Long-term Retention of Smoking Cessation Counseling Skills Learned in the First Year of Medical School

Lynn Y. Kosowicz, MD^{1,2}, Carol A. Pfeiffer, PhD¹, and Maximilian Vargas¹

¹University of Connecticut School of Medicine, Farmington, Connecticut 06030, USA; ²University of Connecticut Health Center MC-2824, 263 Farmington Avenue, Farmington, Connecticut 06030, USA.

BACKGROUND: Tobacco use is a significant cause of preventable morbidity and mortality in the United States, yet clinicians underutilize smoking cessation counseling. Medical schools are increasingly including training for smoking cessation skills in preclinical curricula. Information about long-term retention of these skills is needed.

OBJECTIVE: To assess retention of smoking cessation counseling skills learned in the first year of medical school.

DESIGN: Retrospective review of data collected for routine student and curriculum assessment.

PARTICIPANTS: Two cohorts of medical students at the University of Connecticut School of Medicine (total N=112) in 1999–2001 and 2002–2004.

MEASUREMENTS AND MAIN RESULTS: Scores by standardized patients were compared from first and fourth-year assessments, based on checklist items corresponding to the 5 strategies recommended by the U.S. Public Health Service (Ask, Advise, Assess, Assist, Arrange). In study cases, 97% of first-year students “asked” about smoking and retained this skill in fourth year ($p=.08$). Ninety-four percent of first-year students “assessed” readiness to quit and retained this skill ($p=.21$). Ninety-six percent of first-year students “advised” smokers to quit and retained this skill ($p=.18$). Eighty-six percent of first year students “assisted” smokers in quitting and retained this skill ($p=0.10$). Eighty-one percent of first year students “arranged” follow-up contact and performance of this strategy improved in the fourth year to 91% ($p=.03$).

CONCLUSIONS: Smoking cessation counseling skills demonstrated by first year medical students were, with brief formal reinforcement in the third year, well retained into the fourth year of medical school. It is appropriate to begin this training early in medical education.

KEY WORDS: smoking cessation; medical education-communication skills; medical education-undergraduate; medical education-curriculum; clinical skills assessment.

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BACKGROUND

Several studies have documented a gap between what is known to be good care and the care that is actually provided to patients.^{1–4} It is essential that new approaches are developed to close that gap, including increased efforts in undergraduate medical education to teach provider behaviors that have been proven to have a positive impact on health outcomes.^{5–7} Healthy People 2010 lists tobacco use as a major health concern in the United States and delineates objectives that include an increase in the proportion of persons counseled about smoking cessation.⁸ The U.S. Preventive Services Task Force strongly recommends that clinicians screen all adults for tobacco use and provide tobacco cessation interventions.⁹ The U.S. Public Health Service published a guideline to help clinicians in this effort through brief interventions with 5 specific strategies, referred to as the “5 A’s” (Ask, Advise, Assess, Assist, and Arrange).¹⁰ Yet, despite these and other public health initiatives, smoking cessation counseling continues to be underutilized by clinicians.^{2,11–13}

Increasingly, U.S. medical schools are including training for tobacco intervention in their curricula.^{14–18} A recent review of training methods for tobacco intervention in undergraduate medical education concluded that, although effective educational methods have been described, deficits still exist in applying this training and little long-term data exist showing that such training is retained.¹⁶ Early training in medical school may be optimal, when clinical practice patterns are first being formed. However, teaching these skills early may be problematic as some skills, particularly communication skills, have been shown to decline in future years.¹⁹

In this study, we assessed how effectively 2 cohorts of first-year students performed smoking cessation counseling skills with standardized patients (SPs) and determined whether individual students retained these skills into their fourth year of medical school.

