Student Performance on Smoking Cessation Counseling With Standardized Patients

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BACKGROUND AND OBJECTIVES: Gaps in medical school education exist for the leading preventable cause of morbidity and mortality in the United States—cigarette smoking. This report is on an innovative medical student curriculum of smoking cessation with a high-stakes required performance assessment during a third-year clerkship in family medicine addressing the following questions: (1) Can medical students consistently achieve high levels of performance providing smoking cessation advice with standardized patients and (2) Is the performance on standardized patients associated with other concurrent cognitive test performance on comprehensive topics relevant to family medicine?

METHODS: From 1997–2002 (Cohort 1), 470 students completed a focused assessment with standardized patients on smoking cessation counseling. From 2003–2007, 277 students completed a revised, complex shared decision making assessment on smoking cessation with standardized patients. Associations between student performance on standardized patients and concurrent cognitive examinations were analyzed.

RESULTS: High levels of student performance were sustained on standardized patients and were inconsistently associated with other concurrent (written and oral) cognitive examinations.

CONCLUSIONS: These findings further substantiate a need for broadening the range of assessing medical student competency beyond cognitive evaluations alone. Medical students can consistently achieve high levels of smoking cessation counseling with standardized patients regardless of the complexity of approach or performance on other concurrent examinations.

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Cigarette smoking remains the leading cause of preventable morbidity and mortality in the United States. Considerable evidence supports the effectiveness of physician-delivered interventions on smoking cessation. The Public Health Service recommends that all clinicians counsel their patients to quit smoking. It has been recommended that competency in tobacco dependence interventions should be a core graduation requirement of all new physicians and other key health care professionals. A 1995 worldwide survey of 1,353 medical schools reported that only 11% of medical schools have specific modules on tobacco use, and only a third taught smoking cessation techniques. A 1999 national survey of US medical schools reported that only 31% of schools require clinical training in smoking cessation counseling, concluding that medical school graduates are not adequately trained to treat nicotine dependence. A follow-up survey in 2002 of US medical schools reported continued gaps in education on tobacco inventions with very few schools actually assessing clinical performance competency.

A 2008 survey of fourth-year medical students in New York City reports that 64% of the students rate their own preparation to assist patients to quit smoking as less than adequate. A 2009 study comparing the knowledge of medical students in two European cities (Gottingen and London) on tobacco dependence and treatment reported under-estimation of mortality, misunderstanding of the effectiveness of treatment programs, and lack of both confidence and competence to counsel smokers. These surveys and reports speak strongly for a critical need for medical schools to provide comprehensive education for medical students on tobacco dependence and clinical training in smoking cessation counseling to the level of performance competency.
In 1997, the Michigan State University College of Human Medicine (CHM) initiated a required comprehensive tobacco intervention curriculum for all medical students integrated over the first 3 years of medical school (Table 1). In 1999, the curricular content was upgraded based on the recommendations of the national survey of US medical schools by Ferry for both basic science (cancer risk from tobacco, health effects: tobacco-related diseases, effects of passive smoking, cigarette smoke contents [nicotine, tar, carbon monoxide], nicotine withdrawal symptoms, high-risk groups with most difficulty quitting [eg, teens, pregnancy, psychiatric disorders]) and clinical science (clinical intervention [5 A’s—Ask, Advise, Assess, Assist, and Arrange], relapse prevention, pharmacologic agents: nicotine replacement or antidepressant therapy, smoking cessation techniques in artificial setting [no patients], smoking cessation techniques in clinical setting with patients and evaluation of performance). The curriculum culminated in a high-stakes (must pass to pass the clerkship) required performance assessment during the family medicine clerkship, with a videotaped, simulated patient willing to quit smoking.

In 2003, the standardized patient performance assessment was revised to include a complex shared decision making approach to preventive care reflecting actual clinical practice where some smokers are ready to quit smoking and others who are not interested right now but prefer to focus on other health screening (Figure 1). The main objective of this study is to determine whether medical student performance on standardized patients providing smoking cessation advice can be consistently achieved at high levels according to guidelines over time.

The above curriculum, including a performance assessment, is costly and labor intensive for both students and faculty. Would a knowledge assessment necessary to fulfill curricular goals? Performance on standardized cognitive tests by students is generally endorsed by medical educators as an important criterion for admission and predictive of future overall performance, especially cognitive performance.

