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# Tufts University School of Medicine Mary Y Lee, MD, Medical Education Day Poster Abstracts

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# Tufts University School of Medicine Mary Y Lee, MD, Medical Education Day Poster Abstracts

The following abstracts represent posters of Tufts University School of Medicine (TUSM) research and innovation projects in medical education (in progress and completed).

The goal of this conference is to promote faculty educational research and provide faculty development with opportunities to engage in cutting-edge topics in medical education. Faculty have the opportunity to show their scholarly medical education work to TUSM's community through posters and oral presentations, and participate in educational workshops.

## **EDUCATIONAL OBJECTIVES**

To have participants:

- 1) Share their work on medical education research with TUSM's community.
- 2) Analyze new trends in today's health professionals' education.
- 3) Select in interactive workshops of their choice to broaden knowledge and skills related to medical education.

# Preparing Students for Effective Patient Handoffs: A Study to Evaluate the Effectiveness of a Handoff Curriculum

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- Introduction:** Information transfer during patient handoffs between healthcare providers is common, and handoffs are recognized as a time when patient care errors are likely to occur. While residency programs highlight effective patient handoffs in clinical competency requirements, few medical schools in the US have formal handoff curricula and incoming resident physicians report feeling unprepared for handoff obligation. Our objective was to prepare third year medical students (MS3s) to be proficient in giving and receiving patient handoffs.
- Methods:** The intervention is a blended learning curriculum using the COMSEP and AAMC Entrustable Professional Activities (EPA) handoff competencies as a framework. The intervention consists of pre-reading, a 1 hour workshop, and completion of a handoff Doc Card. Third year medical students (MS3) rotating through their Pediatric Clerkship at Tufts Floating Hospital for Children received the intervention, which was qualitatively evaluated. IRB approval was obtained.
- Results:** Nearly half of MS3s had not learned about patient handoffs. Students felt the pre-workshop assignments were helpful and spent a reasonable amount of time completing them. The majority of students agreed or strongly agreed that the didactic portion of the workshop was useful, that the handoff simulation session was useful to improve handoff performance, and that the handoff scenarios were appropriate for MS3 knowledge level. The majority of students perceived an increase in their comfort with handoffs after the workshop.
- Conclusions:** Although incoming residents are expected to perform patient handoffs, many MS3s do not learn about patient handoffs. We propose a handoff curriculum that was well received and useful in improving MS3 comfort with patient handoffs.
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# Advancing Statewide Medical Curricula by Harnessing Massachusetts' New Medical Education Competencies in Prescription Drug Misuse

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**Introduction:** Despite recent efforts, pain continues to be underrepresented in medical education, particularly in proportion to the population's burden of pain. A public health initiative introduced by Massachusetts' Governor and implemented by the state's Commissioner of Public Health, convened medical educators from the state's four medical schools to develop consensus medical education competencies to address pain and prescription drug misuse. The resulting competencies, while emphasizing the prevention and management of prescription drug misuse, included significant competencies in evaluating and treating pain safely and effectively. The specific aims of this investigation were to (1) compare and contrast how these competencies were applied in each of the medical schools, (2) highlight relevant educational innovations and (3) describe challenges and barriers in advancing pain education.

**Methods:** We reviewed the innovative initiative led by the Department of Public Health (DPH) and educators from each of the four medical schools in Massachusetts, placing special emphasis upon the roles of top-down versus bottom-up initiatives in medical education. We collected information from medical educators designated at each institution to implement these DPH-designated competencies regarding the processes taken to reform curricula, specifically: (1) the initial process of approving and including the competencies; (2) furthering other ongoing and proposed initiatives; (3) new initiatives; and (4) developing enduring curricular materials.

**Results:** Competency approval processes for the four institutions were similar, each mapping the newly introduced competencies onto the existing curricula and delegating execution to specific faculty. Vertical integration was important at all 4 schools. New initiatives at each institution in response to the new mandatory competencies are summarized in the Figures.

