READINESS FOR INTERPROFESSIONAL LEARNING AMONG MEDICAL, NURSING, AND PHYSICIAN ASSOCIATE STUDENTS AT AN AMERICAN UNIVERSITY
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BACKGROUND: The Liaison Committee on Medical Education recently adopted a new standard for interprofessional curricular experiences citing the importance of collaborative education and practice for improved patient outcomes, safety, and quality of care. Currently at our university there are few opportunities for medical, nursing, and physician associate students to collaborate. A curricular redesign is in progress that will provide robust interprofessional learning opportunities for students from the start of training longitudinally through graduation. The aim of this study was to determine baseline perceptions among first year health professions students at one American university towards collaborative learning and practice.

METHODS: First year students in three professional programs [medical (n=101), nursing (n=81), and physician associate (n=35)] were sent an anonymous online survey in January 2012 which included six items related to demographic information, as well as the 19-item Readiness for Interprofessional Learning Scale (RIPLS). This validated, widely-utilized scale measures the readiness of healthcare students for shared learning. Scores on the RIPLS and its four subscales were compared among the three groups of students using SAS 9.3 by the general linear model.

RESULTS: Surveys were completed by 70 (69%) medical, 71 (88%) nursing, and 25 (71%) physician associate students. Scores on the RIPLS indicated that all three groups of students scored in the high range, indicating readiness for shared learning. Female students, those with advanced degrees, and those with healthcare experience prior to enrollment in health professional school had significantly higher scores than their counterparts. After controlling for differences in demographic factors, nursing students scored significantly higher (83.06) than physician associate (76.84, p<0.0001) and medical (76.41, p<0.0001) students. There was no difference between physician associate and medical student total scores.

CONCLUSIONS: Health professions students from three training programs within an American university demonstrated readiness for interprofessional learning early in their academic programs, however nursing students demonstrated greater readiness than medical and physician associate students. Our findings are similar to those reported in studies from Canada and New Zealand, but different than reports from the United Kingdom and Singapore. Previous work suggests that entering nursing students think collaboratively, in contrast to medical students who think in individualistic terms. It is possible that students with an interest in or a skill set suited for team-based case are attracted to the nursing profession. In contrast, physician associate students learn in the medical model, and the scores of these two groups of learners were similar. In order to optimize the value of curricular innovations that emphasize interprofessional education, it may be necessary to create learning groups that balance predictive features of readiness for interprofessional learning, such as program type, gender, and prior healthcare experience or graduate degree. Extrapolation of predictive features across countries may not be appropriate.
THE IMPACT OF JOB BURNOUT ON MEDICATION PRESCRIPTION ERRORS IN FIRST-YEAR INTERNAL MEDICINE RESIDENTS

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BACKGROUND: Job Burnout has been increasingly recognized as common among internal medicine (IM) residents. Several studies have found that residents with burnout are more likely to self-report suboptimal patient care than those who are burnout free. Few studies have objectively measured the correlation between resident burnout and medical errors. We hypothesize that residents with burnout are more likely to commit medication prescription errors than their burnout-free counterparts.

METHODS: We administered a survey containing the Maslach Burnout Inventory to first-year IM residents at the Icahn School of Medicine at Mount Sinai twice between June 2011 and June 2012. Burnout was defined by a high score on either the depersonalization or emotional exhaustion domain, in keeping with the most widely used convention. Subsequently, data on all medication orders placed by these residents during the same 1 year period were collected. Based on pharmacy annotations, prescriber orders with the potential to cause adverse drug events (e.g. drug interactions, incorrect dosing) were identified and measured as a rate of errors per 100 prescriptions. Individual burnout scores and prescription error rates were linked using anonymous identifiers and analyzed for correlations using SAS statistical software.

RESULTS: Of the 54 eligible first-year residents, 53 (98%) completed an initial survey and 32 (59%) completed a follow-up survey. Burnout prevalence was 36% (19/53) at the beginning of intern year and 75% (24/32) at year's end. Burnt-out residents had a significantly lower rate of pharmacy interventions compared with their burnout-free counterparts in both the initial survey (0.558/100 vs. 0.752/100; p=0.005) and the year-end survey. (0.553/100 vs. 0.780/100; p=0.007)