A meta-analysis of 23 selected studies concluded that the “predictive validity of the MCAT ranges from small to medium for both medical school performance and medical board licensing exams.” A cohort study of US medical schools report the MCAT scores to be strongly predictive of all

### Table 1: MSU College of Human Medicine Tobacco Intervention Curriculum Content

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ten hours integrated content years 1–3</td>
<td></td>
</tr>
<tr>
<td>All students role play, tried with preceptor on actual patients, then SPI (standardized patient instructor) interaction during third-year family medicine clerkship</td>
<td></td>
</tr>
<tr>
<td>Requirement to pass family medicine clerkship</td>
<td></td>
</tr>
<tr>
<td>Videotaped and scored on 10-point scale, based on US Public Health Service (USPHS) guidelines for Cohort I (1997–2002)</td>
<td></td>
</tr>
<tr>
<td>Videotaped and scored on 30-point scale, based on USPHS guidelines with two alternative scenarios for Cohort II (2003–2007)</td>
<td></td>
</tr>
</tbody>
</table>

MSU—Michigan State University

### Figure 1: Student Problem-based Assessment on Smoking Cessation and Colon Cancer Screening Flow Chart (Cohort 2)

1. **Cancer Screening**
   - **Patient Clearly at Risk for Colon Cancer**
     - **Colonoscopy Recommended**
     - **Student Discusses Screening Options Using Shared Decision Making**
   - **No**

2. **Smoking Cessation**
   - **Ask**
   - **Advise**
   - **Assess—Ready to Quit?**
     - **Yes!**
     - **Assist**
   - **No**
   - **Arrange**

5 R’s
- Relevance
- Risks
- Rewards
- Roadblocks
- Repetition

**CANCER**

**SCREENING**

**PATIENT CLEARLY AT RISK FOR COLON CANCER**

**COLONOSCOPY RECOMMENDED**

**STUDENT DISCUSSES SCREENING OPTIONS USING SHARED DECISION MAKING**

**SMOKING**

**CESSATION**

**ASK**

**ADVISE**

**ASSESS—READY TO QUIT?**

**YES!**

**ASSIST**

**ARRANGE**

**5 R’s**
- Relevance
- Risks
- Rewards
- Roadblocks
- Repetition
three Step exams especially Step 1. A recent follow-up study of 36 classes between 1970 and 2005 of Jefferson Medical College reports the MCAT to be “moderately correlated” with performance in medical school and scores on medical licensing examinations. On the other hand, admission ranking (based on grade-point ratio, MCAT, and interview) did not predict clinical performance or patient satisfaction in a third-year objective structured clinical examination (OSCE). A cohort study of 3,424 Canadian physicians reported that scores achieved in patient-physician communication on a national licensing examination predicted complaints to authorities when in actual clinical practice.

Due to the above inconsistencies in testing to predict overall performance, “competency-driven education is becoming a standard for medical education in the United States.” Assessment with standardized patients is becoming an integral part of medical education. In the 1990s, George Miller proposed a pyramid framework for assessing clinical competence, beginning with cognitive knowledge as a foundation (knows) leading to actual observed performance (does). Since Miller’s proposal, numerous standardized patient assessments have been developed by educators, including the required National Board of Medical Examiners (NBME) US Medical Licensing Examination (USMLE) Step 2 Clinical Skills exam. A major question for educators is: what are the associations of concurrent cognitive test performance (multiple choice and oral exams) with actual skill-based, observed performance of medical students on standardized patients? Simply put, does doing well on one test predict doing well on other tests regardless of topic or format? The secondary objective of this study is to determine whether medical student performance on a standardized patient providing smoking cessation counseling is independent of performance on other comprehensive concurrent cognitive examinations (multiple choice and oral exams) taken during the same clerkship and not directly related to smoking cessation counseling. This study uniquely reports on a 10-year (1997–2007) cohort (n=747) of third-year medical students in CHM participating in the family medicine clerkship who are required to pass concurrent performance assessments with standardized patients on smoking cessation and cognitive examinations (multiple choice and oral examinations) on comprehensive topics in family medicine.

**Methods**

During the family medicine clerkship, all medical students were required to complete a cognitive standardized multiple choice examination based on the Essentials of Family Medicine text and an oral examination based on common cases in family medicine. The multiple choice exam is developed by family medicine educators across the United States and used as a shelf exam equivalent by many medical schools. The oral examination was developed by consensus of the community clerkship directors and based on common problems such as pharyngitis, congestive heart failure, or ankle sprain seen during the clerkship. Prior to the fall of 2002 (ie, fall 1998–spring 2002), a 50-point scale was used in both the multiple choice and the oral examination. Thereafter, a 100-point scale was implemented. Exam scores prior to the fall of 2002 were multiplied by 2 to turn them into a 100-point scale and have comparable exam scores throughout all years and campuses.

