures	Outfit MS	Thresholds
RACE	1	4 (2%)	-.21	1.8	-
	2	6 (3%)	-.48*	1.0	-1.00
	3	34 (18%)	.35	.9	-1.77
	4	82 (44%)	1.58	.9	.08
	5	60 (32%)	3.16	.9	2.68
GEARS	1	36 (2%)	-.93	.8	-
	2	110 (6%)	-.06	1.1	-1.55
	3	457 (27%)	.66	1.0	-1.16
	4	554 (32%)	1.44	1.0	.84
	5	563 (33%)	2.37	1.1	1.87

\*indicates disordered categories

Table 3. (Rasch based) Validity evidence relevant to test content and relationship with other variables.

RACE Item	Test Content		Relationship with Other Variables		
	Outfit MS	Point-measure correlation	General Observed Average (SD)	Expert Observed Average (SD)	P-value
1. Needle positioning	0.82	.69	3.96 (1.00)	4.38 (0.52)	0.29
2. Needle entry	0.90	.63	4.15 (0.95)	4.50 (0.53)	0.45
3. Needle driving / tissue trauma	1.04	.69	3.89 (0.89)	4.00 (0.76)	0.80
4. Suture placement	0.76	.73	3.89 (1.05)	4.13 (0.83)	0.69
5. Tissue approximation	1.21	.61	4.33 (1.04)	4.38 (0.52)	0.60
6. Knot tying	1.36	.61	4.15 (1.06)	4.63 (0.52)	0.34
<b>GEARS</b>					
1. Depth perception	0.89	.63	3.99 (0.99)	4.11 (0.90)	0.35
2. Bimanual dexterity	0.84	.65	3.86 (0.91)	4.05 (0.86)	0.07
3. Efficiency	1.22	.64	3.60 (1.16)	3.63 (0.94)	0.96

4. Force sensitivity	1.27	.60	3.69 (1.07)	3.98 (1.03)	0.02
5. Robotic control	0.93	.65	4.03 (0.93)	4.09 (0.91)	0.56

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## **Multisource Assessment Feedback for Reflective Learning in Dental Education**

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### **BACKGROUND AND OBJECTIVES:**

Self-evaluation alone in formative competency assessment has been questioned in the literature as an effective approach to reflective learning. The aim of this study was to measure: 1. inter-rater agreement in multisource assessment of caries excavation, and 2. the validity of using this assessment tool for improving summative assessment performance and self-evaluation in caries excavation on extracted teeth in a first-year undergraduate dental cohort using experts as the golden standard.

### **METHODS:**

Methods used in this study were determined to be exempt under the reference number HUM00087187 by the IRB of the University of Michigan. Data collection took place in a simulated dental facility involving a first-year cohort of 104 students in an undergraduate (DDS) program of the 2013-2014 academic year. Assessment-criteria of caries excavation on extract teeth were identical for both formative and summative assessments and included 1) convenience form 2) caries removal at the DEJ, and 3) caries removal in dentin. All participants in this study underwent the same calibration exercises to prepare them for taking on assessor roles in the multisource assessments. Inter-rater agreement was measured between 3 assessor groups (self-, peer- and expert-assessors) in the formative assessment, and 2 assessor groups (self- and expert-assessors) in the summative assessment for the same cohort of students 3 weeks apart. This allowed for student reflection on independent feedback from each

assessor type. All students being assessed acted as both self- and peer-assessors for each assessment period, allowing self-assessors to also critically evaluate their peers in the same assessment period. After this reflective process, students were asked to produce a self-generated study plan that they could follow for the purpose of personal skill improvement between assessment-periods. Inter-rater agreement was determined through calculation of percentage-agreements in scoring between self- and expert-assessors for both formative and summative assessments. Validity of using the assessment tool to improve summative scores and skill in self-evaluation was determined by measuring significance of positive shifts in assessor-agreement with the McNemar's test. Furthermore, descriptive data was collected to determine any change in grade classification between formative and summative assessments for all assessor groups.

## **RESULTS:**

Students (n=104) improved in their caries removal skills substantially by the end of the course as indicated by their own and the expert assessment scores. Inter-rater agreement between the self- and expert-assessors increased significantly in the global-scoring from the formative to the summative assessment, where a 28% agreement in the formative assessment shifted to a 60% agreement in the summative assessment, showing a 114% percentage-change in agreement between assessment periods. Significance in this percentage shift between assessments was demonstrated with McNemar score of .27 ( $p < .001$ ). Finally, descriptive data determined positive shifts for self- and expert-assessor groups in grading classifications (R=clinically ideal, S=clinically satisfactory, T=clinically acceptable after modification, V=not clinically acceptable and must be repeated) for each grading criteria between assessment-periods.

## **LESSONS LEARNED AND CONCLUSIONS:**

Student self-evaluation moved closer to the expert's golden standard after they were given the opportunity to reflect on independent feedback from 3 assessor types (self,

peer, expert) provided in a formative multisource assessment of caries excavation. Inter-rater agreement showed significant shifts toward improved summative assessment performance in caries excavation for first year undergraduate dental students. Validity of using the formative multisource assessment tool described for the purpose of improving summative assessment performance and self-evaluation in an undergraduate dental cohort was established.

#### **FUTURE APPLICATIONS:**

The information gathered from this project is helpful in expanding implementation of multisource assessment for the purpose of reflective practice in the DDS program here at the University of Michigan, as well as other programs nationally. Future projects that include formative assessment in clinical environments for clinical competency and improvement of self-evaluation and reflection are presently in development.

***A Novel Approach for an Interdisciplinary Simulation- based Medical Emergencies Course for Dental Students . Quantitative and Qualitative Data analysis.***

Marti K, DMD, MD, PhD, Sandhu G ,PhD, Aljadeff L, DDS, Greene R, DDS, Lesch A, DDS , Pinsky HM, DDS, Rooney DM, PhD

**Background:** To improve training of dental students in medical emergencies, we implemented a novel role-playing training program in a simulated setting, at the University of Michigan School of Dentistry. Our aim was to teach second-year students recognition and management of medical emergencies, and assess students' competencies and their attitudes toward the new program.

**Methods:** Following IRB-exempt determination by our institution, we developed an innovative interdisciplinary simulation-based program (role-playing of scenarios) to supplement the lecture-based course on medical emergencies. All second year dental students (D2, n=113) were randomly assigned to groups of 15 students (5 groups of 3 students) and participated a three-hour session during the winter 2014 semester. There were 5 stations (altered consciousness, chest pain, drug related emergencies, loss of consciousness, respiratory emergencies). Each group engaged at each station for 30 minutes. Students rotated through different roles (team leader, member, patient) for each scenario. Faculty members, residents and fourth year dental students voluntarily facilitated this simulation.

Program evaluation (quantitative and qualitative): First, using a pre-post design, all students voluntarily completed anonymous surveys to self-assess their knowledge, experience, and confidence toward performing seven skills required during medical emergencies (access emergency kit, call 911, assemble emergency team, airway management, find/use O<sub>2</sub>, deliver appropriate medications, measure vital signs). Second, to identify learning gaps in the curriculum, a random sample of students (n=51) were assessed on their ability to complete critical actions by peers using a dichotomously-scored, 11-item checklist. Analyses were performed using a many-facet Rasch model, supported by Wilcoxon rank-sum test. Third, students answered 4 open-ended questions following the simulation: 1.How comfortable were you during the actual simulation experience? 2.What specific advice would you give to help your instructor improve your learning in this simulation session? 3. What other ideas would you suggest to improve this course? 4. Do you feel that you need to have more simulation sessions in the future? Qualitative data from free responses in the post-survey were thematically analyzed

**Results:** Following intervention, students' average self-efficacy ratings improved overall [pre-; observed averages (OA) = 3.2, post OA = 3.8, p = .001]. Students' self-reported knowledge ratings improved for all skills (p = 0.001), with the exception of Find/Use O<sub>2</sub>, (p = 0.39). Similarly, students reported statistically significant improvements in experience and in confidence toward each skill (p = 0.001). Post-intervention peer-rated performance indicated that some students continued to have difficulty with four skills: (Calculating Epinephrine dose, EpiPen © use, calculating local anesthetic dose and Inhaler use). Four major qualitative themes emerged: a) students wanted to be introduced to medical emergencies experiences earlier in their dental education and repeated with regular frequency throughout their program, b) limited knowledge of content during the medical emergencies experience may have led to self-described heightened levels of stress among students, c)students provided robust written feedback with practical recommendations for enhancing the quality of the

curriculum, and d) students asked for more concrete educational materials such as videos and handouts.

**Lessons learned:** Results of our controlled randomized study indicate that this novel simulation-based program strongly promoted an increase in students' knowledge, experience and confidence toward managing medical emergencies in a simulated setting. Although students offered suggestions for improvement, the program was well-received.