CONCLUSIONS: Burnt-out residents committed fewer prescription errors when compared with their burnout-free colleagues. This finding was contrary to our initial hypothesis and inconsistent with previously published findings based on self-report. Given the low error rate and the uncertain clinical significance of a correlation between burnout and decreased prescriber errors, further research is necessary to evaluate the link between job burnout and patient care in IM residents.
TIME IN TRAINING AND CLINICAL SKILLS AS MEASURED BY UNANNOUNCED STANDARDIZED PATIENTS
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BACKGROUND: The ACGME's Next Accreditation System uses outcomes to determine readiness to practice, reflecting growing awareness that simply completing required years of training may not guarantee competence. Measuring those outcomes, however, continues to be a challenge for Residency Programs. Unannounced Standardized Patient visits - standardized clinical scenarios played by highly trained actors integrated, incognito, into providers' clinical schedule - represent a very promising method for assessing "true" competence. In the context of exploring time- vs competency-based determination of physician preparation, we report on the relationship between time in training and clinical skills as assessed by USPs in a sample of Primary Care Internal Medicine Residents.

METHODS: 4 USP cases were developed to represent common primary care challenges: Educating a patient about her diagnosis (Education); Teaching a patient to take medications correctly (Medication); Assessing underlying reasons for a non-specific complaint (Tiredness); and Counseling on health maintenance and behavior change (Health Promotion). Visits were fielded with Primary Care residents in a small residency program (n=24) over 5 years. 35 residents treated the "Education" USP (22 PGY1, 6 PGY2, 7 PGY3); 34 residents treated the "Medication" USP (22 PGY1, 5 PGY2, 7 PGY3); 35 treated the "Tiredness" case (18 PGY1, 9 PGY2, 8 PGY3); and 36 residents treated the "Health Promotion" case (20 PGY1, 7 PGY2, 9 PGY3). Behaviorally anchored checklists were used by USPs to rate performance in: Communication, assessment, physical examination, education/counseling, management plan, and patient activation (4-11 items/domain). Scores were calculated as % items rated well done (vs. not or partly); internal consistency was > .70 for all. Time in training was assessed by PGY and as cumulative months of training. Independent samples Kruskal-Wallis tests were used to determine if the distribution of competence scores differed by PGY; correlations assessed the relationship between months of training and competence scores; and hierarchical regressions explored the influence of months of training after controlling for residents' scores on a PGY1 OSCE (baseline competence).

RESULTS: The distribution of competence scores did not consistently differ by PGY for any of the 4 USP visits (Kruskal-Wallis tests p>.05). Only 4/24 possible correlations between time in training (months) and competence score (4 cases x 6 domains) were significant (Pearson's r; p<.05): In the Medication case, assessment and physical exam scores were negatively correlated with time in training (r=-.58 and -.41); patient activation scores were positively correlated with time in training in the Tiredness (r=.42) and Education (r=.28) cases. Similar results were obtained after controlling for "baseline" (PGY1) OSCE performance: Months of training accounted for small amounts of variance in assessment scores for the Medication and Health Promotion case (R² range .09-.16; Std Betas=-.27 and -.34); in exam scores for the Medication case (R²=.17; Std Beta =-.32); and in Patient Activation scores for the Tiredness and Education cases (R² range .08-.12; Std Betas=.20 and .25).

CONCLUSIONS: If USP visits are valid and reliable assessments of "true" clinical competence, then time in training does not appear to be a good indicator of competence. However, our exploratory study was powered to detect only fairly substantial effects. In addition, our checklist may be subject to expertise reversal effects as evidenced by negative associations between training and assessment and examination, where highly skilled physicians may omit less relevant information gathering. Our results, however, do suggest that clinical competence is not simply a product of time in training.
BACKGROUND: Inter-professional collaboration (IPC) is essential for effective and safe practice, especially in new models of team-based patient care. Understanding physicians' competence in communicating with team members over the phone is a critical first step to designing targeted curricula and workplace learning experiences. This study sought to assess internal medicine residents' baseline IPC phone competence.

