Session CUF

Update in Medical Education
SGIM 34th Annual Meeting
Phoenix, AZ

May 5, 2011
4:00 – 5:30pm

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Articles

The Update in Medical Education is a review of medical education articles published in 2010. Articles reviewed and summarized in the handout were identified through handsearches of the tables of contents of selected journals and through a targeted search in PubMed for medical education articles. Articles were selected based on criteria of relevance to the GIM audience, potential to impact practice, study design, educational innovation and overall study quality.

The articles summarized in this handout are listed below.


Sah S, Loewenstein G. Effect of reminders of personal sacrifice and suggested rationalizations on residents' self-reported willingness to accept gifts: a randomized trial. JAMA 2010 Sep 15;304(11). PubMed PMID: 20841534


Summary: This study sought to compare the effect of preceptors with process expertise to those with content expertise on medical students’ learning outcomes in a small group environment at one institution. 151 first year medical students in the Cardiovascular/Respiratory course at the University of Calgary were randomly assigned to a small group facilitated exclusively by content experts, process experts or by a mixture of both. Process experts’ teaching was rated higher by students than content experts’ teaching but there were no significant differences in mean final exam score between the groups. These results can inform faculty recruitment and faculty development efforts in institutions where more resource intensive curricula create an increased demand for small group preceptors.

1. Background: While teaching is a knowledge-based skill, effective teaching requires an understanding of both what (content knowledge) and how (process knowledge) to teach. Previous studies have shown that content experts are more likely to direct learning whereas non-experts tend to facilitate learning more. This study sought to measure the impact of these different teaching styles on actual learning outcomes of first year medical students. Such data have the potential to inform faculty recruitment and development for small group teaching.

2. Aim: To compare the effect of preceptors with process expertise to those with content expertise on medical students’ learning outcomes in a small group environment at one institution.

3. Methods:
   - All 151 first year medical students at the University of Calgary were included in the study
   - Prospective randomized trial
   - Students were randomly assigned to one of 11 small groups for the Cardiovascular/Respiratory course. Each of the 21 mandatory, two-hour small group sessions included one or more cases with questions for discussion.
   - Each small group was randomly allocated to one of three tracks tutored 1) exclusively by content experts (5 groups), 2) exclusively by process experts (3 groups) or 3) either by a content (11 sessions) or process (10 sessions) expert (3 groups).
   - Faculty were randomly assigned to groups. Content experts (N=60) were subspecialists in Cardiology or Pulmonary medicine whereas process experts (N=11) were generalist physicians who were part of the Master Teacher Program at the university and had completed an eighty hour certificate program in teaching.
   - Faculty received a preceptor guide with cases, questions and answers
   - Assessment of preceptor teaching skills
Students completed a modified version of the Stanford University Faculty Development Program (SUFDP) tool at the end of each small group session.

- Assessment of student performance
  - Performance on end-of-course multiple choice question examination

4. Results: 151 students completed the course, of which 68 were randomized to content expert groups, 41 to process experts groups and 42 to the groups taught by both.

- Master Teachers were rated higher overall and on each domain of the SUFDP tool
- Mean score on Cardiovascular/Respiratory exam was 77.6% for the entire class
- Mean scores were 76.1%, 79.5% and 78.2% for the content expert, process expert and content plus process expert groups (p=.11).
- Process expertise was associated with a small improvement in student performance by linear regression (regression coefficient 2.7 [0.1, 5.4], p<0.05).

5. Limitations: The generalizability of these findings is limited since this was a small, single-center study of one course. All preceptors received answers to the questions and this may have reduced the importance of content expertise as a factor. In addition, it is important to note that the process experts were generalist physicians who had received a significant amount of training in teaching and pedagogy. Finally, while process expertise was associated with an improvement in student performance, this difference was very small and, therefore, of questionable relevance.

6. Implications: This study found no significant differences in learning outcomes between groups where preceptors were exclusively content experts, process experts or a mixture of both. These data can inform faculty recruitment and faculty development efforts in institutions where more resource intensive curricula create an increased demand for small group preceptors.


Summary: This study sought to understand the meaning of physical examination teaching for patients. Semi-structured interviews of 12 hospitalized patients at the Washington DC VA focused on the experience of being examined, perceived benefits to patients and students and a description of the experience itself. Positive impressions of students and suggestions for improvement of physical exam teaching were important findings. In addition, a majority of patient experiences fell into the categories of “tolerance” or “helping.” Educators should employ strategies to increase comfort and enhance value for patients who participate in this important effort.

1. Background: The use of actual patients in physical examination teaching is an important part of medical training; however, the proportion of attending rounds spent
at the bedside has declined from 75% in the 1960’s to 11-27% in recent estimates. Reasons for this decline have included time constraints, reliance on technology and concerns for patient comfort. Yet there is limited literature on patients’ attitudes toward and experiences with bedside teaching. Such data have the potential to inform how we approach patients during bedside teaching and may also impact the actual patient experience during such teaching.

2. Aim: To understand the meaning of physical examination teaching for patients.

3. Methods:
   - Participants were selected using purposive sampling to maximize the diversity of patient experiences, and interviews were conducted by one of three authors 1 day to 1 week following participation in bedside teaching.
   - The interview guide consisted of pilot-tested, open-ended questions focused on the experience of being examined, benefits perceived by patients and students, and a description of the experience itself.
   - Data were collected until thematic saturation was achieved and interviews were audiotaped and transcribed verbatim.
   - Analysis was conducted by two investigators using phenomenological approach to data analysis and disagreements were addressed through discussion. Multiple coders, peer code checking and member checks were used to increase trustworthiness.

4. Results: 12 interviews (1 female, 11 male) were conducted. Mean age of interviewees was 60 (range 52-79).
   - Seven themes regarding patient experiences and four themes regarding meaning of physical exam teaching emerged.
   - Patient experience themes included positive impressions of students, belief that participation was part of the program, expectations that learning was the student’s job, having a positive interaction with the student, surprise at some aspects of the encounter, identifying a range of benefits to participation and suggestions for improving physical exam teaching.
   - Physical exam teaching had four possible meanings for patients: tolerance (no perceived benefit from the experience but willing to endure it), helping (willingness to help students learn), learning (experience contributed to their own learning about their bodies and their medical conditions) and social (experience provided needed social interaction during isolating hospitalization). Most experiences fell into categories of tolerance or helping.
   - Suggestions for improving physical exam teaching included logistical (avoid meal time, give patient lead time) and procedural (asking more questions of the patient, checking for patient comfort during the session) considerations as well as ways to increase rapport building (introduction by the student and a brief introduction to where they are from).
5. Limitations: Participants in this study were predominantly older male veterans; this limits the generalizability of these findings. In addition, the study included only those who had agreed to participate in bedside teaching in the first place which limits applicability of the information to those who voluntarily agree or who are offered a choice.