METHODS

Subjects and Intervention

The sample consisted of all 151 fourth-year medical students who took the mandatory clinical skills assessment at the University of Connecticut School of Medicine during the years 2002 (cohort 1, N=76) and 2004 (cohort 2, N=75). A majority (total N=112) was available for the longitudinal comparison of Year 1 and Year 4 performance. Those who were excluded did not complete the curriculum in 4 years, primarily because of

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leaves taken to complete other graduate degrees. Data from 2003 were not included because the SP for the smoking case did not meet our criteria for interrater reliability (>80%). The University of Connecticut Health Center Institutional Review Board gave approval with exempt status for this retrospective study.

Students were first introduced to a smoking cessation curriculum during their first year of medical school as part of the Principles of Clinical Medicine (PCM) course. This course meets 1 afternoon per week with a focus on the elements of clinical encounters, personal wellness, and professionalism. For the smoking cessation curriculum, students attended a 1-hour didactic session on the "Stanford Model of Behavioral Change"²⁰ to provide a framework for helping patients to change their behavior. A few weeks later, students were assigned readings that reviewed clinical practice guidelines for smoking cessation counseling before a 1.5-hour didactic session on this topic. This was followed by 45 minutes of small group discussion and role-play. In 2 subsequent formative clinical skills assessment sessions, each student was asked to perform smoking cessation counseling with 2 different SPs. These students also completed a summative assessment of their clinical skills at the end of the year, which included a smoking cessation case. In addition, students were encouraged to practice their smoking cessation skills at their Student Continuity Practice, where they worked with a generalist physician seeing patients one half-day per week for the first 3 years of medical school. In their third year Family Medicine ambulatory rotation, students were encouraged to identify tobacco use as a risk factor for cardiovascular disease in a case-based teaching session and to review the evidence for efficacy of a brief office intervention. In total, the curricular time devoted to smoking cessation counseling was approximately 4 hours in Year 1 and less than 1 hour in Year 3, which is comparable to the time allotted at a majority of schools,^{15,16} but less than has been recommended by some experts.¹⁴

Data Collection

The cases used for analysis were from 3 clinical skills assessments that students completed during the first year and 1 fourth-year assessment. All standardized patient encounters that included a checklist item for asking about smoking were analyzed for the frequency students ask this question regardless of presenting complaint.

Further analysis was conducted on the 4 cases where smoking cessation was an expected task. These cases had specific checklist items corresponding to the 5 A's of smoking cessation counseling.

Year 1

1. The first session included a case ("Case A" in Table 2) in which the patient presented for a health maintenance visit. Students were given 40 minutes to take a complete medical history and counsel the patient about his or her smoking. Each student worked with 1 of 4 SPs.
2. In the second session, students were given 15 minutes to obtain a focused history and counsel a patient ("Case B") who presented with concerns about cardiovascular risk (the main

risk was smoking, which the students needed to identify and address). Each student worked with 1 of 2 SPs.

3. At the end of the year, students completed a 7-case assessment, in which 1 case was designed specifically to document acceptable smoking cessation counseling skills ("Case C"). All students within the same cohort saw the same SP for the assessment.

Students received feedback from the SPs immediately after completing the encounters and later from faculty observers during the PCM class time.

Year 4

As a graduation requirement, students were required to pass an assessment involving 14 standardized patient encounters, 1 of which was designed to specifically reassess smoking cessation counseling skills ("Case D"). Students were given 20 minutes to take a focused history and counsel a patient with a cough (asthma exacerbation precipitated by smoking). All students within the same cohort saw the same SP for the assessment.

Checklists were developed to match the Stanford model used in teaching smoking cessation counseling. The SP scored the student's performance after the student had completed the encounter. SPs were given 6 hours of training that involved rating a set of standard videotaped encounters and comparing their scores to other SPs' and to the gold standard for the tape. The mean interrater agreement was 92%.