**Next Steps:** We identified potential outstanding learning gaps that could be better targeted in future versions of this program. "Lessons learned" through the program's development and implementation indicate this is a rich opportunity to include learners from other health fields (e.g. nursing, pharmacy) into the course. This would lend itself well to including faculty members from more health professions. There is increasing evidence that simulation-based learning is especially beneficial to interprofessional education (IPE) activities because of its experiential nature. Learners have also reported high overall satisfaction and strong positive attitudes toward teamwork, collaboration and patient centeredness through participation in simulation-based IPE.



## Strategies for Implementing Evidence-based Practice in an Undergraduate Clinical Course

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Sullivan, Barbara-Jean, PhD, APRN-BC, NP  
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Hagerty, Bonnie M., PhD, RN

**Background and Aims:** The Institute of Medicine and major health care agencies in the United States have described the need for nurses to provide evidence-based care to improve health care quality. Nursing faculty play a critical role in educating students to engage in evidence-based practice (EBP). Yet, it has not been well-explicated in the literature *how* to incorporate EBP in clinical teaching, and further, *how to evaluate* the strategies employed. The study aims were: a) to describe ways in which EBP was incorporated into clinical assignments, and b) to present findings regarding the efficacy of EBP assignments.

**Methods:** This descriptive mixed methods study was conducted during a one semester (two six week sessions) mental health clinical course incorporating 64 students. Eight assignments, including six reflective journals, one process recording, and one group plan and evaluation, were designed to incorporate EBP. The eight assignments were analyzed for number and type of references used. The final reflection assignment was used to uncover themes related to students' engagement in EBP.

**Results:** In both six week sessions, the number of students citing journal articles increased steadily each week, and by week five, 100% of students documented a minimum of one journal article in their reflections. Sixty-two percent of students used at least one article in their process recording, and 90.6% utilized one article in their group/activity paper. Content analysis of the final reflection revealed four themes related to EBP use: a) incentivized (graded) clinical assignments, b) resource use, learning, and professional self-concept, c) applications of mental health nursing concepts, and d) barriers and potential future outcomes.

**Lessons Learned:** When documentation of EBP (as measured by incorporation of recent, high-quality journal articles in written student assignments) is specifically expected by faculty members, is detailed in narrative in the course syllabus, and when grading rubrics are provided, the majority of students will follow through at the outset of the clinical course. Students' ability to use high quality evidence in their written work improves as they are exposed to more theoretical content during the course of the term, and as they receive specific feedback from their clinical faculty members.

**Future Applications and Next Steps:** An introduction to the importance of EBP needs to take place in the freshman year of study, and EBP must be incorporated in all clinical courses throughout the students' tenure in school, such that they feel comfortable in locating relevant evidence to address clinical situations and apply this evidence to their practice.

## **Improvement in acute care surgery medical student education and clerkships: use of feedback and loop closure.**

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**Background:** The unpredictable and sometimes chaotic environment present in an Acute Care Surgery Services (Trauma, Burn, Surgical Critical Care, Non-Trauma Emergency Surgery) can cause high levels of anxiety and stress that could impact a medical students' experience during their M3 surgical clerkship. This negative perception perhaps is a determinant influence in diverting talented students into other medical subspecialties. We sought out to objectively identify potential areas of improvement through direct feedback and implement programmatic changes to address these areas. We hypothesized that as the changes were made students' perception of the rotation would improve.

**Actions, Methods, or Intervention** Review of end of clerkship third year of medical school trauma burn surgery rotation evaluations and comments was performed for the 2010-2011 academic year. Trends in negative feedback were identified and categorized into five areas for improvement as follows: logistics, student expectations, communication, team integration, and feedback. A plan was designed and implemented for each category. Feedback on improvements to the rotation was monitored via surveys and during monthly end of rotation face-to-face student feedback sessions with the rotation faculty facilitator and surgery clerkship director. Data were compiled and reviewed.

**Results** Perceptions of the rotation markedly improved within the first month of the changes and continued to improve over the study time frame (2011-2013) in all five categories. We also observed an increase in the number of students selecting a surgical residency in the National Resident Matching Program match from a low of 8% in 2009-2010 before any interventions to 25% after full implementation of the improvement measures in 2011-2012.

**Lessons Learned:** A systematic approach using direct feedback from students to address service-specific issues improves perceptions of students on the educational value of a busy trauma-burn acute care surgery service and may have a positive influence on students considering surgical careers to pursue a surgical specialty.

**Future Applications and Next Steps:** Student perceptions of an acute care surgery service clerkship can be improved by use of direct and indirect student feedback, systematic action plan implementation, and ongoing loop closure. In the future we will be using these concepts to continually improve the acute care surgery experience for all levels of learners.

## 4th Year Medical Student Elective in Multidisciplinary Thoracic Oncology

Quint, LE, MD; Reddy RM, MD

### BACKGROUND AND OBJECTIVES

Senior medical student education is trending toward increased subspecialization, and in some educational systems, students may choose to spend much of their senior year focusing on their areas of future practice. It can be helpful to broaden the horizons of these students via multidisciplinary training that is centered on their area of primary interest. This poster describes a 4<sup>th</sup> year medical student elective at our institution entitled “Multidisciplinary Thoracic Oncology” that aims to supply students with a broad and deep experience within a very focused area of medical practice. This elective is valuable to students pursuing careers in a variety of fields related to oncology. The objectives of this poster are to describe the methodology and curriculum content employed for this elective.

### METHODS

This four week elective employs a flipped classroom approach with didactic teaching materials that are delivered via an interactive online platform. Materials include recorded video-lectures with pre-lecture, post-lecture and embedded multiple choice questions (MCQs); case studies with a sequential, question and answer learning approach and embedded MCQs; a pre-course quiz and a post-course exam. These didactic materials are viewed by students at their own time and pace, typically during evenings and weekends. During daytime hours, the students rotate through relevant clinics/operating rooms/reading rooms, seeing patients, their diagnostic or therapeutic procedures, and reviewing their cases with attending faculty. The areas covered include Medical Oncology, Pathology, Pulmonology, Radiation Oncology, Radiology and Thoracic Surgery, focusing on patients with lung, esophageal and other thoracic neoplasms. Each student presents one or more of her/his patients at the weekly Thoracic Tumor Board meeting. The capstone project is a written case study or an oral presentation to the entire Thoracic Tumor Board based on a relevant topic and an actual patient.

### LESSONS AND CONCLUSIONS

Comments from students who took this elective indicated enjoyment of: “full engagement in the learning process and the patient care team” and “obtaining a well rounded, multidisciplinary understanding of the presentation and treatment of these patients.”

### NEXT STEPS

We are preparing a Massive Open Online Course (MOOC) on this topic, aimed at both University of Michigan and external health care practitioners in a variety of fields who care for patients with known or suspected thoracic cancers.

## **Fostering clinical judgment skills through remediation: A multimodal approach**

Price, D, DNP & Fenske, C, DNP

**Background:** Clinical education is a complex facet of nursing education in which faculty are challenged to promote development of student clinical judgment skills. Remediation has been utilized when students are at risk of failing their clinical practicum. A multimodal remediation program was developed that incorporated key elements shown to foster the development of clinical judgment including: 1) an individualized remediation plan; 2) low and high fidelity simulations using a virtual community (VC); and 3) student self-assessment of performance using the Lasater Clinical Judgment Rubric (LCJR).

An individualized learning plan provides the student with a clear action plan to promote improvement in their clinical judgment skills as it clarifies performance expectations. Simulation is a tool that provides a safe, non-threatening environment for students to practice and gain experience. A VC contributes to the enhancement of clinical judgment skills by aiding the students in the understanding of the character as a person and their unique patterns related to their illnesses. The LCJR provides a vehicle for self-assessment of clinical judgment skills, and provides student awareness of developing abilities.

**Methods:** This program was implemented with undergraduate nursing students who were referred by clinical faculty for not meeting clinical performance objectives. Initial evaluation simulations were used to develop an individualized learning plan for each student. Students and faculty used the LCJR to evaluate student perception of performance, as well as identify strengths and weaknesses. After 2 weeks of practice, a final evaluation simulation was completed and designed to showcase student progress.

**Results:** Faculty and students found the program improved clinical performance, increased confidence, improved organizational skills, and enhanced clinical judgment. Initial student self-assessment scores were at a higher level than their actual performance scores but the gap was reduced as student became more aware of their strengths and deficits.

**Future Applications:** A remediation course was formally developed, approved by faculty, and implemented in the School of Nursing during the Spring 2015 semester. Seven students enrolled and successfully completed this “Enhanced Clinical Competency Course”. Formal evaluation and follow-up with student progression through the professional nursing program is currently underway.