**Conclusions:** Professional organizations initiatives have reached consensus as to health professionals' pain-related competencies and have disseminated these nationally and internationally. While curriculum development can be facilitated by top-down, cross-institutional initiatives, the process also requires institutional content experts and faculty champions to create materials and learning opportunities. This statewide competency initiative provides a focus for advancing medical education in pain, but only by building additional pain-related expertise at the institutional level will medical education in pain be more fully realized.

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## REFERENCES

1. Massachusetts Governor's Working Group on Medical Education 2015
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# Ensuring New Medical Graduates' Competencies in Pain: Introduction of a Third-year Pain Direct Observation Card in Required TUSM Clerkships

YS Bradshaw, W Altman, S Epstein, A Wohl M'18, M Zhukovsky M'18 and S Hossain, M'16, S Cerulli M'18, J Seiden M'18, B Nguyen M'16, A Levin-Scherz M'16, KZ Hassan M'16, CD Tourjé M'16, DB Carr

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## Background and Objective

We developed a Pain Direct Observation Card (DOC) for third-year core clerkships, hypothesizing it would be a helpful learning tool to assess and understand patients with pain.

## Instructional methods, materials used and evaluation approach

Faculty and 4<sup>th</sup>-year medical students enrolled in a pain education elective developed a new pain DOC card within an existing framework for faculty observation of student interactions with patients. This new DOC card was designed to facilitate faculty direct observation of student competencies in the initial assessment and management of pain. The observed competencies according to a patient-centered mnemonic taken from the pain literature; assess ("A") intensity, quality, psychosocial and functional aspects; believe ("B") and validate the patient's symptoms; choose ("C") or propose appropriate pain control along with use of a prescription drug monitoring program; discuss ("D") management options and treatment goals; and empower ("E") patients to collaborate with providers. The card also provides space for student to document the pain source, treatment plan and challenges/reflections. Students complete one Pain DOC card per clerkship rotation.

## Educational outcomes to date

Students reported that the Pain DOC provided opportunities to be observed and receive feedback. To evaluate the intervention, 4<sup>th</sup>-year medical students conducted a content analysis of 79 Family Medicine Clerkship Pain DOCs. Extraction of student comments identified six themes; we developed corresponding academic goals. The paired reflective/ educational goals were: patient requesting opioids/clarify appropriate use of opioids for pain and need for patient education; lack of management options/increase familiarity with acute and chronic pain treatments; shared decision-making/collaboration to arrive at a plan; and depression/anticipating and educating patients on mood disorders in acute and chronic pain. We further mapped these educational goals onto a national analysis of interprofessional pain competencies.

## Innovation's strengths and areas for improvement

Students found the concise Pain DOC simple and useful. This content evaluation provides insight into unmet student educational needs. Additional content analyses based upon larger student samples from different clerkships are planned.

## Feasibility of maintaining program and transfer to other schools/programs

TUSM educators continue to support the program. Further evaluation will provide an instrumental means to assess students' unmet educational needs and their interactions with patients regarding pain and function.

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- 1 Hsieh, H-F, Shannon, SE. Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*. 2005;19(9):1277-1288.
- 2 Fishman SM et al. Core Competencies for Pain Management: Results of an Interprofessional Consensus Summit. *Pain Medicine*. 2013;14:971.
- 3 Fishman SM et al. Scope and Nature of Pain- and Analgesia-Related Content of the United States Medical Licensing Examination (USMLE). *Pain Medicine*. 2018;19:449.

# The Impact of Integrating Interprofessional Case Scenarios, and Confederates into Formative Objective Structured Clinical Exams.

Peggy R. Cyr, MD, MA, Julie M. Schirmer, LCSW, Victoria Hayes, MD, Wayne Altman, MD, Meghan Keane, MSIV, Corinn Martineau, PharmD, BCACP

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## Background and Objectives:

Interprofessional education is a critical component of medical student training, yet is often difficult to implement. Medical students who learn with, from and about learners from other disciplines have been shown to create more effective and safe health care teams. The use of confederates (an individual in addition to the patient who is scripted in a simulation to provide realism, additional challenges, or additional information for participants) is one method used to achieve this. The investigators wanted to know the impact of integrating interprofessional scenarios into formative Objective Structured Clinical Exams (OSCEs) at Tufts University School of Medicine (TUSM).