6. Implications: Students believe that bedside teaching is important for learning physical examination skills yet little is known about the patient experience during such encounters. The results of this study provide evidence that patients hold a positive impression of student education and that the experience can have distinct meanings for patients including tolerance, helping, social and learning. Educators should employ strategies to increase comfort and enhance value for patients who participate in this important effort.


1. Summary: Workshop training of 4th year medicine subinterns in contextual care improved learner behavior in probing for contextual issues and appropriately modifying treatment plans as measured with standardized patients.

2. Background: Clinical decision making requires that a physician correctly identify the diagnosis and best management for a patient’s condition but also that they understand individual patient circumstances and modify the plan of care if necessary (contextualization). A prior study of attending internists by these investigators demonstrated a higher rate of contextual than biomedical errors with unannounced standardized patients.

3. Aims: 1. To evaluate an educational intervention designed to increase physicians’ skills in identifying patient context and 2. To decrease learners rate of contextual errors.

4. Methods: 4th year internal medicine subintern students at two sites in a single medical school were enrolled. Intervention students had 4 weekly 1 hour case-based sessions focused on knowledge and skills in contextualizing patient care covering clinical expertise, the role of patient context in clinical expertise, domains of patient context, contextual red flags, contextual assumptions, and contextual errors. Students applied context to a written case in the first 2 sessions and then interviewed patients in the last 2 sessions. There were 6-8 students at each of 2 sites each month. Each month, 1 site was the intervention and the other the control with this assignment flipping each month.

Students were assessed with 4 standardized patients 3-10 days after the final study workshop. There were 4 standardized patient encounters each with 4 different
variants for a total of 16 possible permutations on standardized patients. In all cases, there were red flags that could indicate one biomedically or one contextually atypical diagnosis. In baseline variants, patients presented no symptoms of atypical diagnosis if probed. In the biomedical or contextual variant, the patient did present symptoms of the biomedical or contextual problem if probed. In the biomedical/contextual variant, patients presented with both atypical situations if probed. For example, in an asthma case, nocturnal cough was a biomedical red flag that if probed would lead to esophageal reflux; the patient’s job loss was a contextual red flag. That if probed would lead to medication non-adherence. Encounters were assessed as to whether the student probed and whether their plan addressed the red flag. Management plans were coded by checklist by an investigator blinded to whether the student was an intervention or control student and whether the student had or hadn’t probed the red flag. Outcomes were assessed using logistic regression including variables of intervention or control group, inclusion or exclusion of the biomedical/contextual variables, case scenario, academic year, time of year, and subinternship site.

5. Results: 189 of 230 students agreed to participate. 17 withdrew and 48 did not present for assessments resulting in 65 in the intervention and 59 students in the control groups. 124 students completed a total of 494 encounters. Students in both the control and intervention groups probed biomedical red flags in 77% of encounters. Students in the control group probed contextual red flags in 61% of encounters compared with 86% for the intervention group (adj odds ratio 3.75 (1.59-8.77)). Students in the intervention group were more likely to write an appropriate treatment plan in the contextual variant than control students (67% (55-79%) vs 24% (13-35%)). There were no significant differences between intervention and control students in likelihood of appropriate management plan for the baseline, biomedical complexity, or mixed biomedical/contextual complexity cases. Probing was associated with a higher probability of an appropriate treatment plan. In contextual cases, appropriate plans were written only 4% of the time when the contextual red flag was not probed, 57% of the time when it was probed by control students, and 71% of the time when probed by intervention students. In biomedical variants, appropriate plans were written 15% of the time when that red flag was not probed, 67% of the time when probing was done by control students; and 65% of the time by intervention students. A sensitivity analysis which assumed that students who did not present for assessment received no benefit from the intervention showed a smaller effect size for probing red flags but the effect of intervention remained statistically significant.

6. Limitations: This trial was done in a single institution in 4th year students which limits generalizability to other institutions and to other classes of learners. The durability of the intervention is unknown as assessment occurred a maximum of 10 days after the workshops. The authors hypothesize that contamination from the quasi-randomization design would likely have biased the results towards the null hypothesis which is likely true. Several students did not undergo the assessment process, but the sensitivity analysis for this limitation resulted in similar findings.
Implications: Specific training in context of care can improve students’ ability to elicit specifics around that context and to modify treatment plans appropriately. The real world common combination of biomedical and contextual variation appears to be more complicated to teach.


1. Summary: PGY1 residents from a single institution performed less well on simulator cases after a 24-30 hr shift as compared to a 16 hr shift and as compared to a rested state.

2. Background: Prior work from the same institution showed a higher rate of errors after a 24-30 hr shift than after a 16 hr shift in an intensive care unit. Simulation has been used as a teaching and training tool and is being proposed as an assessment tool, but simulator assessments have not been correlated with actual clinical behavior with real patients.

3. Aims: 1. To ascertain whether simulator performance correlates with “real work” performance and can be used as an evaluation tool and 2. To validate prior study findings on the effect of work hours on medical resident performance.

4. Methods: 17 PGY1 residents were tested on a high-fidelity simulator during an ambulatory clinic rotation with a ~40 hour work week and no overnight call and then retested after a 24-30 hour shift in the ICU while on a Q3 call schedule. 8 of these same residents labeled as Cohort 2 did a second study in which performance was again tested first during an ambulatory session when rested and after a 16 hour shift that began at 9:00 PM. Comparison sessions occurred within one month and generally were scheduled at the same time of day. Interns received $100 per simulator session.

In each simulator visit, interns completed a warm-up case and then completed two 15 minute standardized cases; first a complex medical case and then a cardiopulmonary arrest (VT versus VF). The intern was given a complex cardiac case (anterior MI or inferior MI) if working in the MICU and a complex pulmonary case (asthma or COPD) if working in the CCU. When retested after call, the intern was given the opposite of the paired cases to guard against recall of the prior case. Testing was always first done in the rested state in order to counterbalance improved performance with time (improvement from session 1 to session 2 against expected deterioration in performance after overnight call biasing the study towards the null hypothesis). Simulator performance was assessed with a previously validated tool assessing 8 domains on a scale of 1-8. The total case score was the average score across all 8
domains; a score of 4 or less was “unsatisfactory.” Scoring was done in real time with a separate blinded videotape review.