Analysis

Relevant checklist items were categorized as "Ask", "Advise", "Assess", "Assist" or "Arrange", according to the 5 A's in the U.S. Public Health Service guidelines. Students who determined whether the patient used tobacco products were recorded as having asked. Students who advised a smoker to quit were recorded as having advised. Students who determined the patient's interest in quitting were recorded as having assessed readiness. There were several checklist items which could be categorized as "Assist" and these were further subcategorized for those ready to quit as: setting smoking cessation date, discussing pharmacologic therapy, and offering psychosocial support. The threshold for having adequately assisted is not known. It was felt that a minimum of 2 of the 3 subcategories should be addressed to receive credit for the Assist strategy. If the patient was not ready to quit, but the student discussed benefits and barriers, provided resources, asked if the patient would be willing to readdress in the future, or offered availability when the smoker was ready, the student was recorded as having assisted. Students who arranged follow-up contact were recorded as having arranged.

Frequencies for performance of each strategy for the 4 cases were then calculated. Student's *t* test was used to compare an individual's performance in the first to the fourth year. Data analysis, including calculations of frequencies and Student's *t* tests, was performed with SPSS 11.5, 2004 software (SPSS, Inc., Chicago, IL). Results were considered statistically significant when $p < .05$.

RESULTS

Table 1 shows the frequency that first and fourth-year students asked about smoking for those cases where smoking cessation counseling was not a focus of the encounter. Fourth-year students asked less frequently than first-year students. However, a large majority of students consistently asked a smoking history of the SPs even when smoking was not a focus of the encounter.

The data for the 5 strategies (the 5 A's) of smoking cessation counseling in cases where smoking cessation was an expected task are presented in Table 2 for the combined cohorts.

The data are consistent for the first 3 A's. Over 90% of students asked about smoking, advised the patient to quit, and assessed readiness to do so. The data are less consistent for assisting and arranging follow up, but a majority of students took those steps in counseling about smoking cessation for patients interested in quitting.

Tracking individual student performance from Year 1 to Year 4 allowed us to use paired *t* tests for each of the 5 A's (Table 3). Performance of the Ask, Assess, and Advise strategies was high in Year 1 and remained high in Year 4. There was a decline in performance of the Assist strategy, which does not reach statistical significance; however, performance of the Arrange strategy increased significantly.

DISCUSSION

Provider skill in smoking cessation counseling is influential in achieving a reduction in tobacco use.^{2,4,8,9} Curricula that enhance the ability of clinicians to provide smoking cessation counseling can therefore be expected to have a positive impact on future health outcomes if those skills are retained. The National Action Plan for Tobacco Cessation recommended that competency in tobacco dependence interventions be a core graduation requirement for all new physicians.^{18,21} As medical schools increasingly incorporate smoking cessation counseling curricula and assessments, it is important to have evidence to demonstrate that counseling skills are retained. It has previously been demonstrated that first-year medical students can effectively learn smoking cessation counseling skills through enhanced curricula,^{22,23} but retention has been less well studied. Prochaska et al¹⁷ recently showed that most of their third year students, after 4 hours of training in first year and 1 hour in third year, asked, assessed, and advised smokers, but were less proficient in assisting and arranging a follow-

Table 2. Percent of Students Successfully Completing Each of the 5A's for Smoking Cessation Counseling with Standardized Patients for the Three Cases in Year One and the One Case in Year Four, University of Connecticut School of Medicine, 1999–2001 and 2002–2004

Student year and SP* case (N)	% completing the strategy				
	Ask	Advise	Assess	Assist	Arrange
Year 1 Case A (112)	97	97	93	85	81
Year 1 Case B (147)	96	95	93	61	NR†
Year 1 Case C (152)	98	97	97	97	78
Year 4 Case D (112)	100	99	97	76	90

*Standardized Patient

†Not Recorded in this case, patient in precontemplation

up visit. In contrast, our study is one of the first to demonstrate retention of, and in some domains improvement in, smoking cessation intervention skills over the 4 years of medical school.