## Methods

For the academic years 2017 and 2018, two interprofessional case scenarios were integrated into OSCEs for third-year medical students at TUSM, with a social work confederate added to an end-of-life scenario and a pharmacy confederate added to a chronic pain scenario. Medical students participated in didactic training surrounding IPE and received structured feedback regarding interprofessional competencies following simulation cases. Changes in interprofessional knowledge and attitudes were assessed by comparing student pre- and post-scenario scores on the Interprofessional Socialization and Valuing Scale (ISVS-21): a 21-item Likert-scale survey. Paired t-test analysis was performed on individual pre- and post-ISVS means.

## Results

Three hundred and eighty four (91%) of the 417 participating students completed pre- and post-surveys. Students reported a pre-ISVS mean score of 4.95 (n=363), a post-ISVS mean score of 5.60 (n=356), indicating significant change in interprofessional knowledge and attitudes (mean difference in matched pairs = 1.3,  $p < .0001$ , n=384). Students and faculty rated the interprofessional cases very highly and provided valuable feedback to improve and add to the interprofessional cases and process.

## Conclusion

Placing interprofessional cases into OSCE events is easily replicated, and positively impacts students' interprofessional knowledge and attitudes.

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# Doc 4 A Day: Utilizing Maine Medical Center's Medical Education Department and the Hannaford Center for Safety, Innovation & Simulation to Engage High School Students in a Health Career Pipeline

Vicki Hayes, MD and Janell Lewis, MS, CHES

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Part of our role as healthcare providers is educating the next generation of healthcare workers. We created Doc 4 A Day, a novel, half-day pipeline program that introduces primarily underserved high school students, grades 10-12<sup>th</sup>, to a health career by placing them in simulated patient scenarios, hands-on skill sessions and dialoging with medical students, residents and other health care professionals about their career pathways.

Attributes of this program include:

- Accommodating many participants simultaneously
- Allowing participants to be in active patient care roles
- Removal of concerns about patient privacy, confidentiality, or safety issues through simulation
- Role-modeling interprofessional collaboration and team-based care
- Medical students and residents as mentors and teachers

## **Evaluation:**

Students participated in a pre and post-test survey (3-point Likert Scale) that showed statistically significant increases ( $p < .05$ ) in self-ratings of knowledge about healthcare career choices and educational pathways. Additionally, 92% indicated an intention to pursue college or higher education and 77% indicated an intention to pursue training in a healthcare career after participation in Doc4aDay.

In 2018, a follow-up survey was conducted designed to explore whether the program had a lasting impact on participants' pursuit of a health care career. An email including a survey link was sent to past participants (2012-2018), with a 27% completion rate ( $n=42/154$ ). The most influential aspects of the program were reported to be the patient simulations and the suturing skills lab. Twenty-one percent were still in high school ( $n=8/42$ ). Of the remainder, 70% ( $n=26/42$ ) were in college, with 21 of them (81%,  $n=21/26$ ) pursuing a health-related career.

## **Summary:**

The strengths of this program include the use of simulation, hands-on skill sessions, demonstration of interprofessional collaboration and medical learners as teachers. Participant surveys demonstrate improvement in knowledge related to health care careers. Of those who responded, a high percentage of former high school-graduate participants are pursuing a health-related career.

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# The Effect of Incorporating Ultrasound into the Medical Anatomy Course on Students' Knowledge and Confidence

Rebecca S. Lufler, Linda Afifi, Robert Willson, Peter Croft. Tufts University School of Medicine and Maine Medical Center

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**Introduction:** Ultrasound (US) is becoming more pervasive across medical specialties and therefore requires training and education earlier in the undergraduate medical curriculum. Given the difficulty of handling, acquiring and interpreting US, early exposure is imperative. Combined and integrated learning has been shown to be beneficial and has led to integrated curricula in medical schools across the country. Finding the right place to integrate US is the challenge. The purpose of this study is to evaluate the effectiveness of the US curriculum based on students' perceptions of US, confidence in interpreting and acquiring US images, and performance on US exam questions.