5. Results: The interrater correlation coefficient for scoring of on site unblinded directly observed performance versus blinded videotape scoring was 0.80. In Cohort 1, performance declined from 6.0 (5.6-6.4) rested to 5.0 (4.6-5.4) post 24-30 hour shift (p<.001). Performance declined for 13 of 17 interns, improved for 2, and stayed the same for the remaining 2 interns. 4 of 17 (24%) had an unsatisfactory score of <5 when rested increasing to 8 of 17 (47%) after 24-30 hours of call. In Cohort 2, baseline rested scores of 6.6 (6.1-7.1) declined to 5.8 (5.0-6.6) after a 16 hour overnight shift (p=.036). Looking only at the participants in Cohort 2 subset, there was a larger difference between rested (6.1) and post 24-30 hr call (4.3) (p<.001). Performance after a 16 hour night shift (5.8) was significantly better than performance after a 24-30 hour shift (4.3 with p<.001). A higher proportion of interns scored in unsatisfactory range after the 24-30 hr shift (6 of 8 or 75%) than after the 16 hr shift (3 of 8 or 38%).

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<th>Cohort 1 (24-30 hr)</th>
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<th>Cohort 2 (16 hr)</th>
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<tr>
<td>Pre/post scores</td>
<td>6.0 to 5.0 p&lt;.0001</td>
<td>6.1 to 4.3 (p&lt;.001)</td>
<td>6.6 to 5.8 p=.036</td>
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<td>Unsatisfactory</td>
<td>4/17 (24%) pre</td>
<td>6 of 8 (75%)</td>
<td>3 of 8 (38%)</td>
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<td>scores</td>
<td>8/17 (47%) post</td>
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The authors note that the magnitude of deterioration in performance in this study (26%) closely matches the magnitude of deterioration (36%) in a comparison of the same shifts for PGY1 residents of the previous academic year in the same training program where outcomes were actual in hospital errors and attentional deficits. The authors conclude that simulator-based assessment offers a validated alternative to observed evaluation of in-hospital performance.

6. Limitations: Single institution, small sample. There is no statistical comparison between results in this current study and the prior study measuring in hospital performance to support the conclusion that simulation is an equivalent alternative to direct assessment.

7. Implications. Clinical performance of PGY1 residents as assessed by simulation deteriorates after call but to a lesser degree post 16 hour shift than post 24-30 hour shift. New duty hours restrictions will limit PGY1 residents to 16 hour shifts.

Simulation offers learners opportunities to learn clinical skills in a low-stakes environment before providing direct, real-world patient care. This study suggests that learnt clinical skills can also be tested with simulation; where simulation can also serve as an assessment tool of a learner’s clinical behavior in providing real-world patient care. Further study is necessary before substitution of simulation for direct assessment in real clinical settings.

Summary: Investigators assessed resident and program director perception of time spent on clinical documentation versus direct patient care from survey questions on the Internal Medicine In-Training examination and a separate program director survey. Residents reported more time in clinical documentation than in direct patient care while on ward rotations and reported receiving feedback on documentation <50% of the time.

1. Background: While duty hours are shrinking, prior evidence has suggested that residents spend more time doing clerical work. From an educational perspective, activities with limited or no educational benefit should be minimized with increased time spent in direct patient care and in self-reflection.

2. Aim: To measure the amount of resident time devoted to documentation and to direct patient care and to understand the potential educational value of documentation as assessed by frequency of feedback on documentation.

3. Methods: 19,090 residents taking the 2006 Internal Medicine In-Training Examination (IM-ITE) were asked to report:
   - The number of hours spent daily on patient care documentation versus face-to-face direct patient contact during their most recent inpatient service rotation.
   - The frequency and perceived importance of feedback on documentation

Program directors (PDs) from 381 residency programs were asked similar questions about feedback on documentation and were also asked whether time spent on documentation detracted from other learning opportunities.

4. Results: 85.9% (16,402) of residents and 263 (69%) of PDs completed the surveys. 68% of residents reported spending >4 hrs/day on documentation but only 39% reported spending >4 hrs/day in direct patient contact. There were very small differences in time spent in documentation and patient contact across PGY levels, sex, medical schools, and language status.

The majority of residents and PDs perceived that there was feedback on documentation <50% of the time. 54% of IMGs perceived that they received feedback >50% of the time, but only 33.5% of US graduates reported this same frequency.

PDs perceived that feedback on documentation was more important than did residents with 73% of PDs assessing this as at least moderately important as compared to 59% of residents. IMGs felt that such feedback was more important than did US graduates. 57%
of PDs believed that time spent on patient-related clerical documentation detracts from other learning opportunities.

5. Limitations: This study focused on perceptions of time spent rather than actual measures of time. This study explicitly asked about inpatient experiences; outpatient experiences may differ substantially with respect to direct patient contact, documentation time, and feedback.

6. Implications: Internal medicine residents nationally appear to spend more time on documentation than direct patient contact; their program directors believe this is detracting from resident learning. Future efforts should focus on interventions to decrease documentation time and to improve feedback on documentation, thus enhancing its educational value.


Summary:
In a survey of 2682 medical students at 7 medical schools in the US, the authors sought to explore the association of burnout and personal distress with the incidence of unprofessional behaviours and attitudes. Burnout was positively associated with participating in one or more clinically dishonest behaviours, and with having less altruistic views of physicians’ roles in caring for the underserved. Personal distress was not similarly associated.

1. Background:
Professionalism is a core value in medical practice, but the process by which professionalism should be nurtured in medical students is not clear. Studies of medical students have shown that they may frequently fail to demonstrate the professional attitudes and behaviours expected by the profession and society. High levels of personal distress and burnout in medical students are known to be associated with reduced empathy and poorer quality of care. The influence of personal distress and burnout on professional attitudes and behaviours of medical students is not known.

2. Aims:
The authors sought to explore the relationship between burnout along with other measures of distress, and various markers for professional attitudes and behaviours. Their hypothesis was that burnout was a more powerful influence on professional conduct, attitudes toward relations with industry, and attitudes toward their own responsibility to society, than personal distress.

3. Methods:
The authors invited all students in 2009 at 7 medical schools (Mayo Medical School, University of Washington, University of Chicago Pritzker School of Medicine,
University of Minnesota, University of Alabama, University of California-San Diego, and the Uniformed Services University of the Health Sciences) to participate in an anonymous, voluntary survey.

To assess burnout, the survey instrument contained the Maslach Burnout Inventory (MBI) which is the criterion standard for assessment of burnout. This instrument was used as a continuous variable, and categorized as high, intermediate and low risk of burnout, and furthermore dichotomized as burnout present or absent, using various criteria from the MBI subscales. To assess personal distress, the survey contained the PRIME-MD depression screening scale, which has 2 items, and which is known to be sensitive but not specific. Quality of life was assessed using the SF-8 instrument, which produced mental and physical quality of life scores.

