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Proceedings of the 2013 Society of Teachers of Family Medicine (STFM) Conference on Medical Student Education

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Proceedings of the 2013 Society of Teachers of Family Medicine (STFM) Conference on Medical Student Education

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The Society of Teachers of Family Medicine (STFM; http://www.stfm.org) is a community of professionals devoted to teaching family medicine through undergraduate, graduate, and continuing medical education. This multidisciplinary group of physicians, educators, behavioral scientists, and researchers works to further STFM’s mission of improving the health of all people through education, research, patient care, and advocacy. The STFM held its 39th Conference on Medical Student Education in San Antonio, Texas, from January 24 to 27, 2013. Steven Berk, MD, and Betsy Goebel Jones, EdD, of the Texas Tech University Health Sciences Center opened the conference with a look at an innovative way to expand the primary care physician workforce: the accelerated track. Throughout the conference, the more than 430 participants shared ideas and learned new skills in numerous workshops, seminars, and discussions as well as educational research and curriculum evaluation papers, and poster presentations. Andrew Bazemore, MD, MPH, director of the Robert Graham Center for Policy Studies in Primary Care, closed the conference with a joint presentation to STFM and the Society of Student Run Free Clinics. Dr. Bazemore spoke of the need and the opportunities to advance and transform the U.S. primary care function. The STFM Education Committee selected 10 papers from the educational research and curriculum evaluation papers, felt to be of interest to readers of Teaching and Learning in Medicine. Two of the papers deal with preclerkship education, 2 with 3rd- and 4th-year education, 3 with longitudinal experiences across all years of medical school, and 3 with assessment.

PRECLERKSHIP EDUCATION

Simultaneous Auscultation using Electronic Stethoscopes and Mobile Applications for Community-Based Medical Student Education

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Introduction: Auscultation skills are difficult to master. Trainees rank confidence in auscultation lower than other physical examination skills. Medical educators must develop methods to improve auscultation skills. Electronic stethoscopes and mobile applications allow up to 5 stethoscopes to simultaneously transmit auscultation findings. The lead stethoscope acquires acoustic information and wirelessly sends it to the mobile device. The mobile device sends information to listening stethoscopes. Simultaneous auscultation allowed by these devices has potential to improve education by addressing the inherent uncertainty in solo auscultation. This project evaluated the effectiveness and utility of electronic stethoscopes and a mobile application (devices) for community-based medical student education.

Methods: The study institution has 11 geographically diverse community campuses (CCs) at Federally Qualified Health Centers. Physician educators at 6 CCs were enrolled. Five CCs were control sites. Educators used the devices in classrooms and clinics with 54 second-year medical students (MS2) at 6 study sites from January to May 2012. Students and participating preceptors used the devices when seeing patients, as part of their routine clinic experience. In the clinic the students and participating preceptors used the devices while assessing patients, as part of their routine clinic experience. There were 50 MS2s at 5 control sites. Students spent 1 day per week with community-based physicians. Students took a pre- and poststudy heart sound quiz consisting of a 10-item audio test. Both students and preceptors completed pre- and postsurveys. Mixed-model analyses of variance were used to compare...
An Evaluation of Student Preferences and Performance on Active and Passive Online Learning Modules

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Introduction: Students’ preferences for online learning formats are unknown. We sought to evaluate whether students preferred online lectures or active learning exercises and if either format was associated with increased learning gains.

Methods: During a required neurological sciences course, 1st-year medical students completed 7 online modules covering core content of the course. Each module began with a pretest. Students then chose between (a) an online PowerPoint lecture with audio commentary and (b) an active learning exercise. The active learning exercises required students to draw diagrams, figures, or tables; answer short-essay questions; or use interactive online simulation tools designed to cover the same content found in the lecture. Following the lecture or activity, students completed a posttest and had the option to complete the other learning option.

Results: There were no significant differences between study and control group mean quiz scores. Prestudy, study, and control site students combined reported being unsure of auscultation findings (86%) and acting like they heard when uncertain (32%). With simultaneous auscultation, students reported improved certainty of hearing auscultation findings. Not all study site students had participating preceptors. Of the 54 study students, 25 reported using the devices with preceptors at least “some of the time” and were categorized as the “clinic users.” Of these, 84% agreed “When I used the devices in clinic I was able to know with certainty I heard correctly.” Further, 80% of clinic users agreed they had more confidence in auscultation with use. The frequency of student use of devices with preceptors was positively correlated with student agreement with “more certainty” and “more confidence” in auscultation (p < .01).