## Medical Student Curriculum Transformation at the University of Michigan Medical School

R Mangrulkar, MD; S Santen, MD, PhD; A Tsai, MBA; M Englesbe, MD; J House, MD; M Lukela, MD; E McKean, MD, MBA; S Monrad, MD; E Skye, MD

**Background:** Curricular change can be incremental or transformative. QI processes to improve curricula exist at most schools and frequently involve data-driven approaches that involve key stakeholders who analyze and present action items to improve existing curricular elements. Traditionally, large-scale curricular revision involve a greater number of stakeholders, and convene them in retreats and meetings to define a new model of medical education. However, embedded in these initiatives are the strong presence of traditional stakeholders, and the anchor of the current model, which limits substantial change. At Michigan we recognized that the breadth of the changes that were needed to address a new vision for the medical school required more than standard curricular revision methods, and would not be successful using traditional approaches to curricular revision that had been employed in 2003 and 1990 (the previous 2 curricular revisions). In addition, there had been 2 failed attempts at large scale curricular transformation at Michigan in 1988 and 2008 which also provided lessons on how to lead a transformation effort in education at Michigan.

**Actions, Methods, or Intervention:** We adopted the Kotter model for Leading Change, and deliberately managed a 2.5 year process that included several essential ingredients to engaging the medical school on this transformative change effort. These ingredients began with careful adherence to the first 6 (pre-launch) steps of Kotter's model which engaged all on "Establishing Urgency - Why Change", "Forming a Powerful Guiding Coalition", "Creating a Vision", "Communicating the Vision", "Empowering others to Act on the Vision", and "Creating Quick Wins"

**Results:** In June of 2015, the curriculum transformation was approved by a majority vote of the Executive Faculty, with 762 faculty voting. Four out of five faculty who voted approved of the curriculum plans and the process we are using to move forward. This was one of the largest turnouts for a faculty vote in many years. While much of the curricular implementation work remains ahead, the organization is engaged and moving towards to goal of transformation.

**Lessons Learned:** When engaging in large scale curricular change, it is insufficient to only use curriculum change methods and processes. One must engage a large set of relevant stakeholders in the input, design, and implementation of the change; these actions represent organizational change processes. Therefore, when engaging in large scale curricular change, one should employ both curricular change processes as well as organizational change processes in an integrated way.

## **Michigan Community Interprofessional Training Program (M-CIP): Training of Health Professionals for the 21<sup>st</sup> Century**

Rooks, A, MPA; Thomas, D, MPH; Rowley, P, BSN, MS, CHES

**Background:** America's changing demographic landscape will require health professionals to understand how to engage patients with respect to their cultural, historical and environmental contexts. "The ability to practice in a culturally competent manner within the frame of reference of one's patient(s) and/or the community of interest improves the delivery of appropriate care and enhances the likelihood that programs, services and policies will be relevant to diverse populations." (Cultural Competence Education for Students in Medicine and Public Health, 2012, p. 3) In developing the Service Learning Collaboration: Flu Shots in the Community, the training of students to understand the disparities in at-risk populations and be culturally appropriate in their communication was paramount for the success for appropriately engaging community members to administer flu shots. The training was developed specifically for Schools of Public Health and Nursing and the College of Pharmacy. Students participating were required to attend a 2.5 hour training with content on understanding disparities associated with influenza immunization, engaging communities (effective communication), explicit and implicit bias and implications for working with diverse communities.

**Actions, Methods, or Intervention:** Focus group data from African American seniors (age 55 years and older) and Hispanic/Latino migrant farm workers were used to design the training content which included didactic and interactive segments. The students were required to participate in role-plays using real-life scenarios associated with the myths and barriers toward influenza immunization and vaccine. Emphasis was placed on both verbal and non-verbal communication in the clinical setting.

**Results:** Seventy students participated in four (4) training sessions. Students from all three participating schools concluded that the workshop was relevant to their practice (99%), enhanced their knowledge (98%), and the teaching/learning resources were effective (93%). The significant majority (95%) of students believed the instruction they received to be very helpful overall. Student comments referenced that they gained inter-disciplinary experience, better understood the need for community involvement and outreach, and they gained confidence working diverse populations.

**Lessons Learned:** While providing students an opportunity to practice clinical skills, training the students to engage with patients sensitively and how "they" (bias, verbal and non-verbal communication) impact the interaction is equally important. To increase public health representation data collection is required to expand their role thereby reducing the disparity between clinical and non-clinical student roles. Recruitment must start earlier to insure an appropriate number of faculty preceptors to staff clinics. Case scenarios, in addition to role plays, are needed to strengthen interprofessional interaction.

**Future Applications and Next Steps:** The key impact was expanding the students' perspective to understand the importance of culture, environment and respect for diverse populations as important elements to provide quality care and promote positive interprofessional relationships that partner for the patient's well-being. Though, initially, designed to engage School of Public Health, School of Nursing and College of Pharmacy students, the partnership with UMHS Community Programs and Services (CPS) provides an opportunity to expand the collaborative to include other disciplines. CPS leadership is currently assessing the redesign of the community flu clinic to expand roles to engage students from other disciplines.

## **INCORPORATING ORAL HEALTH INTO PRIMARY CARE - AN IPE/IPC COLLABORATION BETWEEN DENTISTRY AND NURSING**

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Hamerink, H, DDS, University of Michigan School of Dentistry  
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### **Purpose and Background:**

Recent studies have shown that team-based interprofessional care of patients in hospital settings results in improved treatment outcomes and patient health. This type of care requires professionals from different health care areas to work together in a common clinical setting. Challenges in expanding this model into common primary care settings include finding effective ways to educate/train/change healthcare provider habits and measuring outcomes from such interactions. The main intent of the current push to increase IPE in health care curricula is to graduate new healthcare professionals who are better prepared to practice in an IPCP environment. To date, most IPE opportunities address IPCP theory and simulation instead of provide practical experience in patient care. Opportunities to apply skills discussed and developed in a practice-based setting are few and far between. This study evaluates the effectiveness of a dental-advanced practice nursing interprofessional education (IPE) experience on changing health care provider attitudes and patient treatment outcomes in a full service primary care health facility. It represents a collaborative project between the Michigan Health Council, the University of Michigan School of Dentistry and the University of Michigan School of Nursing that involves the creation and implementation of a standardized template or model that can be used for creating additional opportunities in a variety of settings. This presentation presents this model, reports preliminary data on the outcomes of care and impact on participants and discusses expansion of opportunities.

### **Methods**

A model for an IPE emersion experience that provides students a standardized IPE experience in an IPC environment was developed and implemented. Although this model can be implemented using any two professions and in any environment where IPC is a potential and valued care delivery method, the current implementation involved the collaboration between dentistry and nursing. Dental and Nurse Practitioner (NP) students from the University of Michigan collaboratively provided care (IPC care) for patients in the dental clinic at a FQHC in Flint, MI. When Nurse Practitioner students were not present, Dental students provided traditional non-IPC care for patients. Dental and Nurse Practitioner (NP) students worked together during 2 to 4 weeks rotations in a patient-centered IPE/IPC model in a facility serving an underserved population in the 200% poverty level or below. The students worked together to provided new patient intake screening, history taking, systems assessments and health care for patients in the dental clinic. This care included meetings to discuss patient needs and create patient centered treatment action plans, provision of dental and medical primary care and debriefing sessions to discuss findings, interventions and outcomes. Patient activation, quality of life, perception of treatment received and actual treatment outcomes were measured before and after treatment.

Student team performance was measured using an Interprofessional Collaborator Assessment Rubric (IPCAR) and student perception of the program was measured before and after clinic rotation assignment using a Participant Perception Indicator (PPI) survey modeled after the evaluation points in the IPCAR.

**Results:**

Eight Dental and eight Nurse Practitioner students to date have provided IPC patient care for 261 patients using the IPC model. Pre and post assessments for provider perception of IPC, patient perception of care received, patient activation and patient QOL were able to be measured without impeding patient care. Preliminary data will be reported. An IPE/IPC model that was developed to allow students to interact and provide patient care in a practice based IPE/IPC setting was validated. Preceptors involved in the model agreed that the model is universally adaptable to provider type and practice setting. Patients were highly receptive to the care provided

**Conclusions:**

An IPE/IPC model that was developed to allow students to interact and provide patient care in a practice based IPE/IPC setting was implemented and validated as being a feasible model that is accepted by patients and care facilities alike. This model is universally adaptable to provider type and practice setting.

**Future Applications and Next Steps:**

Plans are in progress to expand this model to other health care centers and involving students from dentistry, medicine, social work and occupational therapy across the state. The goal is to have all dental students experience at least one clinical IPE/IPC emersion experience in their final year of school by 2018.