The survey assessed professional behaviours and attitudes using questions which explored whether students had engaged in academic cheating, clinical dishonesty, and by administering the Medical Students’ Attitudes Toward Providing Care for the Underserved (MSATU) instrument. Results were transformed from a 5 item Likert scale into an agree vs neutral/disagree dichotomy for analysis. Finally, attitudes toward interactions with industry were assessed with questions derived from the AMA Ethical Guidelines of Gifts to Physicians from Industry.

Descriptive statistics were used to characterize the sample, and bivariable logistic regression was performed to evaluate the relationship between burnout and individual cheating/dishonest clinical behaviors, attitudes toward appropriate relationships with industry, and beliefs about physicians’ responsibility to society. Forward stepwise logistic regression was performed to evaluate associations of all independent demographic and distress variables with engaging in 1 or more cheating/dishonest clinical behaviors and disagreeing with 1 or more of the responsibility to society items.

4. Results:
2682 out of 4400 eligible students (61%) completed the survey. No incentive was provided. The 7 schools had individual response rates of 51%, 55%, 60%, 62%, 63%, 64%, and 66%. Response rate by year in medical school was 65.4%, 63.4%, 59.6%, and 52.6% for first-, second-, third-, and fourth-year students, respectively. Responders were also slightly less likely to be male, non-white, and 25-30 years old.

Dishonest academic behaviours were rarely reported (maximum frequency 1.5%), whereas dishonest clinical behaviours were frequently reported, particularly reporting a physical examination finding as normal when it had been inadvertently omitted from the physical examination (n=499; 43.3%). Students frequently held views inconsistent with the AMA guidelines; for example, only 14% of students’ opinions on relationships with industry aligned with the AMA policy for all 6 scenarios in the 2531 students with complete data. Most students (64.4%-90.2%) espoused altruistic views with respect to physicians’ responsibility to society.
10 of the 12 items on professional conduct and attitudes to serving the underserved were associated with burnout. Students with burnout were significantly more likely to have engaged in each of the cheating and dishonest clinical behaviors evaluated, with the exception of taking credit for another person’s work. On the whole, students with burnout were more likely to have engaged in 1 or more unprofessional behaviors than those without burnout (35.0% vs 21.9%; OR, 1.89; 95% CI, 1.59-2.24). Burned-out students were also less likely to hold altruistic views regarding physicians’ responsibility to society, including their personal role in caring for the medically underserved. The relationship between burnout and opinions regarding appropriate relationships with industry was less consistent.

5 of the 12 items on professional behaviour and providing care for the underserved were associated with personal distress (depression and reduced quality of life). Students with depression were more likely to report cheating on a test, reporting a physical examination finding as normal when it had not been performed, and saying a test had been ordered when it had not.

On multivariable analysis, burnout was the only aspect of distress independently associated with report of 1 or more cheating/dishonest clinical behaviors (OR, 1.76; 95% CI, 1.45-2.13; P .001) or with disagreeing with 1 or more altruistic attitudes regarding physicians’ responsibility to society (OR, 1.65; 95% CI, 1.35-2.01; P .001) after adjusting for demographic characteristics, burnout, positive depression screen, mental QOL, and physical QOL. In contrast, students with a positive depression screen or poor mental or physical QOL were not more likely to engage in cheating/dishonest clinical behaviors or have less altruistic professional values.

5. Limitations:
This study used self-reported behaviour, rather than observations of behaviour as the outcome standard for professional behaviours and attitudes. This may lead to social desirability bias in responses, and an underestimate of the number of unprofessional behaviours and attitudes in the cohort. It is not clear how this would change the observed relationship with burnout. In addition, the range of unprofessional behaviours and attitudes studied is by necessity selective rather than exhaustive, and may not represent the overall tendency of the students to act professionally at this stage of training. Finally, the association between burnout and these attitudes and behaviours is not necessarily a causal relationship, when assessed through a cross-sectional study design.

6. Implications:
Educators concerned with promoting the adoption of professional behaviours and attitudes amongst medical students should be aware of the high reported prevalence of dishonest clinical behaviour, and the likely association of burnout with such behaviour as well as reduced altruism. Identifying students at risk for burnout, and addressing contributing factors, may help them avoid unprofessional behaviours during their training.
Sah S, Loewenstein G. Effect of reminders of personal sacrifice and suggested rationalizations on residents' self-reported willingness to accept gifts: a randomized trial. JAMA 2010 Sep 15;304(11). PubMed PMID: 20841534

Summary:
This experimental study of 93 pediatrics and 230 family medicine residents, examined the causal relationship between (a) providing reminders of personal sacrifices in medical training, and (b) suggesting rationalizations for accepting industry gifts, on the likelihood that those residents would agree that accepting gifts from industry representatives was reasonable.

1. Background:
Despite concerns about the ethics of accepting gifts from the pharmaceutical and device manufacturing industries, some physicians continue to do so. Surveys of medical students in the past have shown that up to 80% of third year students feel that high debts and minimal income justify receiving gifts from industry representatives. However a causal connection between feelings of sacrifice and the development of positive attitudes toward industry gifts has not been shown.

2. Aims:
The authors used an experimental design to examine the causal connection between reminders of personal deprivation of income and sleep in medical training and the rate of agreement with positive statements about gifts from industry among residents.

3. Methods:
Residents in pediatrics were recruited from one hospital (Children's Hospital of Pittsburgh), and family medicine residents were recruited with the help of approximately 450 family medicine program directors. Participants were not aware that the subject of the study was attitudes toward conflict of interest and receiving gifts, which was measured using 10 questions embedded in a larger set of questions evaluating their working conditions and quality of life.

The experimental manipulation consisted of varying the order in which residents were exposed to the survey questions. Residents were randomized into one of three groups: A sacrifice reminders group, in which they were asked questions about lack of sleep and their income, prior to being asked about attitudes toward gifts from industry; a suggested rationalization group, in which they were asked to rate their agreement with a statement that physicians are entitled to gifts because of the financial sacrifices involved in training, prior to their attitudes about personally accepting gifts being ascertained; and a control group, in which their attitudes toward gifts were measured before the other questions were asked. Furthermore, the 2 non-control groups were further subdivided, to vary the intensity of the reminders of their personal sacrifices by altering the items' wording.

The authors used complex statistical methods to determine the effect of the sacrifice reminders and suggested rationalization on the likelihood that students would endorse participating in situations with conflicts of interest in the 10 questions that assessed this.
The tendency of a student to endorse such situations was converted to a dichotomous variable based upon whether their answers fell below or above the median of the entire group for the 10 aggregated questions. Multiple logistic regression modeling was used to gauge the effect of the different experimental interventions.