**Methods:** An US curriculum was developed and incorporated into the first-year medical clinical anatomy course at Tufts University School of Medicine. Student participation in the study was voluntary and the study was granted exempt status by the IRB (#12737). Students were asked to complete an online pre-survey evaluating their confidence in using US and their perceptions of US prior to the start of the US curriculum in the anatomy lab using an 11 point Likert Scale. Students rotated through an US station during 5 labs, covering 5 different regions during the anatomy course. Students had the opportunity to watch US being performed, as well as gain hands on experience acquiring US images. Video primers for each lab were posted for students to prepare and use as study tools for exams. US questions were included on all written and practical exams. Students completed a post-survey evaluating their changes in confidence and perceptions. Mean Likert ratings on pre- and post- surveys were compared to evaluate student's perceptions and confidence. Performance on US based exam questions were evaluated as percent correct.

**Results:** Students reported significantly higher mean confidence ratings on understanding US, ability to operate US, ability to obtain US images, ability to recognize artifacts, and ability to interpret normal anatomy images ( $p < 0.0001$ ) after completing the US curriculum. Students also reported that US reinforced anatomy concepts, as well as clinical correlations ( $p < 0.0001$ ). Students disagreed with items stating learning US is not too difficult for a student to learn ( $1.2, \pm 2.2$  SD) and that it interfered with learning anatomy ( $0.68, \pm 1.7$  SD). On the four course exams, the average percent correct on US questions for each exam was 94.2 (Back and Lower Extremity), 91.6 (Upper Extremity and Thorax), 80.6 (Abdomen and Pelvis), and 96.7 (Head and Neck).

**Conclusions:** This US curriculum has proven to bolster students' knowledge and perceptions of bedside US, and has given them confidence in image acquisition.

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# Validation of a modified Jefferson Scale of Empathy for observers to assess trainee empathy

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**Introduction :** “Demonstrate insight and understanding into emotion and human response to emotion“ has been identified as a pediatric residency competency amenable to simulation-based assessment. The Jefferson Scale of Patient Perceptions of Physician Empathy (JSPPPE) is validated for patients to assess provider empathy, however, a version adapted for a 3<sup>rd</sup>-party observer doesn't yet exist. We modified the JSPPPE and used recorded standardized encounters to determine its validity.

**Methods:** This cross-sectional study used video and data collected from two pediatric residencies. Four raters reviewed 24 videos of 12 interns communicating with standardized patients (SP) in two encounters and completed a modified JSPPPE for observers (JSEO). Reliability between raters was established using Intraclass Correlations (ICC). JSEO mean scores were correlated to Essential Elements of Communication (EEC), JSPPPE, and faculty composite interpersonal communication (IC) scores using Spearman Rank. Secondary analyses examined effects of the SP, scenario or the learner gender using a Mann-Whitney U test.

**Results:** The mean ICC for all 4 raters was 0.573 (0.376-0.755). When ICC was calculated for pairs of raters, Rater 1 was an outlier for all pairings. ICCs for mean scores for pairs among the three remaining raters was 0.81 to 0.84. Mean JSEO scores from the four raters strongly correlated with the JSPPPE ( $\rho = 0.45$ ,  $p = 0.03$ ) and IC ( $\rho = 0.68$ ,  $p < 0.001$ ), but not the EEC ( $\rho = 0.345$ ,  $p = 0.1$ ). No differences in EEC, JSPPPE, IC, nor JSEO scores were found based on SP, or intern gender ( $p > 0.34$ ).

**Discussion:** Our findings suggest that the modified JSPPPE for an observer can assess empathy in a trainee encounter with a SP. This may be useful for graduate medical educators as they shift toward competency-based tracking. The inherent usability of this tool and potential assessment using video are also appealing.

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# “Student-driven small-group learning: the use of student Team Leaders in the gross anatomy laboratory”

Jeffrey Marchant, PhD; Robert Willson, PhD, MS  
Tufts University School of Medicine

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**Introduction:** Preparation for gross anatomy laboratories is essential for a productive and efficient experience. Our objective was to assess whether having students serve as a Team Leader (TL) in the laboratory facilitated student learning, improved table dynamics and improved exam scores. Additionally, we sought to determine if exam scores differed for tables when they did or did not have TLs. To facilitate preparation for serving as a TL, dissection videos were prepared for each region; to be fair, these were made available to all students.