## ***A Class in Creating Connections: An Innovative Mentorship Course and Experience for Pre-Health Students***

Walton, K, M.Ed.; Junn, J, MD; Sutton, J, MA; Morgan, H, MD

**Background:** In health care, mentorship has been shown to influence career choice, faculty retention, and is vital for professional and personal development. Yet mentorship for pre-health undergraduate students has not been studied; no best practices have been proven, and importantly no specific outcomes are known to result from this intervention. Our course sought to restructure and rethink education in the pre-health fields by pairing and providing direct faculty exposures and observation experiences within a curriculum that provided students with guidance through the mentorship process. The goal of our study was to investigate whether this early experiential pre-health mentorship for undergraduate students could improve their understanding of what would be expected in the real world of their anticipated career, increase their general understanding of effective mentorship, and change the content of and approach toward their immediate and long-term career goals.

**Methods:** A seven-week undergraduate course on mentorship was designed and implemented in the fall of 2014 for 26 sophomore pre-health students from the Colleges of Literature Science and Arts, Engineering, Nursing, and Kinesiology. Students had interests in the fields of medicine, nursing, public health, psychology, physical therapy, speech pathology, biomedical engineering and health care administration. Students were individually matched with a faculty mentor in their field of interest. Faculty included twenty physicians, one nursing faculty, one biomedical engineering faculty, one pharmacist, one speech and language pathologist, one health service educator, and one healthcare administrator. Students observed their faculty mentors in their professional and clinical settings. The mentorship course included sessions on creating effective mentorship relationships, building mentorship board of directors, and pitfalls of mentorship. Pre- and post-program surveys were sent to the undergraduate students electronically.

**Results:** Twenty-three of the 26 students (88%) completed the pre- and post-program surveys. Notably, participants assessed their own understanding of the expected work-life balance in their anticipated career to be improved (pre: 55, post: 70,  $p=0.006$ ). They also reported a greater understanding of the role and function of a mentor (pre: 67 post: 84,  $p=0.0005$ ) and mentee (pre: 71, post: 88,  $p<0.0001$ ), and a greater ability to be a good and effective mentor (pre: 74, post: 84,  $p=0.0131$ ) and mentee (pre: 79, post: 87  $p=0.0465$ ) themselves. No significant change was detected in the content of or approach toward their immediate and long-term career goals.

**Lessons and Conclusions:** Our mentorship course and experience provided pre-health students with an improved understanding of both expected career work-life balance and effective mentorship. This innovative approach has great potential to provide undergraduate students of diverse backgrounds a unique opportunity for quality mentorship, which could be potentially a transformative foundation for future career decisions.

# **Enhancing Communication and Confidence with Clinical Simulation: Pairing Nurse and Nurse Practitioner Students in Simulation Experiences**

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Aebersold, Michelle PhD, RN; Goryka, Berta, BSN, RN; Pike Moesta, Kim, BSN, RN

## **Background**

The complexity involved in role transition is a common and significant issue for students in the nursing profession. Undergraduate nursing students (BSN level) are focused on developing their clinical decision making skills and aptitude to communicate with other health care professionals. Graduate level Nurse Practitioner (NP) students continue to refine their decision making capability and are learning to transition to the role of team leader. They become the driver of care decisions and are responsible for coordination of care in collaboration with other healthcare professionals. Simulation experiences are utilized for both the BSN and NP students to facilitate active learning and foster a greater understanding of critical thinking and clinical reasoning. For both roles, the ability to communicate with other health professionals about clinical issues is a skill that can be developed. This project will pair the undergraduate BSN and graduate NP students in a simulated patient care setting where the BSN will need to be able to communicate concerns clearly to the advanced practice nurse. The NP student will then need to be able to address the issues presented and develop a plan of care to maximize outcomes. Previous to this there have been no structured interactions between the BSN and NP students in the simulation environment.

## **Actions, Methods, or Intervention:**

The University of Michigan School of Nursing is opening a new School including a State of the Art Clinical Learning Center and Simulation Suite that enables students to apply their skills prior to patient interaction in the clinical setting. Utilizing simulation methods, BSN students will engage in scenarios that will assist with the development of interaction and communication skills used to identify patient issues and communicate them with the NP student. The NP student will assess the patient in the simulation setting and develop a plan of care that may include interventions that require assistance by the BSN student. Anticipated items that will be addressed during the paired simulation include; care and medication order clarification, clinical findings, patient deterioration, patient and family information requests, patient–clinician conflict, and clinician–clinician conflict.

## **Results:**

This is in the preliminary/planning stage. Several scenarios have been developed and are currently in the process of designing learning objectives and outcomes for the BSN and NP student.

## **Lessons Learned:**

Anticipated outcomes addressed for BSN and NP students include increased confidence in the clinical setting with respect to physical assessment, development of clinical reasoning skills appropriate to the practice level, increased confidence to communicate with clinicians across disciplines and professions, enhanced ability to advocate for patients, and confidence in dealing with challenging care and clinician conflict.

**Future Applications and Next Steps:**

Anticipated implementation will be the winter 2016 term. Items that need to be addressed prior to implementation include specific evaluation criteria for each discipline, development of the clinical scenarios, design of the electronic medical record tool, and creation of the communication method.

# Effects of Image-Based and Text-Based Exercises on Student Learning Outcomes in a Musculoskeletal Anatomy Course

Gross, M, PhD; Greenberg, A, PhD; Wright, M, PhD; Anderson, O, PhD

**Background:** Research on benefits of visual learning has relied primarily on lecture-based pedagogy, not accounting for the processing time students need to make sense of both visual and verbal material (Tangen et al., 2011). In this study, we investigate the potential differential effects of text-based and image-based active learning exercises on student learning outcomes in an undergraduate functional anatomy course.

**Methods:** The study analyzed data from Movesci 230 - Human Musculoskeletal Anatomy, which is required for all students majoring in Movement Science (n=176). Each class session consisted of lecture segments punctuated with active learning exercises in which students worked independently or in pair-share dyads to answer interactive questions using LectureTools software. Linear multivariate regression analyses were used to look for correlations between performance on exam questions associated with active learning exercises and student participation in these exercises.

**Results:** There was a positive and strong relationship between participation (measured by the mean number of LectureTools exercises) and exam performance (based on the mean number of associated exam questions answered correctly) ( $r=0.63$ ,  $p<0.001$ ). Participation in image-based in-class questions was associated with higher exam scores, while participation in text-based active learning was not. We expected that prior GPA would have a significant relationship with exam performance, but interestingly, image-based active learning had a stronger effect ( $\beta=0.51$ ) compared to prior achievement ( $\beta=0.24$ ). URM status and gender were not significantly correlated with exam performance in this class, holding other covariates constant, suggesting that this benefit holds for a diversity of students.

**Lessons Learned:** The use of visual materials along with verbal cues has been shown to be particularly effective for low-knowledge learners (Kalyuga et al., 1998, 2000; Mayer, 2011), perhaps because students with less experience in a subject require additional information before generative processing can occur. Thus, the use of visual material may be particularly beneficial in this introductory course. Our finding about the positive impact of visuals when implemented during in-class exercises is significant for other STEM instructors who wish to design pictorially-based active learning exercises.

**Future Applications and Next Steps:** In the active learning setting, students have more time to process information, thus reducing cognitive load and potentially increasing deeper learning, particularly with image-based exercises. It is important to note that the course content in this study was highly pictorially-based, and a next step would be to test the robustness of the findings in an active learning classroom associated with a less visually-oriented STEM course.

## Learning Objectives for a Multidisciplinary Lactation Curriculum Based Upon a Needs Assessment

Pasque, K, MD; Stanley, K, MD

**Background:** Resident education in human lactation remains inadequate. Evidence of this gap includes physicians' characterization of their inability to manage basic lactation problems. We aimed to assess current knowledge, attitudes, and experiences of residents from pediatrics, medicine-pediatrics, obstetrics and gynecology, and family medicine programs, and to design educational objectives focusing on team management of the breastfeeding dyad.

**Actions, Methods, or Intervention:** We distributed a needs assessment to 150 residents in 4 medical specialties at the University of Michigan. We developed the assessment instrument based upon the pre-test of the American Academy of Pediatrics (AAP) breastfeeding residency curriculum and Williams' et al. breastfeeding questionnaire of Pediatricians-in-Training with modifications relevant to our institution. We then designed learning objectives based upon study responses.

**Results:** Response rate was 74%. Residents lacked breastfeeding knowledge related to latch, sore nipples, plugged ducts, expression and storage of milk, formula supplementation, radiologic imaging during lactation, and contraindications. 28% believed that formula constitutes a good substitute for breast milk. Although 92% felt providers should strongly encourage breastfeeding, 29% reported they would feel embarrassed by a breastfeeding toddler. 29% have counseled fewer than 2 patients about breastfeeding. 59% lacked confidence in managing common breastfeeding problems.

**Lessons Learned:** Although breastfeeding is widely recommended and ACGME requires breastfeeding education, residents from multiple specialties demonstrate deficits in lactation competencies. Many are uncomfortable with common breastfeeding practices. Most lack experience and confidence in managing breastfeeding problems. Based upon this needs assessment, we designed learning objectives that focus on changing attitudes and improving lactation knowledge and experiences.