METHODS: Inter-professional phone skills were assessed in a 10-minute case with a "Standardized Nurse" (SN) as part of the annual 11-station OSCE for Primary Care Residents (PGY1-3, n=23). This outpatient case called for the physician, speaking on the phone with the RN played by a trained actor (SN), to develop a treatment plan to address their patient's recent increase in Hemoglobin A1c and creatinine, which required the discontinuation of metformin and insulin adjustment. In addition, residents were expected to recognize two errors made by the nurse. A checklist was created to assess widely accepted IPC, general communication and case specific skills. The IPC items (9) included: clarifying roles; eliciting full information using check-back technique to clarify; using C.U.S. to state Concern, feeling Uncomfortable, and that issue was about Safety; respect (valuing team member information and assessments); and teamwork (developing a plan, delegation). "SNs" were frame-of-reference trained to complete the checklists. Item response options were: not done, partly done and well done, each with descriptive behavioral anchors. Summary scores were computed for IPC and Communication items within the IPC case and communication items for the overall OSCE as % of items rated well done (all Cronbach's alphas >0.71). Residents were also surveyed after the OSCE about how prepared they felt and to self-assess performance. Frequencies are reported for specific items and means for summary scores.

RESULTS: Only 2/23 residents introduced themselves using their full name and title and no residents confirmed the identity of patient (name, MR # and DOB). 15/23 residents did not perform check-back technique for medications and dosages. 8/23 identified that metformin should be stopped and explained to the nurse using CUS. Eight residents partially or fully recognized the nurse's mistake in suggesting a change in blood pressure medicine. Almost all residents (21) made some type of interdisciplinary plan with the nurse. The mean IPC Summary Score was 27% well done. While the overall mean communication score for all 11 cases in the OSCE was 74%, the mean communication score specific to the IPC case was 37%. While most residents found the case particularly challenging and complex, 87% (16) of residents felt prepared, 7 thought they could have done better. 4.3% (n=1) received a "not recommend", 30% (n=7) received "recommend with reservations", 43.5% (n=10) received a "recommend" and 21.7% (n=5) received a "highly recommend" rating based on their overall professionalism and ability to work as a member of an inter-professional team.

CONCLUSIONS: Residents vary in their IPC phone skills and therefore Residency IPC curriculum can be targeted and tailored to address demonstrated IPC skills deficits. Given these skills are critical to safe and effective team based patient care, attention needs to be paid to developing feasible, valid assessment techniques to monitor competence in this area.
BACKGROUND: Daily rounds with the attending physician are a central component of medical education for both residents and students in teaching hospitals. However, time for education in this setting can be limited by the demands of patient care. Little is known about the frequency and effectiveness of teaching behaviors on rounds in the current era.

METHODS: We performed a cross-sectional study of attending rounds on general medicine inpatient wards at 4 teaching hospitals. Trained observers accompanied teams on rounds and recorded frequency of educational activities performed by attendings. Students and residents present on the observed day were asked to rate the attending using a Likert scale (1 = strongly disagree to 4 = strongly agree) in response to the statement "Overall, effective teaching occurred on rounds today." The effectiveness of 9 specific teaching behaviors was similarly assessed. We compared the frequency of the specific teaching behaviors with their perceived efficacy. In addition, we grouped attendings into tertiles based on perceived overall teaching effectiveness. Then, we compared the frequency of each observed teaching behavior amongst the three tertiles of attendings using the Kruskal Wallis test.

RESULTS: Overall, 90 rounding episodes were observed including 83 attendings, 279 trainees, and 807 patient encounters. The highest-scoring tertile of attendings scored an average of 3.6 on overall teaching effectiveness, the middle 2.2, and the lowest-ranked 1.2. The highest-ranked attendings performed an average of 2.4 teaching behaviors per patient encounter versus 1.5 in the lowest-scoring group. Significant differences also occurred in the frequency of addressing questions about the patient care plan (77.6% vs 65.9% vs 47%, p = 0.003), providing feedback (31.5% vs 10% vs 0.5%; p = 0.001), and teaching about learner-identified topics (8.0% vs 2.2% vs 1.9%; p = 0.018). There was no significant difference in the frequency of teaching general medical topics, specific evidence-based medicine literature, history-taking, physical examination, or oral presentation skills. The average rounding time per patient was approximately 13 minutes in all 3 groups.

CONCLUSIONS: We found a range of learner satisfaction with teaching from medicine attendings, which may be partially explained by variations in the number and types of teaching behaviors performed. Importantly, the best-ranked teaching attendings performed almost twice as many total teaching behaviors per patient without spending more time rounding. Furthermore, the teaching behaviors that distinguished the highest from the lowest performing attending groups were patient-oriented, such as addressing questions about the patient care plan, and learner-centered, such as giving feedback and teaching about learner-identified topics. In the future, investigators should assess how top-rated attendings are able to perform more teaching behaviors in the same amount of time per patient and whether faculty development efforts aimed at increasing the frequency of patient-oriented and learner-centered teaching behaviors result in better teacher ratings.