4. Results:
323 residents (93 from pediatrics, 230 from family medicine) participated, with a 93% participation rate for pediatrics, and an uncertain rate for family medicine, because the number invited was not known. 69 residents were randomized to the control group, 127 to the sacrifice reminders group, and 127 to the suggested rationalization group. The 2 experimental groups were each further divided to a total of 4 subgroups with between 60 and 67 members, for the variation in item wording described above. 12 participants were excluded from analysis as they were found not to be residents at the time of the survey. Compared to pediatric residents, family residents were more likely to be male, to be in first year, to have more hours of on-call sleep, and to be more satisfied with their working conditions. There were no differences in baseline variables between the study groups.

Overall, 37.5% of residents agreed with the suggested rationalization statement about receiving gifts from industry. The odds of agreement increased for those who had the sacrifice reminders questions first, and for those who reported poor working conditions. The rate of agreement with all 10 questions about receiving gifts from industry was highest for those in the suggested rationalization group, and lowest in the control group. This effect was seen in both family medicine and pediatric residents. Even those who disagreed with the rationalization itself were more likely to agree with the questions about acceptability of gifts from industry if they were in the suggested rationalization group. The effect of magnifying the intensity of the sacrifice reminders about income and sleep was to increase the rate of positive agreement with the questions about accepting gifts. This effect was also independent of participants' baseline views of their own working conditions.

5. Limitations:
The recruitment strategy involved very different methods between family medicine and pediatrics residents. There is no way to compare family medicine participants with non-participants, so the effects of recruitment bias cannot be ascertained. The authors did offer a media player to 1 in 100 family medicine residents as an enrollment incentive, and in so doing may have biased their sample from this group, in terms of views on the acceptability of gifts. There are many statistical comparisons, all done with a significance level of P<0.05, so the possibility of type 1 error for some of the statistically significant differences exists. Finally, the authors could have examined the effect of the magnitude of resident debt from medical training, as a possible additional factor to explain views on the acceptability of gifts.

6. Implications:
This study provides experimental evidence to show that residents' views on the acceptability of gifts from industry can be influenced both by reminders of personal sacrifice involved in training, and by the rationalization that residents can accept gifts
because they experience reduced income and increased debt while training. The effect is
dose dependent, in that more intense reminders of sacrifices increase the odds of residents
viewing such gifts as acceptable. Attendings and program directors should be aware of
the power of these methods when educating residents about how to interact appropriately
with industry.

Dyrbye LN, Power DV, Massie FS, Eacker A, Harper W, Thomas MR, Szydlo DW,
Sloan JA, Shanafelt TD, Factors associated with resilience to and recovery from
burnout: a prospective, multi-institutional study of US medical students. Med Educ

Summary:
Surveys in 2006 and 2007 for the entire student population of 5 medical schools aimed to
assess the association between learning environment, social support and stress on
resiliency to burnout, and the tendency to recover from it. Increased resiliency was
associated with positive views of the learning environment, non-white minority status,
and faculty support, and decreased resiliency was associated with part-time employment
and major life events. Very similar associations were found with the likelihood of
recovery from burnout.

1. Background:
Psychological distress is common in medical students, with up to 50% prevalence of
burnout, 25% prevalence of depression symptoms, and a high incidence of chronic
anxiety and reduced quality of life. Few students seek help, and symptoms may persist
into residency and beyond. However, not all students experience burnout, and some who
do subsequently recover. Previous work has shown that negative life events, and certain
aspects of the learning environment, can increase vulnerability to burnout, and that
minority status can increase resistance, among medical students. Work with physicians
and others suggests that workplace characteristics and social supports may increase
resistance to burnout and improve recovery from it.

2. Aims:
The authors sought to determine whether students who perceive their learning
environment positively, or have greater social support, are more resilient to burnout or
more likely to recover from it, and whether students experiencing greater than usual
stress are more vulnerable or less likely to recover.

3. Methods:
The authors undertook paired surveys of the entire medical student population of 5
medical schools (Mayo Medical School, University of Minnesota, University of
Alabama, University of Washington, and University of Chicago Pritzker School of
Medicine) in 2006 and 2007. The 2007 survey was done in followup of students enrolled
in both 2006 and 2007. Responses were used only for students who responded in both
years. Both surveys included the Maslach Burnout Inventory, the criterion standard scale
for burnout; the SF-8, to assess mental and physical quality of life; and the PRIME-MD
screening questionnaire for depression. The 2007 survey also included the Epstein Sleepiness Scale and the Perceived Stress Scale, which assessed sleep deprivation and stress, respectively. Other items asked about major life events (eg. marriage, birth/adoption of a child, death in family), levels of student debt, employment outside school (in 2007 only), social supports, and views on their learning environment.

Respondents were judged to have burnout if at any time they reached a cutoff value on either of 2 subscales of the MBI. Those without burnout in either 2006 or 2007 were classified as resilient; those with burnout in 2006 but not 2007 were classified as recovered; those with burnout at both periods were classified as chronic burnout; those with burnout in one or more periods were considered vulnerable to burnout.

Descriptive statistical methods were used to characterize the cohort, and comparisons were made between resilient vs vulnerable students (comparing those never burned out with those burned out at least once); and recovered vs chronically burned out students (comparing those who were burned out at first but not at second survey with those burned out at both surveys).

Multivariable logistic regression was used to examine the relationship of various independent variables (eg. personal characteristics, learning environment, personal stress and social supports) with the outcomes of resiliency or recovery from burnout.

4. Results:
Response rates of 1701/3080 (55.2%) in 2006 and 858/1321 (65%) in 2007 resulted in a study cohort of 792 students who completed the MBI on both occasions. Third year students from 2006 were slightly less represented in the sample. 25/792 students (3.1%) either continued 4th year studies in both periods or indicated an alternative pathway, such as research years.

36.6% of the 792 students were resilient, and 63.4% were vulnerable to burnout. Of the 502 students who were vulnerable, 54% were chronically burnt out, 19.7% had recovered in 2007, and 26.3% developed new burnout in 2007. Resilient students reported fewer depressive symptoms and greater mental and physical quality of life.

No association between personal characteristics and resiliency was found. Students who were employed had an odds ratio for resiliency of 0.56, ie. were half as likely to be resilient, whereas student debt had no such association. Each major life event was associated with an odds ratio of 0.86, ie reduced the odds of resiliency by 14% per event in the previous year. Satisfaction with family support, learning environment, and faculty/staff support were each associated with increased likelihood of resiliency. Higher levels of fatigue, stress and sleep deprivation were associated with reduced likelihood of resiliency.