Conclusions: Simultaneous auscultation can provide perceived value to students. Although there was no difference in mean quiz scores, use of these devices promoted increased student confidence and certainty in auscultation during preceptor–student clinical interactions.

REFERENCE
fmCASES online virtual learning may impact student satisfaction, attention to and participation in other course elements, and exam and nonexam performance. Our objective was to identify whether and to what degree these trade-offs exist to understand how this new technology produces unanticipated changes to the student learning environment.

**Methods:** We examined a 3-year period of our curriculum spanning prior to and after the introduction of a set of required fmCASES. Aside from replacing the traditional textbook with online cases, all elements of the clerkship remained constant. Didactic sessions focused primarily on clinical skill acquisition, review of chronic disease management, culture-based care considerations, policy, and two acute care topics. Quantitative student and program evaluation instruments were portfolio based, including examination, attendance and participation, evidence-based medicine (EBM) assignment, preceptor evaluation, and course satisfaction and satisfaction with fmCASES. Time spent on cases was reported by InTime in the aggregate and could not be statistically tested. All other scores were provided as discrete scores. Data were recorded in a database and analyzed with SAS for difference in means for statistical significance using student t tests. The University of Pennsylvania Institutional Review Board considered this study protocol exempt from formal review.

**Results:** Student academic credentials at entrance of medical school and demographic characteristics were similar for the 3 years studied (n = 513). When comparing the baseline year of 2010 to 2012, students spent an increasing amount of time on online cases (M = 43.3 vs. 53.7) Overall course satisfaction as measured using a 5-point scale was unchanged over the study period, whereas online case satisfaction declined (3.76 vs. 3.38, p = .01). Overall course performance, total exam score, and preceptor clinical score did not change. Performance on a 10-point EBM assignment improved (7.6 vs. 7.9, p = .04). Didactic attendance score of 5 possible points improved (4.96 vs. 5.0, p = .002), whereas participation declined (4.26 vs. 4.05, p = .03).

**Conclusions:** Students spent increasing time in online case review when participation is required though satisfaction with those cases declines. This did not impact course satisfaction. Although EBM is not directly addressed by fmCASES, there was nonetheless an unexpected benefit to the change from textbook to online cases. This may be due to shorter time to publication of online cases over traditional textbook. Finally, although attendance in didactics improved, participation declined, which may indicate that online cases distract students from face-to-face learning. Although fmCASES improved EBM performance and did not change clinical performance, there were statistically significant trade-offs in learning methods.

**Community Preceptor Payment for Teaching: Results from the 2012 CERA Survey of Clerkship Directors**

**Introduction:** Family medicine clerkships depend heavily on community-based family physician preceptors to teach medical students. Although community preceptors have traditionally been unpaid, recent evidence has suggested an increase in the number of clerkship directors who pay their community preceptors as well as increased concerns about potential detrimental effects of such payments. This survey was conducted to determine (a) trends in the number and geographic region of programs that pay their community preceptors, (b) reasons programs pay or do not pay, and (c) advantages and disadvantages of payment.

**Methods:** This study was part of an omnibus survey administered by the Council of Academic Family Medicine Educational Research Alliance sent to 134 Family Medicine clerkship directors at allopathic U.S. medical schools between July and September 2012. Chi-square test statistics were used. The study was approved by the American Academy of Family Physicians Institutional Review Board.

**Results:** The response rate was 62% (83/134 clerkship directors). Nineteen (23%) currently pay community preceptors; eleven are located in either New England or the South Atlantic region. Preceptor payment ranged from $20 to $500/week/student (Mdn = $170/week/student). Sixty-three percent of programs who pay reported that their community preceptors are also paid for teaching other learners (e.g., non-LCME medical students from non-LCME/AOA medical schools), compared to 32% of those programs who do not pay.
(p = .02). Paying respondents displayed more positive attitudes toward paying community preceptors, and a majority of non-paying respondents indicated they would pay if they had the financial resources.

Conclusions: A minority of clerkships pay their community preceptors to teach medical students, and competition from other learners may drive more medical schools to consider payment to help with preceptor recruitment and retention. Medical schools located in regions where there is competition for community preceptors from other medical and nonmedical schools may need to consider paying preceptors as part of recruitment and retention efforts.

