Clinician-Educators Are More Burned Out as Clinicians Than as Educators: Implications for Teaching (and Practice)

Anne Dembitzer¹, ², Colleen Gillespie², Kathleen Hanley², Ruth Crowe², Sondra Zabar², Nina Yeboah², Audrey Grask², Joseph Nicholson², Adina Kalet², Mark D. Schwartz¹, ² ¹ Dept. of Medicine, NY Harbor VA, New York, NY, United States. ² Dept. of Medicine, NYU School of Medicine, New York, NY, United States. (Control ID: 1335960)

Background: Clinician-educators are the primary teachers of medical students and residents, yet most have not had formal training in medical education. Physician burnout is common and is associated with job turnover and absenteeism, poor morale, and reduced efficiency, and may lead to poorer patient care. As part of a faculty development program (FDP) designed to improve mentoring and teaching skills, we sought to determine the degree of burnout among clinician-educators in an urban, underserved setting, how burnout differed for clinician and educator roles, and the impact of burnout on teaching.

Methods: 30 clinician-educators (CEs) involved in a FDP completed a survey that included the clinician and educator versions of the Maslach burnout inventory. These scales each assess three features of burnout: Emotional Exhaustion, Depersonalization, and Personal Accomplishment, each classified as low, moderate, or high. They rated their perceived competence in five teaching domains (establishing a learning climate, control of session, assessment/evaluation, instructional skills, and giving feedback). They reported on practice characteristics, career fit, job satisfaction, and commitment to lifelong learning (Jefferson Lifelong Learning Scale). Standardized learners assessed clinician-educators’ teaching skills in the same five domains in a three-station Objective Structured Teaching Examination (OSTE). Scores were calculated as percentage of items within each domain rated as Done Well (vs. Not or Partly Done).

Results: More than half of the clinician-educator faculty were internists, the rest were pediatricians or family medicine physicians. They spent an average of 24% (SD 11%) of their time teaching or precepting, 55% of their time providing outpatient care (SD 22%), and 20% of their time providing inpatient care (SD 20%). Burnout scores by clinician and educator roles are shown below (Table). Clinician-educators with high “emotional exhaustion” as clinicians reported lower overall confidence in teaching than did those with only low or moderate emotional exhaustion (one-way ANOVA F=9.91, p=.001, pairwise comparisons p<.05), and this pattern was upheld in the five specific teaching domains as well. Those who reported “high” depersonalization as clinicians were less confident in teaching than were those with only low or moderate scores (one-way ANOVA F=4.51, p=.020, pairwise comparisons p<.05). Commitment to lifelong learning was lower for those with high clinician-related emotional exhaustion (F=7.91, p=.002) and high depersonalization (F=1.967, p=.05), compared to that of those with low or moderate clinician burnout in these areas. Teaching skills in the OSTE did not significantly differ by clinician or educator burnout.

Conclusions: This sample of clinician-educators in urban, underserved settings had a higher rate of burnout as clinicians than as educators. Burnout as a clinician may impact one’s effectiveness as an educator since clinically burned-out faculty had less confidence in their teaching skills and fewer lifelong learning habits. This study suggests the need to further investigate how clinician-educators balance the demands and effects of their dual roles.
Checkbook: Improving Cost Awareness through Audit and Feedback

Jason Post\textsuperscript{1}, Darcy Reed\textsuperscript{1}, Andrew J. Halvorsen\textsuperscript{1}, Furman S. McDonald\textsuperscript{1,1} Department of Medicine, Mayo Clinic, Rochester, MN, United States. (Control ID: 1336601)

Background: Rising healthcare costs have created an urgent need to improve physicians’ education regarding cost and value in healthcare. The ACGME core competency of systems-based practice encompasses cost awareness and risk-benefit analysis, but there has recently been a call to expand this to create a new, seventh core competency of high-value, cost-conscious care. We set out to determine if audit and feedback would improve resident attitude and knowledge regarding costs of commonly ordered tests.

Methods: We developed an electronic audit and feedback tool called “Checkbook” which provides data on costs and charges for patients cared for at Mayo Clinic-Rochester. This tool allows modeling of healthcare costs and charges by adding or deleting tests and services to the “bill”. We conducted a pre-post analysis of the effect of Checkbook on residents’ knowledge and attitudes of healthcare costs. First, we asked 48 first and 48 third year residents to estimate charges for commonly ordered tests and services, and surveyed their attitudes regarding cost. Residents then used Checkbook to examine billing data from three hospitalized patients for whom they personally provided care. Residents reflected upon which, if any, tests or services may have been avoidable. Following the Checkbook exercise, residents completed an identical post-test of knowledge and attitudes. Pre and post study results were compared using paired t-tests.