Recovery from burnout was not related to any demographic or personal characteristics. Increased fatigue, stress, and sleep deprivation were associated with reduced likelihood of recovery from burnout. Perceived support from faculty, and satisfaction with the
learning environment were each associated with greater likelihood of recovery from burnout.

Factors positively associated with resiliency to burnout on multivariable regression were: Non-White minority status; increased satisfaction with the learning environment; and greater agreement that student education is a priority for faculty members. Higher fatigue and higher stress were negatively associated with resiliency. Factors positively associated with recovery from burnout were: Non-White minority status, and greater agreement that student education is a priority for faculty members. Higher stress and working for income were negatively associated with recovery from burnout.

5. Limitations:
The survey methodology has the limitation of response bias, and it is not known how burnout affects the likelihood of response to these surveys. Students who had transferred, left medical school, or taken a leave of absence in 2007 were excluded from the study; these may have represented the most severely burned out students. Some variables, such as stress and sleep deprivation, were only assessed in 2007, and others, such as satisfaction with learning environment and with social supports, were only assessed at baseline in 2006. Thus the sequence of these variables relative to the development of burnout, or lack thereof, is unclear, making the causal link weaker. Finally, other unmeasured factors may have been more powerful in determining resiliency or recovery from burnout.

6. Implications:
In conjunction with the authors' previous work examining the role of the learning environment in the development of medical student burnout, this study highlights important personal and institutional factors that may reduce the risk of burnout, or improve the chances that medical students recover from it. The key roles of faculty and staff in both scenarios are highlighted here, in that the perception that student education is a priority for supervisors seemed to demonstrate a protective effect.


Summary
This study sought to assess the sustainability of IM residents’ CQI projects in an ambulatory clinic. The CQI projects, part of the residents’ participation in curriculum using the ABIM’s Clinical Preventive Services (CPS) Practice Improvement Model (CIM), are created and implemented during the PGY2 ambulatory month and reviewed for sustainability during the PGY3 ambulatory rotation. Three of the resident-implemented and evaluated CQI projects found sustained improvement at both early and later evaluation points (2-4 weeks and 2-6 months respectively). The resident-
implemented and evaluated projects with sustained improvements were medication bottle project, smoking cessation and aspirin use.

1. Background
The ACGME continuity clinic requirements now include resident involvement in the continuous quality improvement process based on review of individual performance data. ABIM provides a curriculum in its Practice Improvement Modules (PIM) that are used to teach physicians CQI principles. An adaptation of the curriculum was used for this study.

2. Aims
The study has a threefold aim: 1) to describe the CQI curriculum at the ambulatory clinic for IM residents; 2) to examine resident’s assessment of the sustainability of their group’s CQI projects and 3) to identify themes that describe successful sustainable projects through a qualitative methodology.

3. Methods
The CQI curriculum for residents in a single institution’s resident’s continuity clinic; the ambulatory clinic was divided into two phases across the PGY2 and PGY3 years, each conducted in small groups. PGY2 residents first completed a quality assessment block and an ABIM PIM, followed by a QI project block including the development of a QI project. PGY3 residents completed sustainability and spread block and then measured the sustainability of the QI project created during the PGY2 year. Each block lasted one month, with a total of four months spent in the quality assessment and improvement curriculum. The last component of the PGY3 participation in the CQI curriculum included a focus on pay for performance with didactic and review of essential QI concepts. Residents also completed the ABIM PIM and presented a poster on their work.

During a three period from 2006 to 2009, 64 (100%) of internal medicine residents participated in the sustainability assessment of QI projects. A total of 6 groups projects were evaluated at an early phase (2-4 weeks) and later phase (2 to 6 months) post-intervention. Statistical significance was defined as p<0.05.

4. Results
64 (100%) of IM residents participated in the sustainability portion of the study during a three-year period (July 2006 to June 2009). Six QCI projects were completed during that time period and evaluated at 2-6 weeks post intervention and at 2 to 6 months post intervention. The three projects that saw sustained improvement were documentation of aspirin use in CAD, DM, CVA; documentation of review of patient medications “medication bottles” project; and documentation of smoking status and referral to a smoking cessation clinic. In the medical bottle projects, patients were encouraged to bring in their medication bottles at each visit and reminded physicians about Joint Commission requirements that patients receive an updated medication list at each visit. Three projects did not see a sustained improvement: BMI documentation; appropriate medication dictation “medication refills” and resident provided social support.
Sustained improvement

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Baseline</th>
<th>Early (weeks)</th>
<th>Late (mos)</th>
<th>p value (late)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin use</td>
<td>55%</td>
<td>67%</td>
<td>75%</td>
<td>p=0.002</td>
</tr>
<tr>
<td>Medication bottles</td>
<td>56%</td>
<td>76%</td>
<td>74%</td>
<td>p=0.002</td>
</tr>
<tr>
<td>Smoking</td>
<td>41%</td>
<td>67%</td>
<td>82%</td>
<td>p=0.032</td>
</tr>
</tbody>
</table>

Non-sustained improvement

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Baseline</th>
<th>Early (weeks)</th>
<th>Late (mos)</th>
<th>p value (late)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>4%</td>
<td>79%</td>
<td>41%</td>
<td>p=0.808</td>
</tr>
<tr>
<td>Medication refill</td>
<td>75%</td>
<td>91%</td>
<td>75%</td>
<td>p=0.808</td>
</tr>
<tr>
<td>Social support</td>
<td>10%</td>
<td>25%</td>
<td>no data</td>
<td></td>
</tr>
</tbody>
</table>

The 64 (100%) participating residents brainstormed themes as to what contributed to the sustainability of the QI projects that showed sustained improvement. The identified themes of successful sustainable projects are: integration into the clinic system; decreasing burden in the clinic; resident turnover can cause projects to become part of “clinic memory; and residents who are flexible and open to change. The identified theme of non-sustained projects was that projects that included only educational interventions were insufficient for sustainability.

5. Limitations
Study limitations included no comparison group, the potential unevenness of both individual and group participation in creating and implementing CQI projects, changes to the ambulatory clinic environment that affected the implemented projects, and clinical evidence prompting specific QI initiatives.

6. Implications
Integrating frequent assessment of QI projects promotes identification of elements that contribute to sustainability and spread of initiatives. Assessment of QI efforts enforces the understanding that continuous efforts are needed to create a sustained improvement.