REFERENCES

LONGITUDINAL EXPERIENCES
Student Perceptions of the Patient-Centered Medical Home

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Introduction: The patient-centered medical home (PCMH) model has gained traction within the federal government and payors; however, it is unknown if medical students have sufficient knowledge and a positive perception of PCMH. This project was designed to gain a national perspective on the knowledge and perception of PCMH that students potentially interested in family medicine possess.

Methods: In summer 2011, the American Academy of Family Physicians (AAFP) surveyed medical students to assess their knowledge of and attitudes toward the PCMH model of care. Two populations were electronically surveyed: a simple random sample of all AAFP student members (n = 345) and attendees of the 2011 AAFP National Conference of Family Medicine Residents and Students (n = 154). The survey for the sample of all student members (“student respondents”) was distributed prior to National Conference; the survey of attendees followed National Conference in August 2011. Only 3 respondents completed both surveys; no matched comparisons were conducted, and the 2 populations were treated as mutually exclusive groups. Z tests for proportions were run to determine statistically significant differences between the two response groups. This study received exempt status by the Institutional Review Board.

Results: Forty-five percent of student respondents reported having a strong or very strong understanding of PCMH. National Conference attendees (66%) were significantly more likely than nonattendees (45%) to indicate understanding of PCMH (p < .05). Nearly 3 out of 4 (74%) student respondents indicated learning about PCMH from colleagues, teachers, or mentors, and more than half (55%) learned PCMH principles from classroom lectures. Ninety-four percent of medical students ranked teamwork with nurses, social workers, and dieticians highest importance, whereas only 62% ranked allowing nonphysicians to manage patients highest importance. Although more than three fourths (77%) indicated that evening and weekend hours were important, only 46% considered e-visits important. Most students (78% respondents, 91% attendees) indicated that PCMH had a positive impact on their views of family medicine and the health care system as a whole.

Conclusion: The survey addressed where students obtain information about clinical innovation. Overall, PCMH was viewed very positively, with students indicating a strong or very strong understanding of PCMH principles. Faculty interaction with students, both in didactics and more informal settings, impacts students’ understanding of PCMH. Although students value ancillary personnel in teams, more work is needed teaching medical students the value of interprofessional teamwork with nurse practitioners and physician assistants. This information may allow faculty to focus their teaching on specific aspects of PCMH in the family medicine clerkship or other components of medical education.

Measuring the Overall Quality of Well-Being of Patients at Student-Run Free Clinics

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Introduction: Many medical schools have Student-Run Free Clinics (SRFC), but Health-Related Quality of Life (HRQoL) has not been studied in these settings. The self-administered Quality of Well-Being (QWB-SA) scale, a validated HRQoL index that measures well-being from 0.0 (death) to 1.0 (asymptomatic full function), was used to evaluate HRQoL at a SRFC.

Methods: This was an Institutional Review Board–approved multisite prospective longitudinal study. University of California, San Diego Student-Run Free Clinic Project (UCSD SRFCP) patients from three sites completed QWB-SAs during clinic visits between January 2003 and July 2011 (N = 1,573). Baseline QWB-SAs were collected and follow-up surveys were conducted at varying intervals of at least 1 month for the first follow-up survey and at least 3 months for subsequent surveys. Baseline scores were compared using independent-sample t tests and one-way analysis of variance. Baseline QWB-SA scores of UCSD SRFCP patients were compared with published scores from other general medical clinics1 and differences were assumed to be significant if greater than the generally accepted minimal clinically important difference of 0.03.2 Of patients who completed at least four QWB-SAs (N = 316), baseline was compared to subsequent visits using paired t tests.

Results: The mean baseline QWB-SA score was 0.587. Male and female participants scored similarly (0.593 male vs. 0.583 female, p = .265). Scores decreased with age and varied by ethnicity and education level. Housing status exhibited the greatest difference (0.544 homeless vs. 0.605 housed, p < .05). UCSD SRFCP baseline patient scores were lower than those published for age-matched patients at general outpatient clinics1 (0.624 vs. 0.670 for ages ≤ 30 years old, 0.619 vs. 0.643 for ages 31–40, 0.570 vs. 0.602 for ages 41–50, 0.564 vs. 0.616 for ages 51–60, 0.580 vs. 0.616 for ages 61–70, and 0.559 vs. 0.608 for ages ≥ 71). Mean scores of SRFCP patients who completed at least 4 QWB-SAs improved from 0.588 at baseline to 0.613 with second follow-up (p = .002), 0.624 with third follow-up (p < .001), and 0.613 with fourth follow-up (p = .002).