**Future Applications and Next Steps:** We are developing educational strategies to achieve the learning objectives. In July 2015 we launched a pilot curriculum that provides short, interactive educational sessions during a multidisciplinary conference. We will study how our curriculum affects resident knowledge and attitudes about lactation.

# ***Optimizing Patient Care Curriculum: Bridging Three Domains of Knowledge for a Fully-Integrated, Longitudinal Curricular Thread***

Mani, NS. PHD; Purkiss, J. PHD; Mangrulkar, R. MD

**Background:** As U-M Medical School embarks on a major, comprehensive curricular revision, we have significantly modified and expanded curriculum components related to medical decision making. Previously, instruction in this area was provided over the first three year years of medical school in different courses and clerkships via a series of curricular experiences that combined lectures, small group problem-solving sessions and computer informatics workshops. While the former approach was successful by some key measures – e.g., students' scores on biostatistics and clinical epidemiology components of national licensure exams were well above the national average – the previous curriculum architecture limited the integrated longitudinal approach that is needed in order to create habits of inquiry and reflection that are required for lifelong learning. Using a conceptual model adapted from Hoffman et al. (2014), we have set the goal of achieving a fully-integrated curricular thread that encompasses a comprehensive set of inter-related skills: (1) Evidence-Based Medicine (including clinical informatics), (2) Patient-Centered Communication Skills, and (3) Shared Decision-Making, which we have called the Optimizing Patient Care Curriculum (OPCC).

**Actions, Methods, or Intervention:** An interdisciplinary team with combined expertise in the three OPCC foci developed an inaugural curriculum for first-year learners. Learning objectives have been developed, and experiences (some completed; many in development) encompassing each of the three OPCC domains, with integration points in the following curricular areas: M1 Launch (the expanded first-year orientation during the first weeks of medical school), Foundations in Molecular Medicine (the first sequence of the M1 year, with a focus on biochemistry and genetics), Chief Concern Course (a longitudinal course with a focus on clinical reasoning), and Initial Clinical Experience (a longitudinal first-year clinical experience with a focus on patients, healthcare teams, and healthcare systems). Through intentional planning and collaboration, faculty from OPCC and the aforementioned curricular areas have been building a truly integrated curricular thread. OPCC elements which are being integrated into curricular components are being designed by incorporating experiential learning (Kolb, 2014) and critical reflection (Schön, 1987) frameworks to ensure experiences that are meaningful, active, integrated, and reinforced. Through pedagogical approaches that include self-directed learning, utilization of the flipped classroom framework, small group discussion, and individual reflection, students are being exposed to content related to diagnostic reasoning and clinical epidemiology, clinical informatics, decision making for populations, patient centered communication, and decision making with patients.

**Results:** Student feedback on initial OPCC sessions has been favorable. Sessions during M1 Launch yielded the following evaluation outcomes: 90% of students Agree or Strongly Agree that “Overall, the OPCC activities increased my understanding of patient-centered communication”; 78% of students Agree or Strongly Agree that “Overall, the OPCC activities increased my understanding of clinical informatics”; 88% of students Agree or Strongly Agree that “Overall, the OPCC activities increased my understanding of shared medical decision-making.” Among students’ narrative comments were the following: “I am so impressed by how intentionally-designed the 3 sessions were. I was just raving about it to my parents. Thank you!” “Fabulous introduction to this curricular thread.” “This and Thursday were the best days of the week!” Furthermore, collaboration with directors and faculty from other curricular components is proceeding successfully, and is now moving in both directions – i.e., OPCC faculty seek out and are sought out by faculty from other curricular components to develop integrative learning experiences.

**Lessons Learned:** Compared to developing a stand-alone curriculum, a primary challenge when integrating a curricular thread such as OPCC lies in the additional effort required to fully integrate material from multiple domains in a manner that builds sustainable habits, opportunities for inquiry, and also touches all relevant elements of the new curriculum in ways that are synergistic. By assembling an interdisciplinary team to develop the curriculum, and by intentionally and proactively seeking and achieving points of collaborative integration with other curricular components, we were able to initiate a fully-integrated, longitudinal curricular thread.

**Next Steps:** Next steps include summative evaluation of current OPCC based experiences to identify the extent to which content from all three domains were appropriately woven into curricular areas, and provided opportunities for students to start developing habits of inquiry. In addition, focus will be placed on identifying additional OPCC integration points that are optimal in helping learners engage in foundational skills and knowledge using an OPCC lens; this will be done using a multipronged approach including program evaluation surveys, and program reviews which include learners, course/sequence directors, and OPCC faculty.

## Graduated Autonomy: Entrusting Senior Residents to Teach Junior Residents

Sandhu, G, PhD; Magas, CP, MBS; Robinson, AB, PhD; Minter, RM, MD

**Background:** Education of residents in the operating room is simultaneously a salient interaction in the development of future independent surgeons; as well as a high risk enterprise where maintaining patient safety is critical. Faculty surgeons consider their responsibility not only to patients they care for today, but also to future patients cared for by residents they graduate. Charged with balancing these responsibilities, faculty directly observe residents and make deliberate entrustment decisions to move learners from assistants to independent practitioners. It is imperative to better understand entrustment decisions and behaviors among faculty-resident dyads to determine which interactions support graduated operative autonomy.

**Actions, Methods, or Intervention:** 62 residents and 37 faculty members participated in semi-structured interviews. Participants were selected using stratified random sampling of general surgery residency training programs representing national geographic distribution and training environment diversity as designated by FREIDA.<sup>1</sup> Interviews were transcribed and coded using a constructivist grounded theory approach.

**Results:** One of the major themes identified as reflective of intraoperative entrustment interactions is ‘providing residents with opportunities to lead cases when appropriate.’ A significant subtheme emerged which was ‘faculty surgeons entrusting senior residents to teach junior residents.’ The following faculty quote exemplifies this subtheme: “When [senior residents] get to that point where I want them to start taking other residents through, that is probably the biggest signal that I am giving them more autonomy.”

**Lessons Learned:** One method by which faculty surgeons grant greater autonomy to residents is by entrusting senior residents to take junior residents through a case. When a senior resident is granted this opportunity, trainees are aware that they are being entrusted as evidenced through resident interviews. Unpacking faculty decision making to determine when this high degree of autonomy is granted will lend itself to informing entrustment interactions among faculty-resident dyads, with the ultimate goal of graduating safe independent practitioners.

**Future Applications and Next Steps:** Future directions will include the development of faculty and resident training materials for enhancing understanding about behaviors which support entrustability and optimize interactions in the operating room to support the attainment of autonomy.

### References:

1. American Medical Association, *Fellowship and Residency Electronic Interactive Database Access System*. 2015.

## **Assessment method for grading medical students during elective specialty radiology clerkship**

Authors: **Wasnik, AP, MD and Quint, LE, MD**

Department of Radiology, University of Michigan Hospital and Health Systems

### **Background:**

Fourth year medical students rotating through the specialty abdominal imaging radiology electives at our Department observe and work with different faculties each day (given various subspecialty assignments of the faculties e.g. CT, Ultrasound, GI/GU fluoroscopy, MRI, EAA) during their 4 week rotation. The students are evaluated by the Division Director of medical student education at the end of rotation, and grading based upon few sessions of direct observation during reading room rotation, final week oral case presentation and on verbal feedback from faculties and residents- the final scoring may thus be considered subjective thereby questioning the validity of the grading system. The project was undertaken to develop a standardized assessment/evaluation method for increased transparency and validity.

### **Actions, Methods or intervention:**

It has been described that assessment could be validated if following factors are used- multiple observations by different assessor, use of descriptors, keeping the assessment recent to avoid lag-time recall bias, and importantly the assessee being aware of the assessment.

A daily assessment form was developed based on 4 basic criteria- medical, imaging based knowledge, professionalism and communication, and the grading was performed using descriptors rather than Likert's scale. Space for free comment was provided, which would be helpful to give direct feedback to the students. The assessment form was completed and submitted digitally/ electronically daily by the attending radiologist with whom the student worked each day. A mean score was generated at the end of 4 week rotations. The student also had to present oral case conference in the final week and a scoring system for evaluation of the presentation was also developed. The students were aware of the grading system and the parameters used in assessment. The final grades were based on the mean score of the daily assessment (75%) and the final oral case presentation (25%).

### **Results:**

Six students during Feb to July 2015 were assessed using the proposed method. The average faculty response for completing the daily assessment form was 15 of 20 day. The comments provided were used to provide mid-rotation and end of rotation feedback to the medical students which were well appreciated by the students. The oral case presentation assessment form was available to the students, which helped them to use the pointers for maximum scoring and improve their presentation skill. The final grades calculated from the daily assessment mean score and oral presentation score was useful in alleviating the error of subjective assessment, the biases of lag-time recall and central tendency (which was more common at the end of rotation verbal feedback from the attending). The daily assessment method was



presented at the Radiology medical student education committee and approved for use by the other divisions in the department.