Results: Forty-three PGY-1 (89.5%) and 40 PGY-3 (83.3%) residents completed the Checkbook exercise. Post-test data showed improvement in estimates of charge as measured by percentage error for commonly ordered tests and services including electrolyte panel (mean percentage error 83.1\% vs 13.4\%, p<0.0001), serum calcium (17.2\% vs 12.0\%, p=0.006), chest x-ray (324.6\% vs 128.9\%, p=0.003), ECG (38.5\% vs 9.5\%, p=0.001), and a one-night hospital stay (35.0\% vs 3.6\%, p=0.01). Less commonly ordered tests such as abdominal CT and head MRI did not show an improvement in accuracy of charge estimate. After using Checkbook, both PGY-1 and PGY-3 residents were more likely to agree that they knew the costs of common tests (PGY-1: 2.7\% vs. 27\%, p=0.003; PGY-3: 9.7\% vs. 41.9\%, p=0.002) and that they had received adequate education regarding cost of care (PGY-1: 2.7\% vs. 51.4\%, p=<0.001; PGY-3: 0\% vs. 32.3\%, p=0.002). PGY-1 residents were more likely to agree that cost influenced their ordering decisions (37.8\% vs 67.6\%, p=0.005), that their supervising physicians encouraged them to consider cost when ordering tests (24.3\% vs 46\%, p=0.01), and that they had adequate access to the costs of care that they provide (5.4\% vs 54.1\%, p<0.001).

Conclusions: This study shows that chart audit and feedback with the aid of a cost/charge calculator reflection tool improves residents’ knowledge and attitudes regarding costs of care. Previous studies have shown improvement in knowledge of costs using different methods, but to our knowledge this study is the first to demonstrate this using audit and feedback with actual patient cost and charge data. Reflecting upon actual costs of care is an important component of curricula teaching high-value, cost-conscious care.
E-learning and Deliberate Practice for Oral Case Presentation Skills: A Randomized Trial

Heather L. Heiman1, 2, Toshiko Uchida1, 2, Craig Adams4, John Butter1, 2, Elaine Cohen1, Stephen D. Persell1, Paul Pribaz4, William C. McGaghie3, Gary J. Martin1 Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL, United States. 2 Augusta Webster Office of Medical Education and Faculty Development, Northwestern University Feinberg School of Medicine, Chicago, IL, United States. 3 Center for Education in Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL, United States. 4 Simulation Technology and Immersive Learning, Northwestern University Feinberg School of Medicine, Chicago, IL, United States. (Control ID: 1338669)

Background: The oral case presentation is an essential clinical skill. A competent presentation allows for efficient transfer of information between providers, and it permits evaluation of students’ clinical reasoning. Medical students express anxiety about their oral presentation skills. They seek a rule-based structure to use in developing their presentations. We therefore aimed to develop and rigorously evaluate an oral presentations curriculum using on-line learning and deliberate practice to better prepare second year medical students for clinical clerkships.

Methods: We developed a web-based, interactive oral presentation curriculum emphasizing conciseness and clinical reasoning. The curriculum consists of two components: 1) an on-line, interactive module followed by 2) deliberate practice of case presentations with detailed checklist-based feedback from a fourth-year medical student coach. To permit standardized feedback and assessment, we created a set of video cases with accompanying written physical exam reports for students to use as the basis for their presentations. Chief concerns for all cases were common primary care symptoms. Using a waitlist control design, groups of second year students were randomly assigned to receive the curriculum in December 2010 (intervention group) or in April 2011 (waitlist control group). Medical students completed presentation assessments at baseline, at a midpoint when half had taken the curriculum, and at a final point when all students had taken the curriculum. Performance of a class of students who did not receive the curriculum was also examined as a historical comparison.

Results: One hundred thirty-two second-year medical students (67 in the intervention group and 65 in the waitlist control group) were evaluated at the three time points. At the midpoint evaluation, mean scores of the intervention students improved from 60.2% to 70.1%, while scores of the waitlist control students improved from 61.8% to 64.5% (p<0.01 for between-group difference in improvement). At the final evaluation, the mean scores for the intervention and waitlist control students rose to 77.8% and 78.4%, respectively, as compared to 68.1% for the 142 untrained comparison students (p < 0.0001 compared to all curriculum students). Inter-rater reliability across the content portions of the checklists was substantial at 0.73 (range 0.61-0.81).

Conclusions: This study demonstrates that a curriculum of online learning followed by deliberate practice improved performance on a reliable assessment of oral presentation skills. The curriculum is sustainable, potentially exportable, and can be used to ensure that early medical students demonstrate competence in the case presentation before moving to the clinical environment.
Expectations of iPad use in an internal medicine residency program: Is it worth the “Hype”?  