Conclusions: UCSD SRFCP patient QWB-SA scores demonstrated expected patterns based on age and demographic factors. Baseline HRQoL scores in this setting were lower than those seen in general outpatient clinics, likely reflecting the underserved nature of populations seen in SRFCs. Homeless patients scored lower than housed patients supporting the belief that social determinants of health and socioeconomic status impact quality of life. HRQoL increased over time in patients receiving care at the SRFCP, suggesting that SRFCs may play a role in improving patients’ overall sense of well-being.

Acknowledgments: William Y. Chen and Sunny Smith contributed equally to this work.

REFERENCES

Patient Satisfaction With the Interprofessional Teaching Clinic
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Introduction: In the spring of 2011, two national reports recommended establishing Interprofessional (IP) education competencies.1,2 Although specific competencies have been established, silos still exist in education and practice. There is a call for increased IP training models in health profession education and specifically in primary care.3 At our institution, the Interprofessional Teaching Clinic was developed in partnership with the Schools of Medicine, Nursing, Pharmacy and Health Professions. Patient care is facilitated by IP student teams. It is unknown how patients perceive IP student teams at the point of care. As a quality improvement project, patients were surveyed on their satisfaction with this training model.

Methods: A 14-item survey was developed using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Patients were asked to complete the paper survey after their encounter in the Interprofessional Teaching Clinic over a 2-week period. Survey responses remained anonymous. Descriptive analysis included both the frequency of responses per question and the average rating per question. Average overall patient satisfaction was correlated with each question.

Results: The response rate was 50% (50 of 100 patients). Ninety percent of respondents agreed that they were completely, if not very, satisfied with the experience. Eighty percent agreed with the statement “I felt that having a team of students improved my care.” Seventy-two percent of respondents disagreed with the statement “It was difficult to talk about my medical problems because the team of students was there.” Twenty-five percent, however, agreed that more than one student is too many. Patient satisfaction was positively correlated (.360) with the patients’ perception that the students introduced themselves.
Conclusions: The majority of respondents reported satisfaction with the care provided by IP student teams. One fourth of patients surveyed, however, indicated that more than one student is too many. Study limitations include short length of time for survey distribution and a response rate at 50%. More study is warranted to better understand if IP encounters address patient needs differently, and if so, whether patient satisfaction is linked to the perception that real needs are being met.

REFERENCES

ASSESSMENT
fmCASES National Exam: Correlations With Student Performance Across Eight Family Medicine Clerkships

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Introduction: fmCASES is a set of online virtual patient cases, designed to address the Society of Teachers of Family Medicine’s (STFM) National Clerkship Curriculum objectives. A fmCASES National Exam consisting of multiple-choice questions (MCQ) was created to test student acquisition of knowledge representative of this nationally recommended content. This study correlated student performance on the fmCASES National Exam with time of year, case completion, and length of clerkship.

Methods: Created by a writing group of 10 STFM educators, the MCQs were field-tested during academic year 2010–11. Only questions with a difficulty index between 40% and 97% and a positive discrimination index were included during the study year 2011–12. Two versions of the exam were created with comparable representation across cases and content areas. Each test version went to one half of the study schools. Only data from students taking the exam for the first time were included. “Case completion” required a minimum amount of time, number of cards accessed, and interaction with the case’s questions. All participating schools received Institutional Review Board approval for this study. We analyzed the data through descriptive statistics, including exam score average and standard deviation, and test reliability. We examined correlations between exam score and case completion, weeks since start of the school year, and clerkship duration. A logistic regression model examined the relationship between high scores (greater than 1 SD above mean) and case completion.