From 1997–2002 (Cohort 1), 470 medical students completed a revised shared decision making standardized assessment based on a model of preventive care and smoking cessation. The RIP-UU model (role, issue, preference, uncertainties, and understanding) is relevant to most clinical care where smoking patients are in different stages of changes (pre-contemplation, contemplation, preparation, maintenance, and action). Though all standardized patients were smokers, nearly 50% of the standardized patients were ready to take action to quit smoking, with other patients preferring to focus on different preventive measures such as colon cancer screening during the session. Standardized patients were 50-plus-year-old smokers of two different types: one type wished to quit and did not have a family history of colon cancer risk, and the other type did not wish to quit and did have a family history of colon cancer in a first-degree relative. The students were to ascertain the patient’s readiness to quit smoking as well as their risk for cancer and, using shared decision making techniques, were to discuss these issues with the patient. Using the shared decision making model, students asked, advised, and assessed all patients of the benefits to quit smoking and their preferences for preventive care during the session. Standardized patients, who were ready to quit smoking, were provided the final 2 A’s (Figure 1). Student performance of the videotaped sessions was evaluated by trained...
faculty observers using a 30-point scale on shared decision making and smoking cessation for those standardized patients who were ready to quit smoking (Table 2). A minimum score of 70% was required to pass the family medicine clerkship. For comparability purposes, only those students whose standardized patients were ready to quit were included in the analysis (n=277). Similarly, a percentage-based scoring system was used to have the different point scales used across cohorts and campuses on the same metric.

After approval by the MSU Institutional Review Board, associations between student performance on standardized patients and the concurrent cognitive examinations were analyzed using standard statistical measures. The cognitive performance outcomes (multiple choice and oral exams) served as separate key response variables. The student performance on the standardized patients who were ready to quit smoking served as the main explanatory variables. Unadjusted and adjusted multi-linear regression was used to assess the relationship between each cognitive performance outcome (multiple choice and oral exam) and the standardized patient performance while controlling for potential confounders such as gender, campus location, and sequence of the clerkship (fall, spring, and summer).

We decided to stratify the analysis by cohort because of changes over time on the cognitive performance exams, oral and multiple choice (see Table 3). Moreover, we determined that combining both cohorts was not appropriate because of changes on the assessment of students’ performance on the standardized patient.

Results
Table 3 presents a description of the study sample on selected characteristics and a statistical comparison of the two study cohorts on those variables. Females represent 58% of the

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Table 2: Smoking Cessation and Screening/Prevention Grading Schema for Cohort 1 and Cohort 2

<table>
<thead>
<tr>
<th>Question</th>
<th>Points Allotted</th>
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<th>Points Allotted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td></td>
<td>Cohort 2</td>
<td></td>
</tr>
<tr>
<td>Opens interview/visit satisfactorily</td>
<td>1</td>
<td>Addresses patient’s concerns about smoking cessation</td>
<td>2</td>
</tr>
<tr>
<td>Shows interest in how smoking affects patient’s personal life</td>
<td>1</td>
<td>Discusses patient’s role in shared decision making</td>
<td>3</td>
</tr>
<tr>
<td>Interview flowed smoothly</td>
<td>1</td>
<td>Review of screening issue under discussion, risk factors, and value of screening</td>
<td>2</td>
</tr>
<tr>
<td>Asks about smoking history</td>
<td>1</td>
<td>Exploration of patient preference for screening</td>
<td>1</td>
</tr>
<tr>
<td>Asks about willingness to quit</td>
<td>1</td>
<td>Appropriate problem list created based on patient information given</td>
<td>5</td>
</tr>
<tr>
<td>Advises patient to quit with a clear, personalized message</td>
<td>1</td>
<td>Total points possible</td>
<td>10</td>
</tr>
<tr>
<td>Assists patient with setting a quit date</td>
<td>1</td>
<td>Total points possible</td>
<td>30</td>
</tr>
<tr>
<td>Assists patient in choosing strategies to prevent slips and relapses</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assists patient in the use of pharmacotherapy to buffer physical withdrawal</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arranges scheduled follow-up within 1 week from quit date</td>
<td>1</td>
<td></td>
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Results
Table 3 presents a description of the study sample on selected characteristics and a statistical comparison of the two study cohorts on those variables. Females represent 58% of the
study sample. No gender differences were found between our study cohorts. In contrast, cohort differences were found for mean multiple choice and oral exam scores. However, no differences between cohorts were found for mean problem-based assessment score. More than 90% of the students were able to successfully pass the standardized assessments for both Cohorts 1 and 2 with the minimum passing score of 70%.

Separate linear regression analyses were performed for Cohort 1 and Cohort 2 to determine if standardized patient performance scores were related to cognitive exams scores (multiple choice and oral) (see Table 4). After adjusting for gender, campus site, and clerkship sequence, the standardized patient scores were positively and strongly associated with the multiple choice exam scores in Cohort 1 but not in Cohort 2.