Tertiles of attendings are grouped by student and resident rankings of teaching effectiveness (on the particular rounding day they were observed). The boxes represent 25% - 75% with the thick middle line representing the median. The mean is included in the text but not pictured.
THE QUALITY AND IMPORTANCE OF FEEDBACK IN PROFESSIONAL DEVELOPMENT OF INTERNS AND RESIDENTS
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BACKGROUND: The receipt of high quality feedback during medical education is likely a key component of learner development of professional skills, knowledge, and identity. Available literature demonstrates that physicians are often poor at self-assessing their own strengths and weaknesses as clinicians and educators, suggesting that receipt of outside feedback throughout one's career is crucial to continuing professional development. Nonetheless, a paucity of data exists on learner attitudes toward feedback as both recipient and provider.

METHODS: We conducted a structured online survey of internal medicine residents and interns at a moderate-sized academic residency program (Johns Hopkins Bayview Medical Center) to assess the perceived role and importance of feedback in trainees' professional development. Survey questions were developed with a Likert scale model that focused on self-assessed value of several modes of teaching including directed feedback, confidence in giving feedback to individuals at varying levels of training, and importance assigned to feedback giving and receipt in one's future career path.

RESULTS: 19 interns and 15 upper level residents completed the survey. 89.4% (17) of interns deemed one-on-one feedback with faculty members as "useful" or "very useful" for professional development; over 50% of respondents rated this as "very useful." Teaching on rounds, small group sessions, online reference materials, teaching conferences, a module-based internet learning center, and self-directed learning all received lower ratings. In contrast, residents rated online reference materials most consistently as "useful" or "very useful" (100%, 15), while 73.6% (11) of upper level residents rated one-on-one feedback as such. Both interns and residents rated a module-based internet learning resource as the least useful tool in their development. Interns consistently reported a high degree of confidence in providing feedback to students (73.7% agreed or strongly agreed), but generally felt less confidence in providing feedback to fellows and faculty (36.8% each). Residents felt confident in providing feedback to medical students and interns in 73.3% of cases (11 for each), but only 13.3% (2) felt confident providing feedback to fellows and 26.7% (4) to attending physicians. Across the board, the importance of giving and receiving feedback during one's future career was greatly valued; 73.7% (14) of interns and 80.0% (12) of residents strongly agreed that receipt of high quality feedback is important to the doctor they aspire to be in 10 years, while 57.9% (11) of interns and 71.4% (10) of residents strongly agreed that giving high quality feedback is important to the doctor they aspire to be.

CONCLUSIONS: High quality feedback is consistently recognized as playing an important role in professional development among interns and residents, particularly during intern year. While trainees are highly confident in providing feedback to more junior learners, they report low confidence in providing feedback to more senior team members, suggesting that navigation of the cultural hierarchy of medicine remains challenging. Given the importance of feedback to lifelong professional development, further efforts are needed to improve resident training in this skill area.
HIGH VALUE CARE BY US INTERNAL MEDICINE RESIDENTS: USING EXAM VIGNETTES TO ASSESS PRACTICE

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BACKGROUND: Unsustainably high healthcare spending in the US has lead to calls to incorporate high value care (that balances benefits of tests or treatments against potential harms and costs) as a competency for internal medicine residents. However, objective evaluation of resident practice of high value care (HVC) is a challenge for educators. In this study, we describe the development of an assessment of HVC resident practice using a set of clinical vignettes from the Internal Medicine In-Training Examination (IM-ITE).

METHODS: HVC concepts were broadly discussed with IM-ITE authors prior to and during question development. After the exam was finalized, three physicians independently reviewed each of the 340 questions for selection in the HVC subscore and categorized each selected question according to six specific HVC rationales. We measured inter-observer agreement across reviewers for (1) question selection, and (2) the HVC rationale, using Fleiss’ kappa statistic. Exam questions were included in the HVC subscore if, after discussion, the reviewers reached a consensus about both the item and the associated rationale. The IM-ITE exam from which the HVC subscore was defined was administered in October 2012. Using descriptive statistics, we characterized residents' HVC subscore performance according to their year of training, medical school location, residency program track, career plans, overall ITE performance, and the Dartmouth Atlas' hospital care intensity (HCI) index of the training hospital. We used multivariate linear regression with clustering at the program level to identify resident and program characteristics associated with hypothetical practice of HVC, adjusting for overall exam performance and other potential confounders.