Summary
This is a qualitative study using the critical incident technique and appreciative inquiry to develop a set of themes and propose a model of clinical supervision. The study consisted of qualitative analysis of interview transcripts from 44 (88%) attending physicians and 46 (92%) residents at the conclusion of the general medicine rotation. Based on analysis of shared themes between physicians and residents, an optimal supervision mnemonic model of SUPERB (for attendings) and SAFETY (for residents) was created. The SUPERB mnemonic focuses on setting expectations and encouraging communication;
the SAFETY mnemonic emphasizes seeking out supervision and guidance and particularly emphasizes clinical and end-of-life decision-making periods as times to ask for assistance. The SUPERB/SAFETY model encouraged resident decision-making autonomy while maintaining easy access and availability to attendings.

1. Background
Clinical supervision is not well-studied in the literature. Clinical fields depend on examining effective supervisory practices from the general workplace, which does not consider the unique circumstances of the clinical setting. Lack of training in supervision can have an adverse impact on patient care and trainees.

2. Aims
The aim of this study was to use a qualitative methodology with internal medicine residents and attendings to discover shared themes around the challenge of effective clinical supervision in order to develop a model to guide supervision.

3. Methods
A single academic institution served as the site for the qualitative study. Ninety-two percent (46) of the residents and 88% (44 of 50) attending physicians on the general medicine rotation were interviewed within one week at the conclusion of their final on-call night. A single interviewer conducted all of the interviews using the critical incident technique, with additional probing questions based on appreciative inquiry, a technique designed to elicit improvements in a system by the individuals within the organization. The transcribed interviews were analyzed at the level of sentences and phrases. Three reviewers each analyzed 10% of the transcripts (8 transcripts: 4 residents; 4 attendings), identifying and developing themes. Consensus was used to obtain interrater reliability. Once the thematic structure was created, one reviewer analyzed the remaining transcripts to further establish the themes.

4. Results
Interrater reliability for the inductive coding of the interviews was K=0.70. The themes developed from the effective practices described in the interviews formed a mnemonic model that could be used in clinical supervision.

Table: Models for Seeking/Providing Supervision for Attending Physicians and Resident Physicians (n= interviews mentioning theme; 90 total interviews

<table>
<thead>
<tr>
<th>SUPERB: model for attending physicians providing supervision</th>
<th>SAFETY: model for resident physicians seeking supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set expectations for when to be notified (41)</td>
<td>Seek attending physician input early (28)</td>
</tr>
<tr>
<td>Uncertainty is a time to contact (68)</td>
<td>Active clinical decisions (39)</td>
</tr>
<tr>
<td>Planned communication (36)</td>
<td>Feel uncertain about clinical decisions (40)</td>
</tr>
<tr>
<td>Easily available (48)</td>
<td>End-of-life care family/legal discussions (46)</td>
</tr>
<tr>
<td>Reassure resident not to be afraid to call (50)</td>
<td>Transitions of care (43)</td>
</tr>
<tr>
<td>Balance supervision and autonomy for resident (46)</td>
<td>Help with the sYstem/hierarchy (22)</td>
</tr>
</tbody>
</table>
5. Limitations
The results of the study may not be generalizable as it used a qualitative analysis of physician interviews conducted at a single institution. The point at which the participants were interviewed – at the end of their month-long rotation – may have had an effect on their recall of events.

6. Implications
The SUPERB/SAFETY model generated by this study offers a heuristic for residents and attendings with which to invite (for residents) or provide (for attendings) appropriate supervision. The challenge that supervision is most often initiated by residents requires a jointly-agreed upon set of expectations to eliminate potential hesitation in requesting supervision that ensures patient safety and adequate training.


Summary: This study describes an assessment of the existing status of sign-out at a single institution and then describes the use of findings to develop and implement and then re-assess a curriculum and system change. The curriculum consisted of a 30-minute didactic and a 30-minute interactive component. The system change involved the implementation of web-based program for creating sign-out sheets. Assessment included direct observation of oral sign-out looking at completeness and accuracy with improvement in both domains. The pre-assessment (100 observations on 14 randomly selected interns) and post-assessment (61 observations on 12 randomly selected interns) included a direct observation of oral sign-out eight weeks later, with rating by two trained residents using an eight-item checklist. The written sign out was evaluated for completeness (pre-assessment 51 patients; post-assessment 71 patients and accuracy (pre-assessment 28 patients from 14 residents; post assessment-28 patients from 12 residents). Completeness was determined using an 8 item checklist and a consideration of legibility. Accuracy was determined through comparison of the sign-out sheet with the patient record within 30 minutes of the sign out. Following the curriculum, interns orally reported all seven items in the SIGN-OUT mnemonic more frequently (p<.001 for 6 items; p<.02 for 1 item). The percentage of complete written sign-out sheets rose from 16% to 70% (p<.001). The accuracy of written sign out also improved in three of four areas (identification data 64% vs. 89%; code status 82% vs. 100%; and medication list 4% vs. 79%; all p<.001) with no change in allergy list (96% vs 82% p=.82). This study suggests that an appropriately focused curriculum based on needs along with the implementation of a Web-based written sign-out system can improve the quality of both oral and written sign out.

1. Background: Given the increase in frequency of hand-offs within the inpatient setting, the education and evaluation of interns and residents with regard to sign out behaviors is a priority for internal medicine residency programs.
2. Aim: The purpose of this study was to assess the status of sign-out at a single institution and to develop, implement and evaluate the impact of a new sign out curriculum and system on intern sign-out behaviors.

3. Methods: Prior to the development of the curriculum, investigators assessed current sign-out practices through various mechanisms including: 1) survey of residents regarding current sign-out practices; 2) direct observation of 100 sign out encounters by 14 randomly chosen interns with rating based on the Yale University “SIGN-OUT” mnemonic*; 3) review and scoring sign out sheets completed by 14 interns for eight items and legibility and 4) review of sign out sheets on 28 patients for accuracy by review of medical record within 30 minutes of sign out. The pre-assessment revealed the need for system and individual level changes. The developed curriculum was delivered to 15/21 (71%) of interns and included a didactic component and interactive component. Additionally, a Web-based program for creating sign-out sheets was developed. The 30-minute didactic curriculum highlighted the dangers of improper sign-out and reviewed components of proper sign out based on the SIGN-OUT mnemonic. Results of pre-training assessment were shared during the session. The 30 minute interactive small group component allowed interns to practice oral sign-out and receive feedback from facilitators and peers. Each intern received a printed copy of the SIGN-OUT pneumonic. Post training assessment consisted of a 10-item survey to assess beliefs of interns regarding sign-out immediately following the session and direct observation and rating of 61 encounters by 12 randomly chosen residents 8 weeks after. Additionally written sign-out was assessed by checklist on 74 patients and accuracy of written sign out was assessed on 28 patients, both with the same techniques as done in the pretraining period.