Results: The MCQ final exam contributed similarly to the students’ final grades at all schools. The number of cases required at the schools ranged from 0 to 40. Duration of the family medicine clerkship ranged from 4 to 8 weeks. There were 433 students who took Version A, with a mean of 73.13% (SD = 6.53), and 736 students completed Version B, with a mean of 73.98% (SD = 7.32). Test reliability was 0.66 and 0.73 for Versions A and B, respectively. Case completion was statistically and strongly correlated with exam score (0.25245, p < .0001). Weeks since the start of the school year also correlated
Introduction: Students perform better with feedback and associate feedback with high-quality teaching, but students often report insufficient feedback. Student assessments of feedback and teaching effectiveness are commonly solicited only at the end of a clerkship. When students encounter multiple preceptors, a single summative assessment may be inadequate. This project aimed to isolate the effect of repeated assessment on overall assessment of clinical teaching while increasing the data available for evaluation and development of faculty.

Methods: A per-clinic session assessment of clinical teaching was developed through stakeholder meetings and pilot testing. It consisted of an online form tied to the required daily patient log. It was designed to be completed in less than 1 min, composed of 1 global and 7 Likert scale items, and fields for comments on strengths and weaknesses. With Institutional Review Board approval, data were collected at 16 family medicine clerkship sites, from 70 students in the first half of 2011–2012 (before implementation) and 84 students over the same period of 2012–2013 (after implementation). Student t tests compared summative student ratings of preceptor feedback and teaching effectiveness. Linear regression evaluated the correlation between repeated measures and summative ratings.

Results: In the first half of 2012–2013, a median of 27.5 assessments were completed at each site. Summative ratings of feedback and teaching effectiveness did not change significantly from year to year (ΔM = −0.075, 0.034; p = .68, .81, respectively); repeated measures of effective teaching (M = 4.619) were moderately correlated with the summative ratings (M = 4.553, r² = 0.56, p = .001).

Conclusion: Repeated assessment did not impact summative ratings of feedback and teaching effectiveness. We anticipated improved ratings due to faculty awareness of being observed. The absence of an effect allows us to continue using repeated measures to increase data available for faculty development with little concern of biasing summative ratings.

Impact of Frequent Assessment on Student Ratings of Preceptor Feedback and Clinical Teaching Effectiveness

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Introduction: Students perform better with feedback and associate feedback with high-quality teaching, but students often report insufficient feedback. Student assessments of feedback and teaching effectiveness are commonly solicited only at the end of a clerkship. When students encounter multiple preceptors, a single summative assessment may be inadequate. This project aimed to isolate the effect of repeated assessment on overall assessment of clinical teaching while increasing the data available for evaluation and development of faculty.

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Results of a Web-Based Patient Log Detailing Clinical Experience of FM Clerkship Compared to All Clerkships

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Introduction: A web-based patient log was created in 2008 at one medical school, with consensus among all 3rd-year clerkships around content and design. This was done in response to Liaison Committee on Medical Education accreditation standards and our school’s desire to have more central oversight. There are three categories of entries—diagnoses/symptoms,
skills, and special domains. Each clerkship determines specific minimal requirements. This tool allows efficient and real-time tracking of student's progress in meeting requirements.

Methods: Three years of patient log data were analyzed including patient demographics, clinical settings where patients are seen, number of patients logged by each student, and distribution of diagnoses/symptoms, skills, and special domains. Institutional Review Board approval was obtained for this study.

Results: For combined all clerkships, the age distribution remained steady across the 3 years, with peaks in patients ages 16 to 45 (33% of all patients seen) and ages 46 to 64 (22% of all patients seen). The majority of clinical experience during the 3rd year was in the outpatient clinic setting (60%) with inpatient wards comprising 25%. Family medicine students entered an average of 100 patients per student, the highest of any clerkship. Rural track family medicine students logged even more, with an average of 150 patients per student. More than 90% of family medicine patients are seen in the outpatient clinic, whereas 5% are inpatient. The top 6 diagnostic/symptom categories seen on the Family Medicine clerkship were cardiovascular; musculoskeletal; respiratory; endocrine; eye, ear, nose, and throat; and central nervous system. The most common type of visit was acute limited (as opposed to acute serious, chronic diagnoses, or preventive). For family medicine students, gender distribution of patients seen was 60% female, 40% male with significant preceptor specific variability.

Conclusions: The web-based patient log provides a 3-year picture of the clinical educational experience of students on their 3rd-year family medicine clerkship. Logging patient experiences across all clerkships of the 3rd year allows tracking of progress toward meeting requirements for each clerkship and achieving the objective of comparable clinical experiences across sites.