Nancy Luo1, Bhakti Patel2, Christopher G. Chapman1, James Woodruff1, Vineet Arora1 1  Department of Medicine, University of Chicago Medical Center, Chicago, IL, United States. 2 Department of Pulmonary/Critical Care, University of Chicago Medical Center, Chicago, IL, United States. (Control ID: 1339342)

Background: Hospitals and residency programs are increasingly looking to mobile computing to enhance physician efficiency and improve patient experience. While anecdotal reports highlight its benefits, introduction of any new technology in the workplace could result in an “inflated peak of expectations” according to the Gartner Hype Cycle. Few studies examine this phenomenon. The aim of the study is to compare expectations of use of an iPad among residents in a teaching hospital with perceptions after deployment.

Methods: One-hundred and fifteen internal medicine residents were given Apple iPadsTM (Cupertino, CA) with access to the electronic medical record (EMR) [EpicTM (Verona, WI)] via Citrix client in October of 2010. Residents were surveyed in the month prior and four months after deployment of iPads to assess the potential impact on their workflow and efficiency. Questions used a five-point Likert scale to assess excitement, anticipated and actual use, as well as barriers to use in terms of portability and user interface. Data were merged in Excel, and Pearson’s chi squared tests were performed to assess for differences before and after iPad deployment.

Results: Ninety-nine percent (114/115) of residents completed a matched pre- and post-deployment survey. Most residents [78%] reported using the iPad during the call day. After deployment of the iPad, fewer residents reported spending time looking for a computer (16% post vs 65% pre, p<0.0001) and waiting for a computer to log into the EMR (30% post vs 63% pre, p<0.0001). Interestingly, while most residents before deployment believed that the iPad would improve attendance at educational conferences, patient care, and efficiency on the wards, there were fewer residents who ‘strongly agreed’ with each of these statements after deployment of the iPads (17% post vs 44% pre, p<0.0001 for education; 15% post vs 34% pre, p=0.009 for patient care; 24% post vs 41% pre, p=0.034 for efficiency). The biggest barriers to why residents did not use their iPad more were: difficult to type (47%), cumbersome to carry (42%), wireless access point (e.g. “hotspot”) connection delay (37%), and slow user interface of the EMR on the iPad (32%). Surprisingly, compared to before deployment, more residents reported after deployment of the iPad that they preferred pen and paper to organize their thoughts (67% post vs 39% pre, p<0.001). In spite of this, 84% of residents thought the iPad was a good investment for the residency program, and over half of residents (58%) reported that patients commented on the iPad in a positive way. After using the iPads for 4 months, more residents agreed with the statement “[the iPad] has changed my life” (16% post vs 6% pre, p=0.02).

Conclusions: While the use of mobile computing devices like the iPad is associated with improved efficiency among internal medicine residents and is generally well-received by residents and patients, the high initial expectations of the iPad highlight the danger of implementing new technologies. Here, we show inflated expectations specifically in the areas of education, patient care, and efficiency, in addition to a stronger preference for pen and paper after the iPad. For those considering deployment of mobile devices, it is important to consider how to manage initial expectations to avoid the ‘trough of disillusionment’ and maximize the adoption of new technologies.
A Randomized Controlled Trial of the Feasibility of a Protected Sleep Period for Medical Interns in the Hospital for Prolonged Duty

Laurie Norton¹,², Kevin G. Volpp¹,², Judy A. Shea³,¹, Jingsan Zhu¹,³, Dylan Small⁴,¹, Mathias Basner⁵, Adrian Ecker³, David Dinges⁵, Daniel Mollicone⁶, Cristina Novak¹,², Lisa Bellini³,¹ Leonard Davis Institute Center for Health Incentives and Behavioral Economics, University of Pennsylvania, Philadelphia, PA, United States. ² Center for Health Equity Research & Promotion, Philadelphia VA Medical Center, Philadelphia, PA, United States. ³ Department of Medicine, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, United States. ⁴ Department of Statistics, the Wharton School, University of Pennsylvania, Philadelphia, PA, United States. ⁵ Division of Sleep and Chronobiology, Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, United States. ⁶ Pulsar Informatics, Philadelphia, PA, United States. (Control ID: 1340423)

Background: In 2008 an Institute of Medicine Report recommended protected sleep periods for medicine trainees on extended overnight shifts, a position reinforced in recent ACGME requirements. We evaluated the feasibility and consequences of mandatory naps during extended duty.

Methods: 4-week blocks at the Philadelphia VA Medical Center (PVAMC) medicine service and at the Hospital of the University of Pennsylvania (HUP) oncology service were randomly assigned to either a standard intern schedule (extended duty overnight shifts of up to 30 hours), or ‘mandatory naps’ (interns given protected time from 00:30-05:30 to sign out their cell phones and sleep). Study participants were asked to wear wrist actiwatches, complete sleep diaries, and perform daily Psychomotor Vigilance Tests (PVT-B) to measure behavioral alertness.