4. Results: After interns participation in the curriculum both oral and written sign-out skills improved through objective measurements (TABLES). Also of the 80% (12/15) interns that complete the post-training survey 75% (9/12) reported that they were satisfied with course and felt that they would provide better sign out.

Completeness of the spoken sign out

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre-training observation N (%)</th>
<th>Post-training observation N (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S= Sick or do not resuscitate status</td>
<td>N=100</td>
<td>N=61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16 (16)</td>
<td>33 (54)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>I= Identification data</td>
<td>26 (26)</td>
<td>59 (97)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>G= General hospital course</td>
<td>92 (92)</td>
<td>61 (100)</td>
<td>&lt;.02</td>
</tr>
<tr>
<td>N= New events of day</td>
<td>39 (39)</td>
<td>58 (95)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>O= Overall health</td>
<td>21 (21)</td>
<td>53 (87)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>U= Upcoming possibilities</td>
<td>37 (37)</td>
<td>54 (89)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>T= Tasks to do</td>
<td>50 (50)</td>
<td>57 (93)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Completeness and Accuracy of Written Sign Out

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre-training observation N</th>
<th>Post-training observation N</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Limitations: This study was completed at a single institution that was using written sign-out as the standard, and may not be generalizable to other settings, however, the methodology for development of the curriculum is certainly transferable. Faculty time and resources for this process would need to be considered. It is possible that interns behavior was positively impacted by being directly observed and may not represent their behavior at other times, though this would have equally influenced pretraining and posttraining assessments. Results also may have been biased by inability to include all interns.

6. Implications: This study has described a feasible mechanism for both teaching and evaluating the sign out process. The curriculum and assessment addressed both written and oral sign-out and the assessment of written sign-out considered both accuracy and completeness.

*Yale University SIGN-OUT mnemonic

S- Sick or “Do not resuscitate” status
I- Identification data
G- General hospital course
N- New events of the day
O- Overall Health
U- Upcoming possibilities
T- Tasks to do


<table>
<thead>
<tr>
<th></th>
<th>(%)</th>
<th>(%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completeness</strong></td>
<td><strong>N= 51</strong></td>
<td><strong>N=74</strong></td>
<td>.001</td>
</tr>
<tr>
<td>Legible and included all data</td>
<td>8 (16)</td>
<td>57 (77)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td><strong>N= 28</strong></td>
<td><strong>N=28</strong></td>
<td></td>
</tr>
<tr>
<td>Matched ID data</td>
<td>18 (64)</td>
<td>25 (89)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Matched code status</td>
<td>23 (82)</td>
<td>28 (100)</td>
<td>&lt;.011</td>
</tr>
<tr>
<td>Matched medication list</td>
<td>1 (4)</td>
<td>22 (79)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Matched allergy list</td>
<td>27 (96)</td>
<td>23 (82)</td>
<td>.16</td>
</tr>
</tbody>
</table>

Farnan JM, Paro JA, Rodriguez RM, Reddy ST, Horwitz LI, Johnson JK, Arora VM. Hand-off education and evaluation: piloting the observed simulated hand-off
Summary: This study describes the creation of an Observed Simulated Hand-off Experience (OSHE) to evaluate medical student hand-off skills using a real-time assessment tool, the mini-CEX. Thirty-two fourth year medical students enrolled in an elective focused on preparation for residency participated in a 90 minute interactive session focused on provision of high quality written and oral sign outs. One week after the workshop students participated in a two hour standardized hand-off experience. They reviewed a mock history and physical of a patient admitted with pneumonia and then viewed a 5 minute video of interval events. Students were then required to complete a written sign out and deliver an oral sign-out to standardized resident receivers. Residents used a hand-off CEX to evaluate and provide feedback to the students. A single faculty reviewer assessed the sign out on a 20 point scale. Standardized resident receivers rated overall student performance with a mean score of 6.75 (range 4-9, max 9). Faculty review of the written sign-out revealed a mean score of 16.2 (range 0-20, maximum 20). The most frequent omission was lack of anticipatory guidance to the covering physician. Though this study has limitations in its evaluation, it describes a novel method, the OSHE, for teaching effective hand-off skills to medical students. The Hand-off CEX may be a promising tool for both training purposes and in-hospital hand-offs.

1. Background: Given the increase in frequency of hand-offs within the inpatient setting, the education and evaluation of future physicians in proper hand-off communication is vital. Standardized patients and the observed structured clinical exam (OSCE) are validated for teaching clinical skills and may hold promise for teaching and assessing the hand-off skill.

2. Aim: The purpose of this study was to create an Observed Simulated Hand-off Experience (OSHE) to evaluate fourth year medical student hand-off skills using an adaptation of a real-time assessment tool, the Hand-off CEX.

3. Methods: The OSHE was a module in a month-long skills-based elective taken by 32 fourth year medical students. The interactive session was 90 minutes and focused on importance of face to face communication, questions from the receiver and provision of a detailed to-do list and anticipatory guidance. Students were given an example of a high quality sign-out. Students received a pocket card and electronic access to workshop materials. One week following the workshop students participated in a standardized hand-off experience. Students had 10 minutes to review a mock history and physical examination transcript of a patient with pneumonia and they then viewed a 5 minute video of interval patient events, intended to trigger anticipatory guidance and “to do” items. Students were then given 15 minutes to complete a blank sign-out sheet and an additional 10 minutes to complete an oral sign out to a standardized PGY-2 or 3 Internal Medicine resident receiver and receive feedback on their performance. Evaluation of the oral sign-out was based on the Hand-off CEX and included assessment in five domains including organization, communication skills, content, clinical judgment and humanistic
qualities. In addition, students received an overall hand off competence score. Each domain was scored on a 9-point scale. The written sign-out was scored by one investigator on a 20 point scale. Students also completed a pre-post self-assessment of hand-off preparedness.

4. Results: Standardized resident receivers rated overall student performance with a mean score of 6.75 (range 4-9, max 9). Faculty review of the written sign-out revealed a mean score of 16.2 (range 0-20, maximum 20) The most frequent omission was lack of anticipatory guidance to the covering physician. Student self assessment revealed statistically significant improvement in preparedness for providing hand-offs (27% vs. 67% reporting being well-prepared or very well prepared).

5. Limitations: This study was completed at a single institution with a limited number of self-selected students and involved evaluation of only one hand-off scenario. This study did not include a pre-post skills assessment or a control group and the tool used was not validated as it was modified.

6. Implications: This study has described a novel method, the OSHE, for teaching effective hand-off skills to medical students. The Hand-off CEX may be a promising tool for both training purposes and in-hospital hand-offs.