**Lessons learned:**

Assessment in any form needs to be valid and transparent, and it becomes more important when assessing the medical students who strive hard to achieve high grades and score. A system which alleviated the commonly encountered biases (subjective assessment, central tendency and lag-time recall biases) appears more valid and above all it helps the assessor to provide the much expected feedback to the students which helps them to strengthen/develop their areas of improvement. The knowledge of being assessed gives the assessee a benefit to perform the best. The proposed evaluation method appears to be a valid and timely method of assessing and grading the medical students during their radiology rotation.

**Future Applications and Next Steps:**

The daily assessment method was presented at the Radiology medical student education committee and approved for use by the other divisions in the department. Over the course of next year, the effectiveness of this method will be assessed from short anonymous feedback from the students following their rotation.

University of Michigan Medical School Medicine in Spanish Program  
A longitudinal program to train Spanish-speaking medical students.

Porter, R.; Waldmann, J.; Schoen, J.; Gonzalez, A., MA; Sanchez, R., MD.

**Background:**

In 2009, a group of University of Michigan Medical Students conducted a needs assessment within the UMMS and found an interest among students to create a curriculum to improve Spanish-language skills with the goal of training physicians that would be able to serve the Spanish-speaking community in the US and internationally.<sup>1</sup> Since then, several programs have been created by students and under the mentorship of Ramon Sanchez, MD and Ana Gonzalez, who now teaches the formal UMMS Pre-clinical Medical Spanish elective and M4 Medical Spanish elective.

**Methods and Current Program:**

Currently, the Medicine in Spanish program is directed by the Medicine in Spanish Curriculum Committee (MSCC), a group of students within LANAMA (the Latin American and Native American Medical Association). Ana Gonzalez teaches an elective course, primarily for M1s, for students with an intermediate-advanced background in Spanish to build Medical Spanish vocabulary and be able to conduct a patient history and physical in Spanish. A student-taught introductory course is also offered to pre-clinical students who have a lower level of Spanish. Students with a higher level of Spanish or who have already completed the elective participate in the Discussion Group where Spanish-speaking physicians lead case studies in Spanish. Ana Gonzalez also leads an M4 elective that focuses on advanced Medical Spanish skills such as writing SOAP notes and interacting with other physicians in Spanish. The MSCC also facilitates service projects to the Spanish-speaking community in Michigan, an interpreter shadowing experience, opportunities to participate in Spanish rounds in the hospital, and online materials to aid in practice and language maintenance.

**Results:**

Data has only been collected from the formal Medicine in Spanish pre-clinical elective. Students in this elective are required to pass a written exam and a Standardized Patient Interview (SPI) to receive credit from the class. These evaluations are also administered in the beginning of the year to measure the improvement over the course. In 2013-2014, the pre-course average for the written evaluation was 58.3% (SD 11.5%), and the post-course average was 95.5% (SD 2.3%) with an average improvement of 37.3% (SD 13.0%). Similarly, the pre-course average for the SPI was 41.8% (SD 12.3%), and the post-course average was 79.6% (SD 5.9%) with an average improvement of 37.9% (SD 13%). Furthermore, self-evaluations and formal curriculum evaluations show that students feel more confident with their vocabulary, patient interaction skills, and cultural competence with respect to Hispanic communities after taking the course.

**Conclusions and Future Directions:**

After several years of development and implementing improvements, the Medicine in Spanish program has become a prominent part of the UMMS curriculum. The program has grown both in the number of students participating and the breadth of programs offered. In the future, we will initiate an M2 advanced review elective, expand the online materials, and find more ways to engage with the Spanish-speaking community in Michigan. These new initiatives will strengthen the longitudinal aspect of our program so that students have a solid, consistent base to use in their careers.

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<sup>1</sup> Holaday, et al. Development of a novel pre-clinical Medical Spanish program at the University of Michigan. 2013.

## **Unified Online Calibration System for Faculty Assessment, Student Self-Assessment, and Student Peer-Assessment Across Preclinical and Clinical Learning Environments.**

McLean, M, DDS; Bayne, S, MS, PhD; Fitzgerald, M, DDS, MS; DePeralta, T, DMD, MS, PhD; Van Tubergen, E, DDS, PhD, Karl, E, DDS, PhD; Jin, Q, DDS, PhD.

### **BACKGROUND:**

Preclinical/clinical assessments of patient care occur throughout professional education in multiple settings. Despite similar objectives, assessments use different assessors, scales, and outcome measures. This educational research project proposed a model for consistent assessment (1) across all learning environments (preclinical, clinical) (2) for all assessors (full-time faculty, part-time faculty, residents) and learners (self-assessment, peer-assessment) for clinical restorative procedures (3) using online training/calibration techniques. It addresses a major student feedback theme of inconsistent and poorly documented teaching/grading. A major design goal of the project is creating a generalized model easily adapted to any healthcare setting.

### **METHODS:**

A limited version of the online program (training / calibration) for restorative dentistry was created and piloted to pretest components. One procedure (cavity preparation) was digitally displayed at 5 angles with optional magnification. Clinical cases (n=5) were rated in 4 categories (C1,C2,C3,C4) using universal grade criteria. An initial target value for calibration was 85%. Pilot tests tracked questions, did an item analysis, and provided feedback. The project is OPEN ACCESS, portable, and accessible from all digital devices (desktops, laptops, tablets, mini-tablets, smart phones). Beyond obvious regular advantages, it can calibrate new instructors, improve student self-assessment, be used in OSCE's, and be employed in clinical research. It has an adaptable design.

**RESULTS:** Initial calibration performance (n=21 faculty) was only 45% overall, varied by category (C1=34%, C2=46%, C3=53%, C4=49%), and varied across questions (Q1=42%, Q2=68%, Q3=43%, Q4=59%, Q5=38%). Variations in scores were +/-1 category with no dominance in difference patterns.

### **LESSONS LEARNED AND CONCLUSIONS:**

Carefully devised and well-accepted universal criteria for all teaching/learning situations were very challenging to develop. Mean calibration levels for all categories and all questions were far below the original target level of 85%. Initial results confirm student claims. Familiarity and system practice is expected to improve calibration levels.

### **NEXT STEPS:**

Self-assessment data is being analyzed. Tracking of faculty/student training and practice is underway. Problematic questions are being carefully reconsidered. The online system is being expanded in scope to include all situations and exam devices.

## Taking a *SecondLook*<sup>™</sup> at a Time-Efficient Self-Evaluation Resource

Hortsch, M, Ph.D.

**Background:** Interactive review tools are highly valued by today's students. The *SecondLook*<sup>™</sup> Histology resource was developed for University of Michigan students to test their knowledge and skills in analyzing micrographic histology images. Originally conceived as a series of PowerPoint files, it is also available as a mobile application.

**Actions, Methods, or Intervention:** Efficient time management is a major concern for many students. Students want to know whether they have learned the required material and developed the expected skills to do well in an upcoming examination. As a consequence, "high yield resources" that make the most of limited study time are in high demand. In order to help students review the material, gauge their knowledge of histology and assess their competency of recognizing/identifying cells and tissues, we developed the *SecondLook*<sup>™</sup> self-review tool. This resource is available to University of Michigan (U-M) students as a series of PowerPoint files and, through collaboration with U-M Medical School Information Services, to students worldwide as a mobile application. Each PowerPoint file/app set covers the material of a specific tissue or organ on 10-35 slides, each slide containing histological images with 1-8 questions about these images. The questions on each page are asked sequentially in a logical succession, one question often building on the answer to the previous. Using the PowerPoint animation feature, a click/tap reveals the answer together with any follow-up question. The questions use a variety of open-ended formats, avoiding a "select-the-best-answer" MCQ design. Each set takes 10-15 minutes to complete, enabling students to quickly uncover deficiencies in their knowledge and skill sets and allowing them to target their study efforts to fill these gaps. This didactic approach relies heavily on active learning – it uses technology and electronic devices (computers, tablets and smartphones) and lets students receive immediate feedback, often with a brief explanation why an answer is correct. To expand the accessibility of the *SecondLook*<sup>™</sup> tool, the U-M Medical School's Learning Design and Publishing team has generated a strategy that allows the easy translation of *SecondLook*<sup>™</sup> PowerPoint files into HTML-based applications for a range of mobile devices (both iOS and Android). The application version has several features not available with a PowerPoint file, such as a slide randomizer function, easy navigation between slides, question and page indicators, and a limited zoom ability.

**Results:** Over 95% of recent U-M medical students named the *SecondLook*<sup>™</sup> PowerPoint files as one of their three most important histology learning resources. A similar percent of U-M medical and dental students also reported that they always or frequently used the *SecondLook*<sup>™</sup> files. Since its release 2.5 years ago, the *SecondLook*<sup>™</sup> Histology application for the iPad has been downloaded from Apple's iTunes Store over 11,000 times from 115 different countries.