RESULTS: Thirty-eight questions were included in the HVC subscore. Initial inter-observer agreement was moderate for question selection (kappa=0.56, 95% CI 0.51-0.58, p<0.001), and fair for HVC rationale (kappa=0.25, 95% CI 0.16-0.26, p<0.001). Of the 18,102 US residents who completed the exam and had a measurable subscore, 34.1% were PGY1, 34.6% were PGY2, and 31.3% were PGY3. About one in five (20.3%) planned to pursue a career in general internal medicine. The mean HCI index of participants' hospitals was slightly higher than the national average (1.12 vs. 1.0, p<0.001). The average percent correct was lower for the HVC subscore compared to the overall exam (60.1% vs 63.1%, p<0.001). The HVC subscore correlated strongly with the overall exam score (Pearson correlation coefficient 0.73, p<0.001). The mean HVC subscore was lower for interns compared to senior residents (20.1 vs. 24.0, p<0.001) and slightly higher for residents who trained at a hospital with below average HCI index compared to those who trained at a hospital with above average HCI index (22.6 vs 22.0, p<0.001). The difference in mean HVC subscores between residents trained at high vs. low HCI index hospitals was more pronounced for residents in lower quintiles of overall exam performance (Table). After adjusting for resident and program characteristics and overall test performance, the HVC subscore was negatively associated with the HCI index of the training hospital (beta coefficient -0.31, p=0.02, 95% CI -0.57 -0.05).

CONCLUSIONS: The process used to develop an HVC subscore of the IM-ITE exam had face validity and resident scores varied slightly based on their home institution's level of healthcare utilization. Although alone it is likely inadequate, this measure may assist in evaluation of resident practice of HVC and may also motivate program directors and residents to focus their learning and curriculum more on high value care principles.

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<th>Mean Subscore for Highest HCI Index Quintile (SD)</th>
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IS TRAINING IN A PRIMARY CARE INTERNAL MEDICINE RESIDENCY PROGRAM ASSOCIATED WITH A CAREER IN PRIMARY CARE MEDICINE? A CROSS SECTIONAL ANALYSIS OF A 10-YEAR COHORT.

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BACKGROUND: Multiple professional and governmental organizations including the Health Resources and Services Administration (HRSA) and the Council on Graduate Medical Education (COGME) have long endorsed primary care residency programs in order to promote a workforce that would ideally be composed of at least 40 percent primary care physicians. In internal medicine, where the vast majority of residency graduates select medical subspecialties, primary care programs are intended to increase the number of graduates selecting and maintaining primary care careers. There is a paucity of data, however, as to whether primary care residency programs are associated with careers in primary care. Our study examines whether enrollment in a primary care internal medicine residency is associated with a career in primary care.

METHODS: We performed a cross-sectional analysis of all internal medicine residency alumni from 2001 through 2010 at a single large academic center via a 27-question survey. Residents at our institution during this period trained in either a traditional categorical internal medicine track, or one of two primary care internal medicine tracks. We used Chi-Square analysis to compare the career outcomes of primary care and categorical residents.

RESULTS: We were able to contact 481 reachable individuals out of a total of 511 living alumni, of which there were 322 respondents (67% response rate) to the survey. We compared 106 responses from primary care residents to the 169 responses from categorical residents and excluded all self-identified current fellows as well as graduates from the basic science residency track. A significantly higher percentage of primary care residents agreed that the majority of their current work is in primary care medicine (54%) as compared to categorical residents (20%) (p<0.001). A significantly higher percentage of primary care residents also agreed that the majority of their current work is with underserved populations (54%) as compared to categorical residents (27%) (p<0.001). While 92.5% of primary care residents agreed or strongly agreed that they were interested in a career in primary care medicine prior to starting residency, only 63% agreed or strongly agreed that they were interested in a career in primary care after residency. Notably, 30 of the 34 residents (88%) who lost interest in a primary care career during residency agreed or strongly agreed that their ambulatory experience during residency influenced their career choice.

CONCLUSIONS: More primary care internal medicine residents practice a primary care career and work with underserved populations than categorical internal medicine residents. This study demonstrates the effectiveness of primary care tracks in internal medicine programs in meeting national workforce goals. A number of primary care residents, however, lose interest in primary care during their residency training. Improving outpatient clinical experiences may be an important factor to further primary care residents' interest in primary care careers.