**Methods:** For the two exam units included in the study we divided the class into groups that had TLs for four consecutive labs and then four labs without. Test scores could then be tabulated for the two conditions, assessing both individual and group outcomes. At the end of the course, survey questions were added to the course evaluations to obtain individual student ratings for the TL component.

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**\*Results will be presented at the conference.**

# Improving the Effectiveness of an Initial Consultation Request: An Intervention Study

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- Background:** Consultation occurs in a variety of medical settings in order to improve the quality of patient care. The AAMC recognizes that the skills needed to provide an effective consultation request should be developed before the start of residency. However, formal education on requesting a consultation during medical school is rare.
- Objective:** The objective was to train 3rd year medical students on the pediatrics clerkship to perform an effective consultation request by teaching the 5Cs standardized method of consultation (5Cs).
- Methods:** The curriculum taught the 5Cs via either a 20-minute video + workshop, or the video only. Each clerkship block was alternated between the two curriculum interventions and a control group. Student confidence and effectiveness of the curriculum were evaluated using pre- and post-intervention surveys and a simulated consultation request using a standardized case. Blinded faculty evaluators completed a validated checklist for telephone consultation (12 items rated as “Done” or “Not Done”) and a single overall effectiveness rating measured on a 5-point Likert scale.
- Results:** 110 students were eligible. 101 were included (32 in control, 31 video-only, 38 in video + workshop). Logistic regression model revealed a statistically significant increase in the completion of 5 checklist items for the interventions groups compared to the control group. A Kruskal-Wallis H test showed that there was a difference between the groups in the overall effectiveness rating,  $\chi^2(2) = 6.591$ ,  $p = 0.03$ . Further Mann-Whitney tests revealed that the video + workshop group effectiveness rating was higher than the control group ( $U = 380$ ,  $p = .01$ ). Confidence improved in all groups ( $p=0.00$ ), though ANCOVA results suggest that students in the video + workshop group had higher confidence compared to the control group in requesting a consult and giving a concise story. The majority of the students in the intervention groups reported the interventions were at least somewhat effective (based on a 5-point Likert scale).
- Conclusion:** Formal instruction with the 5Cs method led to improved observed skills on the simulated consultation. The video instruction (+/- workshop) is an effective, low-resource intervention to improve consultation skills and give students’ greater confidence. Abstract: Wellness in Teaching: a dynamic educational intervention to improve faculty performance
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# Wellness in Teaching: A Dynamic Educational Intervention to Improve Faculty Performance

Sue Rose, MPH; Vicki Hayes, MD; Amy Segdwick, MD, FACEP, E-RYT; Christine Hein, MD; Bryan A Lamoreau, MD

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- Introduction:** For providers in an academic setting, there are expectations for teaching that can add stress to the emotional demands of clinical practice. There is scarce data for the role of curricula aimed at prevention of burnout in academic clinicians. The objectives of this curriculum were to educate faculty on wellness theories and tools to specifically improve flow, mindfulness, and resilience. By the end of the course participants should be able to analyze their own applications of wellness within their practice.
- Methods:** This was a 6-week pilot program containing 3 modules targeting all clinicians and learners in the MaineHealth system. Each interprofessional module was 2 weeks in duration consisting of two 2-hour in person workshops consisting of lecture, small group work and question and answer methods that taught the wellness concepts of flow, mindfulness and resilience. Regular yoga practice was used to reinforce the practical application of these concepts. We had an n=9. Participants were asked to practice yoga twice a week at a minimum. Pre and post qualitative surveys and validated scales of these concepts were used to assess the effects of the program. Changes in scores were analyzed using pair t-tests. Two coders conducted the qualitative analysis.
- Results:** We found four themes emerge in our qualitative data: being more mindful, being less reactive, work/life balance, and applying strategies to teaching. Quantitative analysis of the 3 validated scales showed statistically significant improved scores in mindfulness, resilience, and flow.
- Conclusion:** Qualitative themes were consistent with the goals of the course and feedback was positive. Conscious changes to workflow in the teaching environment were already taking place by the end of the course. Participants reported, one of the main barriers for clinicians participating in the program was securing enough time to commit to the program. This program increased educators' sense of well-being and teaching self-efficacy.
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# Re-Engineering an Inpatient Clinical learning Environment to Optimize Interprofessional Collaborative care and Education