Results: On 98.3% of intern on call nights, cell phones were signed out to residents as designed. Mean sleep time during the protected period at PVAMC was 2.6 hours in the intervention months compared with 1.6 in the control months (p-value <0.0001). At HUP, mean sleep time was 2.8 hours in the intervention months and 1.9 hours in the control (p-value <0.0001). Interns with mandatory naps were less likely to have on call nights with no sleep at both sites (PVAMC: 12.5% vs. 26.9%, p-value <0.0001; HUP: 11.1% vs. 17.1%, p-value 0.04). In contrast 20.7% of interns during intervention months slept 4-5 hours during the protected period compared with 6.6% during control months at PVAMC (p-value <0.001) and at HUP, 27.6% vs. 8.0%, (p-value <0.001). At both HUP and PVAMC, response speed on the PVT-B was significantly faster after on-call nights in the intervention relative to the control group (PVAMC: 4.07 vs. 3.84 per second (s)-¹, p-value 0.021; HUP: 4.04 vs. 3.89 s-¹, p-value 0.016), and the number of lapses of attention was lower, albeit not significantly at HUP (PVAMC: 3.88 vs. 5.72, p-value 0.031; HUP: 3.95 vs. 4.73, p-value 0.059).

Conclusions: This study provides the first evidence that a mandatory program of “protected time for sleep on extended duty shifts” is feasible with high rates of adherence and that it can produce a significant increase in mean hours slept and an increase in behavioral alertness on mornings after overnight shifts. While there is evidence that obtaining nap sleep (relative to no sleep) during prolonged duty helps reduce fatigue, it remains to be determined whether the gain in sleep time and alertness afforded by a mandatory protected nap reduces fatigue-related errors and accidents involving residents. Protected nap periods are feasible and improve alertness, suggesting they may provide a reasonable alternative to mandated shorter shifts.
Background: Amid America's primary care crisis, the percentage of internal medicine trainees entering general internal medicine (GIM) has been declining. Many believe that improving resident continuity clinic could increase interest in GIM. This study assessed which elements of resident clinic may influence pursuing employment in GIM.

Methods: Surveys were administered at the end of the academic year to all 250 internal medicine residents with continuity clinic at 3 programs: Temple University School of Medicine, Mount Sinai School of Medicine, and Johns Hopkins Bayview Medical Center. The survey was a modified and re-validated version of the VA Learners Perception Survey, assessing, across a 4-point Likert scale, satisfaction with 32 clinic elements, grouped into 6 domains: (1) clinical preceptors, (2) educational environment, (3) ancillary staff, (4) time management, (5) clinic records and space, and (6) personal experience. Each respondent was also asked to rate the likelihood that they would "consider a future employment opportunity in GIM" (1) before their continuity clinic experience and (2) as a result of their continuity clinic experience. Bivariate analyses were performed between each clinic element and whether the respondent was likely vs. unlikely to pursue GIM as a result of continuity clinic. A generalized estimating equation was used for multivariate analysis.

Results: 225 (90%) residents, evenly distributed across training year and gender, completed surveys. 48% were likely to enter GIM before continuity clinic; 38% as a result of continuity clinic. On average, 83% were satisfied or very satisfied with the 32 clinic elements, with highest ratings for the clinical preceptor domain (96% satisfied or very satisfied) and lowest for the time management domain (66% satisfied or very satisfied). Bivariate analyses showed significant differences (p < 0.002) between those likely vs. unlikely to enter GIM as a result of clinic, in the percentage of those "very satisfied" with 6 of 32 clinical elements: faculty mentorship (76% vs. 53%), time for patients (29% vs. 11%), number of patients (76% vs. 34%), personal reward from work (52% vs. 23%), relationship with patients (64% vs. 42%), and continuity with patients (57% vs. 32%). Being likely to enter GIM before clinic (OR 29.2, CI 20.8-41.2) and being "very satisfied" with the continuity of relationships with patients (OR 3.04, CI 1.79-5.15) were the strongest independent predictors of being likely to enter GIM as a result of clinic in the multivariate analysis.

Conclusions: Across 3 internal medicine training programs, resident satisfaction with most aspects of continuity clinic was high; yet, continuity clinic appeared to have an overall negative influence on residents' attitudes towards GIM careers. While it is likely that increasing interest in GIM before trainees begin residency would have the greatest impact on increasing the number of trainees who choose GIM careers, there is potential to increase interest in GIM by improving residents' continuity with patients and time management skills in resident continuity clinic.