**Future Applications and Next Steps:** Although the *SecondLook*<sup>™</sup> concept was originally designed for a subject represented largely by visual material, it can easily be adapted to other fields, including clinical case studies. *SecondLook*<sup>™</sup> series for Neuroanatomy, Gross Anatomy, and Oral, as well as Basic Medical Radiology are currently in development and will serve students in a number of different biomedical career paths. Making *SecondLook*<sup>™</sup> tools available for a wide range of basic science

and clinical topics will encourage students from all fields of the health sciences to apply a scientific approach to learning and will integrate the Socratic process in clinical problem solving.

## Taubman Health Sciences Library Outreach

Wang, J, MPH;  
Schnitzer, AE, AMLS

**Background:** Staff members from A. Alfred Taubman Health Sciences Library have collaborated with other campus units in providing outreach efforts for the past decade.

**Actions, Methods, or Intervention:** Hands-on workshops; demonstrations; promotion of online resources from the National Library of Medicine.

**Results:** A. Alfred Taubman Health Sciences Library is a member of the National Network of Medical Libraries, which is a part of the Greater Midwest Region (GMR) of the National Library of Medicine (NLM). As such, the informationists along with other staff of the Library take part in the GMR outreach program. Collaborative efforts with UMHS and other interested units are always welcomed. Outreach @ GMR The goal of our outreach programs is to expand partnerships and implement activities with network members and other institutions and organizations to improve awareness of and access to health information resources for health professionals, the public health workforce, and members of the public.

**Lessons Learned:** There are always new communities and new opportunities to strive for because of changing demographics and changing technology.

**Future Applications and Next Steps:** Staff members plan to continue providing outreach and hope to be able to collaborate with more UM units in doing so.

# A novel *Minute Feedback System*

David T. Hughes MD, Rishindra M. Reddy MD, Gurjit Sandhu PhD, Susan Ryszawa BA, Michael Englesbe MD.

## **Background:**

Medical students crave feedback from faculty and residents, yet they often cite a lack of timely, relevant feedback. The hypothesis of this study was that development of a *Minute Feedback System* would generate frequent, relevant and documented feedback for students during the surgery clerkship.

## **Actions, Methods, or Intervention:**

A *Minute Feedback System* was created using the Qualtrics© survey software. Through an emailed web survey link students select faculty and residents with whom they worked during the day. A link to the feedback survey is emailed to the selected faculty or resident evaluator. The time required for the faculty to complete the survey was intended to be less than 1 minute. Completed feedback data is collected in a secure database and is instantly sent via email to the student. Students were surveyed about the frequency and quality of feedback and their overall rating of the surgery clerkship on a 5 point Likert scale.

## **Results:**

The initial pilot of the *Minute Feedback System* involved 6/34 M3 surgery clerkship students and generated a total of 70 unique comments from faculty and residents over 3 weeks. When the 6 pilot students were compared to the 28 students without access to the *Minute Feedback System*, they respectively rated the frequency of feedback 4.50 vs 2.83( $p<0.01$ ); the quality of feedback 4.70 vs 3.33( $p<0.01$ ) and the overall rating of the surgery clerkship 4.67 vs 4.05( $p<0.01$ ) higher.

Based on this initial data the *Minute Feedback System* was made available to all students on the M3 surgery clerkship ( $n=31$ ) over the subsequent 2 month clerkship rotation. 354 unique feedback comments from faculty and residents were generated over the 2 month period from 399 student requests. Students using the *Minute Feedback System* ( $n=31$ ) compared to students in the previous academic year without ( $n=170$ ) rated the quality of feedback (3.76 vs 3.4,  $p<0.01$ ), that feedback was provided during clerkship (100% vs 90%,  $p<0.01$ ) and the overall quality of the clerkship (3.94 vs 3.87,  $p=0.2$ ) higher.

## **Lessons Learned:**

The novel *Minute Feedback System* allows for frequent, timely and relevant faculty and resident feedback to medical students and may be beneficial in other clerkships and residency programs in improving teacher to learner feedback.

## **Future Applications and Next Steps:**

The novel *Minute Feedback System* has potential for larger scope use with medical students and residents across disciplines.





## ***Health Professions Education Day – Abstract***

### **Virtual software to personalize student learning in a required pharmacy course**

Kelling, S, PharmD, MPH, BCACP

#### **Background:**

There is significant variation in the amount and type of experience related to pharmacy practice that students have prior to entering a professional pharmacy program. This is particularly relevant to student learning in the College of Pharmacy required two credit hour Pharmacy Practice Skills I course that is taken by approximately 85 students during the fall semester of their first year of pharmacy school. In this course a wide variety of concepts and skills are taught. One of the key skills taught in the course is medication dispensing, which requires knowledge and application of topics such as pharmacy law, pharmaceutical calculation, frequently prescribed medications, and utilization and integration of tertiary drug information resources. Students with previous experience may have mastered some of the basic skills; however, for students without previous pharmacy experience, these skills are new and it takes time for them to learn and master. These differences in experience make the “one size fits all” approach to course design difficult to engage all students in meaningful learning. In order to create a more personalized learning experience, it was decided that a virtual medication dispensing software program would be implemented.

#### **Actions, Methods, or Intervention:**

MyDispense, a customizable open access virtual medication dispensing software program, was developed by Monash University in Victoria, Australia. A strength of this program is that it allows an instructor to create medication dispensing modules that increase in complexity over time. For example, students may need to identify an error with a prescription, call the doctor regarding a drug interaction, or use a drug information resource to provide patient counseling. During the fall 2015 semester, students will use the virtual simulation software in six skills labs. One week prior to each lab, students will gain access to six optional practice exercises with immediate formative feedback. Students will be advised that the optional out-of-class exercises cover similar skills as the in-class lab and exam exercises. Students will complete two exercises during each lab with discussion facilitated by an instructor. The midpoint and final practical exams will each include a station where students complete a virtual medication dispensing exercise.

#### **Results**

The two research questions that will be studied are (1) whether a virtual approach can create an engaged learning environment for students within a course construct where previous background experiences directly impacts engagement and learning and (2) whether there are significant differences in utilization of virtual medication dispensing software based on previous professional experience. Data will be collected and analyzed regarding previous pharmacy experience, utilization of the optional practice exercises, midpoint and final practical exam performance, and perceptions of the use of the program via a survey.

#### **Future Applications and Next Steps:**

Perhaps the most important finding of this project will be to determine if a virtual approach to learning can effectively engage students with different backgrounds as it relates to course objectives and outcomes. If we can show this outcome, this will have important implications in regard to future course design within and outside the University. In regard to the College of Pharmacy, the findings of this project will be used to determine if a virtual approach to engage learning will continue to be utilized in the Pharmacy Practice Skills I course as well as whether practice exercises should be required or optional. Based on conversations with other faculty within the College of Pharmacy, there is interest in potentially using virtual software in other courses. This project may help to determine the strengths and challenges of incorporating this type of learning experience into the curriculum. If students find value in being able to choose the appropriate

amount of non-graded practice material based on their experience and comfort with the content, other areas of the Pharmacy Practice Skills I course may be transitioned to this model. Furthermore, the use of virtual software to personalize learning may also be of interest to other disciplines where students have a wide range of backgrounds and experiences, both within and outside health professions education.

# The Lesion: Teaching Neurologic Localization with a Multi-player Board Game

London, Zachary, MD  
Burke, Jim MD

## **Background:**

The brain communicates with the rest of the body through electrical pathways that are unique to the type of information they are carrying. Any of these pathways may be disrupted by a focal abnormality, or lesion, of the nervous system, causing signs and symptoms that correspond to the disrupted pathway. Neurologists use their knowledge of these pathways and how they overlap to diagnose neurologic diseases. This process is called localization, and mastery of it is a quintessential part of both medical student and resident education in neurology. There is currently a shortage of interactive modalities for teaching neurologic localization.

## **Actions, Methods, or Intervention:**

We created a tabletop board game called, *The Lesion: Charcot's Tournament*. Game play is based on both strategic thinking and an understanding of neurologic localization.

## **Results:**

*The Lesion: Charcot's Tournament* has been licensed through the University of Michigan Technology Transfer. We have used it as part of our Neurology PGY-1 Boot Camp rotation and made it available for distribution online. ([www.thelesion.com](http://www.thelesion.com))

## **Lessons Learned and conclusions:**

The Lesion is a popular and entertaining way to learn neurologic localization in a small-group setting. It appeals to the competitive nature of our learners in a socially acceptable environment. We hope to incorporate The Lesion into our preclinical neuroscience curriculum as an active learning modality to introduce students to this topic.