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Maine Medical Center

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- Introduction:** As a recipient of the Accreditation Council for Graduate Medical Education (ACGME) Pursuing Excellence in Innovation (PEI) grant, Maine Medical Center sought to analyze, deconstruct, and re-engineer an inpatient clinical learning environment, with the goal of optimizing interprofessional collaborative care and education, patient and family experience, quality and safety of care, and provider experience.
- Methods:** In preparation for the initiative, a formal healthcare systems engineering analysis was undertaken, in collaboration with the Northeastern University Healthcare Systems Engineering Institute (HySE). Using this analysis, we redesigned the team structure and functionality in a newly opened 18 bed inpatient internal medicine and cardiology unit. Key elements of the redesign included: patient and care team cohorting; scheduled, structured patient appointments, with team-based rounding and real-time care planning and documentation; intentional team-based education and QI programs; and continuous interprofessional reassessment with cyclical improvement, utilizing the unit as a “learning laboratory”. Formal assessment included: team functionality (using Relational Coordination [RC]), patient and family satisfaction (using written surveys), learner and provider satisfaction (using formal qualitative interviewing methods), and patient outcomes.
- Results:** Team functionality, as measured by RC, improved significantly after implementing the intervention. Patient and family satisfaction has been overwhelmingly positive. Non-physician learners and providers have uniformly favored the model. Resident physicians have at times struggled with adapting to the model, especially in comparison with the familiar models of care in other settings. Hospital length of stay and cost/patient have been significantly lower using the model, as compared with matched patients cared for on a control unit using standard practices.
- Conclusions:** Deliberate re-engineering of an inpatient clinical learning environment can result in improvement in patient/family and provider satisfaction, as well as improvements in efficiency of care. Establishing and maintaining significant changes in practice can be stressful, particularly for resident physician learners.
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# Developing, Implementing, and Evaluating a One Week Community Based Educational Experience Focused on Healthcare Disparities for Internal Medicine Residents

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**Introduction:** Structured Internal Medicine resident education in healthcare disparities and population health had not previously been a focus at Maine Medical Center (MMC). The aim of this pilot one week community based educational experience was to expose residents to various community organizations that provide care to vulnerable patients in Portland, ME.

**Methods:** The Preble Street Learning Collaborative (PSLC) is a novel collaboration between MMC and Preble Street Social Services which provides a multitude of services for people at risk of homelessness by an interdisciplinary team of medical providers and case managers.

We developed a week long resident rotation that focused on working with organizations including Preble Street Services, Greater Portland Health (GPH - a Federally Qualified Health Center), Homeless Health Partners (HHP - intensive case management for patients at risk of homelessness), and Milestone (an inpatient detoxification program focused on the underserved).

Eleven Internal Medicine Residents participated in the rotation, ten residents completed both pre and post rotation surveys. Pre and post rotation surveys evaluated changes in perceived knowledge and utilization of the community organizations. The survey data were summarized by descriptive statistics and analyzed for significance by McNemar’s test.

**Results:** There was a significant increase in perceived knowledge of roles of and services provided by both GPH (p=.021) and HHP (p=.008). The rotation increased the likelihood of residents referring patients to or communicating directly with the community organizations (Table 1).

**Table 1.** POST-rotation: Are you more likely to refer a patient to or communicate directly with a provider at these community organizations?

	Frequency, (n%)		
	GPH	HHP	Milestone Recovery
Not more likely	0 (0.0)	0 (0.0)	1 (9.1)
A little more likely	2 (18.2)	3 (27.3)	3 (27.3)
A lot more likely	7 (63.6)	5 (45.5)	5 (45.5)
Extremely more likely	1 (9.1)	2 (18.2)	1 (9.1)

**Conclusion:** This pilot educational initiative demonstrated increases in perceived resident knowledge in and intent to utilize community resources for patients experiencing homeless. The knowledge of organizations providing services to the homeless is essential to caring for the underserved by our residents.

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