Conclusions and Discussion
These findings provide empirical evidence that trained medical students can perform smoking cessation counseling based on national guidelines with high levels of consistency across multiple community campuses as evaluated by observed standardized patient assessments. The performance of students did not differ by student cohort given a straightforward, simple case on smoking cessation versus more complex cases requiring shared decision making on preventive care as well as smoking cessation. The incorporation of both training on smoking cessation counseling and a high stakes observed performance assessment into a family medicine clerkship is not only achievable but also sustainable over time.

The secondary conclusion of this study of a large cohort of medical students is that student performance using standardized patients to demonstrate skill in providing smoking cessation is not consistently associated with performance on cognitive written or oral examinations taken concurrently during a clinical clerkship in family medicine. Table 4 shows that students' performance on the standardized assessment for smoking cessation in Cohort 1 was associated with their performance on other examinations (multiple choice and oral) during the same clerkship. For Cohort 2, who performed a shared decision making approach

| Table 3: Selected Characteristics of the Study Sample and Stratified by Cohort |
|---------------------------------|-----------------|-----------------|-----------------|-------|
|                                  | Total           | Cohort 1        | Cohort 2        | P Value |
| Gender (%)                       |                 |                 |                 |       |
| Male                             | 42.3            | 43.4            | 40.3            | .444 |
| Campus (%)                       |                 |                 |                 | .002 |
| Flint                            | 19.5            | 21.7            | 22.7            |       |
| Grand Rapids                     | 26.1            | 26.2            | 26.0            |       |
| Kalamazoo                        | 17.9            | 17.9            | 18.1            |       |
| Lansing                          | 17.0            | 16.2            | 18.4            |       |
| Saginaw                          | 12.2            | 15.7            | 6.1             |       |
| Upper Peninsula                  | 7.2             | 6.4             | 8.7             |       |
| Multiple choice exam (x ± SD)*   | 82.5 (7.6)      | 81.4 (8.1)      | 84.4 (6.5)      | < .001 |
| Oral exam (x ± SD)*              | 83.9 (10.6)     | 85.6 (10.7)     | 80.5 (9.6)      | < .001 |
| Performance-based score (x ± SD)*| 89.8 (7.7)      | 90.0 (7.6)      | 89.7 (7.8)      | .627 |

* Percentage-based score

| Table 4: Unadjusted and Adjusted Estimates of the Association Between Problem-based Score and Cognitive Exams |
|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| Cognitive Exams                                    | Cohort 1                                             | Cohort 2                                             |
|                                                    | Unadjusted   | P Value | Adjusted*   | P Value | Unadjusted | P Value | Adjusted*   | P Value |
| Coefficients                                       | β            |         | β           |         | β          |         | β           |         |
| Multiple choice exam                                | 0.24         | <.001   | 0.24         | <.001   | 0.10       | 0.049   | 0.08        | 0.127   |
| Oral exam                                          | 0.21         | .001    | 0.26         | <.001   | 0.21       | 0.010   | 0.26        | .001    |

* Adjusted for gender, campus, and clerkship sequence
on the standardized assessment, performance was only associated with the oral exam and not the multiple choice performance. Our data show that medical students can achieve high levels of performance in smoking cessation counseling even in a real-world simulation where patients set priorities and share with their physician the decision to either take action or not related to a behavior change. These findings further substantiate a need for broadening the range of assessing student competency beyond cognitive evaluation alone, especially skills in domains requiring communication or right brain skills.

A key limitation of this study is that we were forced to analyze the two cohorts separately, since we changed the standardized performance for Cohort 2 to include a shared decision making approach. The cohorts, however, did not differ on their overall performance in smoking cessation counseling with mean adjusted scores (Table 4). Both cohorts were sizable, allowing robustness of the analysis. We did not have IRB permission to compare the student standardized patient performance to other cognitive tests such as the MCAT or scores in other clerkships. All evaluations were controlled and administered during the family medicine clerkship with performance assessments observed by trained faculty. The study did not focus on long-term follow-up to assess whether students carried their performance skills into future practice.

This report of a large cohort on medical students’ performance in smoking cessation interventions with standardized patients encourages the development of other performance assessments relevant to direct patient care. Due to the overwhelming risk of tobacco use and the clear benefits of smoking cessation, expecting medical students to pass a high stakes simulation on smoking cessation counseling should be required of all medical students. This report shows that medical students can consistently achieve high levels of smoking cessation counseling with standardized patients, regardless of the complexity of shared decision making approach or performance on other concurrent examinations. Future studies could use similar methodology to determine whether other standardized assessments are associated with cognitive examinations, assess the face validity of overt versus covert assessments by simulated patients, evaluate the validity of faculty examiners versus simulated patient examiners, and include longitudinal follow-up to determine whether performance skills remain durable over time into actual clinical practice.

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References