## Video Podcast and Production Services for Educators

Chapman, Chris, MA; Engling, J, MA; Stephens, M, MAED; Westfall, J, BS; Yao, A; Markovac, J, PhD

Video use is becoming an increasingly important part of medical education. Although the University of Michigan Medical School (UMMS) has been recording lectures for many years, changes in the undergraduate medical curriculum and in medical education in general have generated a demand for different types of video production to support learning and teaching. For example, rather than recording the more traditional hour-long lectures, some faculty are creating short, 5-7 minute video/image narrations to support "flipped classroom" experiences. Other faculty are using video vignettes to demonstrate communication and physical examination skills. In order to meet these innovative educational needs, the Learning Design and Publishing (LDP) group from Medical School Information Services (MSIS) has developed a suite of services to support faculty and staff who wish to produce video products for teaching and learning.

This demonstration will provide examples of how to incorporate video to support medical education, including:

- the flipped classroom
- communication skills development
- history taking
- physical examinations
- sharing medical and scientific knowledge

Attendees will learn how LDP works with faculty and staff to:

- create live action and short video vignette productions (writing, working with actors, students, and standardized patients)
- use the LDP podcast studio (located in the Taubman Health Sciences Library) to produce narrated PowerPoint and Khan Academy-style videos
- develop striking video animations
- collaborate with students to help produce relevant and interesting videos that will capture their attention

This demonstration will show how to develop and utilize video more effectively for a vast array of educational needs and will introduce the attendees to the support and services provided by LDP.

## ***FastApp* - A Service to Support Mobile Technology for Educational Content**

Chapman, Chris, MA; Engling, J, MA; Stephens, M, MAED; Westfall, J, BS; Yao, A; Markovac, J, PhD

Educational "apps" are popular with learners and instructors as they provide quick, convenient access to learning materials on small, portable devices. Advances in mobile technology have simplified and expedited the production and distribution of apps for iOS and Android systems.

Capitalizing on these developments, the MSIS Learning Design and Publishing (LDP) group has launched a service to help faculty create and publish educational apps. As part of this initiative, LDP has created a set of methodologies and practices that make it easier for faculty to work collaboratively with developers and students on app design. This process leads to products that more accurately address the instructional objectives of teachers and the educational needs of learners.

Our demonstration will provide examples of mobile applications developed by LDP in conjunction with medical school faculty and staff. Products include:

- *SecondLook*<sup>™</sup> (histology review app)
- *The Eyes Have It* (interactive teaching and assessment program for vision care)
- *Orthotics* (orthopaedic surgery board review program)

The LDP initiative establishes scalable workflows that empower faculty to:

- author content with PowerPoint (which is then translated into the app format)
- interact directly with developers and designers to actively participate in the design process
- share apps with the UM community using "enterprise" distribution and with potential users worldwide via the Apple App Store and Google Play.

Attendees of this demonstration will learn how to publish their own educational apps by making use of the support and services provided by LDP.

## **MSIS Transformations to Support Medical Student Education**

Patton, J, MD, MHI

The Learning Informatics group provides subject-matter expertise, data flow analysis, and technology implementation to support the education mission of the Medical School. Through collaboration with faculty, staff and students, we advocate for effective uses of technology in learning and teaching, both in the Medical School and across the University. Taking a holistic approach to providing information services in academic medicine, we strive to advance the future of healthcare through discovery and lifelong learning.

For the past year the goal of Medical School Information Services (MSIS) Learning Informatics group has been to support the Medical School curriculum transformation. We are able to achieve this goal supported by many of the other groups within MSIS.

Our demonstration will highlight some of the many ways MSIS has improved our previously existing technologies to support the medical student curriculum transformation. Highlights include a new mobile friendly medical students gateway; a redesigned clinical grading application, Amadeus; introduction of the new learning management system, Canvas; and elements of the new Learner Portfolio, including the Outcomes Dashboard.

**MSIS Book Publishing Program:  
Multi-Platform Content Distribution for Medical Education**

Kleinman, Molly, MSI;  
Kost, Karen, AA

**Background:** One goal of the Medical School Information Services (MSIS) Learning Design and Publishing (LDP) team is to make research and educational content produced at the University of Michigan Medical School as widely available as possible, utilizing a wide range of publishing platforms and techniques. Because different users have different publishing preferences and needs, LDP partners with faculty, students, and staff from U-M Health Sciences departments to self-publish their materials in traditional print and in a variety of digital formats to maximize their reach and effectiveness.

**Actions, Methods, or Intervention:** LDP provides the expertise and skills to assist authors and editors through the steps necessary to disseminate their content across a wide range of well-positioned, high-visibility publishing vehicles. We work with faculty, staff, and students to help them identify their publishing goals, and to develop, refine, and customize their materials for publication. LDP provides our customers with specific services such as copyright clearance, manuscript preparation, copy-editing, graphics arts, and cover design, throughout the life of the publishing project. Through our partnership with the University Library and Michigan Publishing, finished books (print and e-books) are sold on Amazon, and we can also sell books in the iTunes Store (iBooks). Depending on the desire of the author, we can also make electronic versions of the content freely available and downloadable (.pdf, epub) on the Open.Michigan website under Creative Commons licenses.

**Results:** Our book offerings range from extremely popular collections of stories written by patients/for patients (*Chronicling Childhood Cancer: A Collection of Personal Stories by Children and Teens with Cancer*, edited by a U-M undergraduate student who is now a medical student), to affordable textbooks (*Clinical Approach to Ocular Motility: Characteristics and Orthoptic Management of Strabismus*, a textbook updating the author's original text, first published in 1980, list price \$19.99), to conference proceedings (*Building Academic Partnerships to Reduce Maternal Morbidity and Mortality: A Call to Action and Way Forward*, a product of the 1000+ OBGYN project). We find that print books are still the most popular publishing vehicle, although the market for books via electronic outlets (e.g., Kindle, iTunes, GooglePlay) and Open Educational Resources (e.g. open.umich.edu) is steadily increasing.

**Future Applications and Next Steps:** With our streamlined book production workflow, LDP plans to increase the number of books that are self-published and to expand the number of outlets on which they are available for purchase and download. Apple's iBook platform offers opportunities to make specialized interactive books, while our partnership with Michigan Publishing will enable us to expand our both our electronic and our print-on-demand offerings.

## ***Health Professions Education Day – Abstract***

### **U-M School of Public Health’s “Innovation in Action: Solutions to Public Health Challenges”**

Ann Verhey-Henke, Managing Director, Office of Innovation & Social Entrepreneurship

**Background:** *Innovation in Action: Solutions to Public Health Challenges* (IIA) is a five-month co-curricular experience, open to all U-M students, graduate and undergraduate alike. The goal of IIA is to create a safe environment for students to take risks and move beyond the classroom through an immersive, experiential, cross-disciplinary team-based program that equips them with an innovator’s toolkit and an ecosystem that nurtures the skills necessary to be life-long innovators.

**Actions, Methods, or Intervention:** The School of Public Health’s Innovation and Social Entrepreneurship program runs IIA in partnership with the Center for Entrepreneurship (ENG), the School of Information, the Entrepreneurial Law Clinic (LAW), Zell Lurie Institute (ROSS), optiMize (LSA) and other U-M student organizations. Together we share our expertise with student teams through a skill-building module framework to: identify and understand the problem, build effective teams, design a creative solution, measure impact, etc. From creating an app to ensure better medication adherence for HIV/AIDS patients to developing a prototype for a better breast pump, student teams have demonstrated the potential of innovative programs like IIA to transform passion for social change into enterprises that can have an impact outside University walls.

**Results:** In two years, IIA has engaged over 150 students across 17 of the 19 U-M schools and colleges, with 37 cross-disciplinary teams completing the five-month process (each team has representation from at least 2 units on campus). Preliminary quantitative analysis of post-participation survey data indicates an array of positive outcomes, including self-reported increases in innovation knowledge, motivation and identity. Participants cited the acquisition of real-world skillsets as a key result of the program.

**Lessons Learned:** Both empirical and qualitative assessments of the program demonstrate that participants obtain the expanded knowledge and inter-disciplinary experience needed to take innovative solutions beyond the classroom. From one participant: “I now have a much more robust understanding of how to design, develop, and implement an innovation in the field of public health. I feel much more confident about thinking of public health challenges within the context of innovative interventions.”

**Future Applications and Next Steps:** IIA’s success has generated interest across campus and outside U-M, encouraging our team to consider: what is our larger vision for the program *and* how can we better serve all U-M students? With these questions in mind, and the support of a Quick Wins / Discovery Grant from the University of Michigan Third Century Initiative, we plan to expand in two key ways:

1. Create *Innovation in Action: Solutions to X Challenge*, where X is a topic that students care passionately about across disciplinary boundaries. We will begin with “Solutions to Education Challenges” in the 2015-2016 academic year.
2. Build targeted curricular supplements to the program, allowing students to bookend their IIA experience with more expertise for course credit.