The skills of students in their first and fourth years of medical school were measured by performance of the "5 A's" (Ask, Advise, Assess, Assist, Arrange) during standardized patient encounters. The strong performance of the first-year students was well retained with brief formal reinforcement in the curriculum in the clinical years. The only statistically significant difference noted between a student's performance in their first versus their fourth year on the smoking cessation cases was improvement in arranging follow up. Fourth-year students were significantly more likely to arrange follow up, which may in part reflect more experience with longitudinal patient care. Unexpectedly, there was a downward trend (not statistically significant) from first to fourth year in assisting patients to quit. Further analysis comparing components of the Assist item (setting a stop date, discussing pharmacologic therapies, and discussing psychosocial support) may provide insight into how to enhance this skill over the 4 years.

Interpretation of data from cases without a smoking cessation focus (Table 1) is difficult because of the difference in context and complexity of tasks for those cases. The scenario for first year students usually involved a patient presenting to a primary care office in which the task was to take a history or

Table 1. Frequency of First and Fourth-Year Medical Students Asking Standardized Patients about Smoking when Cessation Counseling was not a Focus of the Encounter, University of Connecticut School of Medicine, 1999–2001 and 2002–2004

Student year	Percent (N) asking about smoking		
	Cohort 1	Cohort 2	Combined
Year 1	100 (77)	97 (72)	98* (149)
Year 4	79 (66)	84 (53)	81* (118)

*Difference significant at the $p < .05$ level

Table 3. Percent of Students Successfully Completing Each Smoking Cessation Strategy by Year in Medical School, University of Connecticut School of Medicine, 1999–2001 and 2002–2004

Counseling strategy	Percent of students successfully completing the strategy (N=112 from the combined cohorts)		
	Year 1	Year 4	Paired <i>t</i> test <i>p</i> value
Ask	97	100	.083
Assess	94	97	.207
Advise	96	99	.181
Assist	86	77	.096
Arrange	81	91	.027*

*Significant at the $p < .05$ level

counsel the patient, or both. For fourth-year students, the scenarios included other settings, such as the emergency department, and in the same time allotted student tasks usually included a focused physical examination. Asking about smoking was performed by nearly all students in Year 1 and, although there was some decline, it was still quite prevalent in Year 4. Further analysis of the fourth-year cases might be useful in determining the conditions under which the students are more likely to ask/not ask patients about smoking and curricular interventions could be designed to improve the frequency of asking.

This study has several limitations. It was conducted at 1 New England medical school. Several schools have smoking cessation curricula in the preclinical years and these findings are likely generalizable, but additional studies are needed at other institutions. The lack of a control group makes it difficult to identify which parts of the curriculum contribute to the retention of skills. In other studies, reinforcement in clinical rotations has been demonstrated to be important to the performance of skills learned in preclinical years.^{17,24} Identical scenarios were used for students at the same level, but variability was introduced by the use of different standardized patients for the 2 cohorts. In the opening scenarios for several of the SP encounters, students were prompted to counsel the patients (although not necessarily for smoking cessation). We documented that students usually ask about smoking and counsel patients when the presenting concern is a problem related to smoking. Further study is needed to document whether students counsel all smokers regardless of presentation. Another limitation is that it is not clear how well medical student performance in SP encounters correlates with performance in the clinical setting. Several studies with unannounced SPs in clinical settings have shown that SPs are infrequently recognized and performance with SPs and actual patients is comparable.^{25–27} In addition, a positive correlation between faculty performance with SPs in a testing center and performance with actual patients in the clinical setting has been demonstrated.²⁸ It is therefore reasonable to expect that medical student performance with these SPs is a valid predictor of their performance in a clinical setting. Finally, these students were followed to the fourth year of medical school. Effective methods need to be developed to follow learners longitudinally through residency and into practice to assess longer-term curricular effects on health outcomes.

In summary, this study examined smoking cessation skills in 2 cohorts of medical students in their first and fourth years during SP encounters. First-year students asked most patients about smoking, advised smokers to quit, assessed their readiness, provided assistance, and arranged follow-up contact, consistent with nationally published guidelines. These skills, with brief reinforcement in third year, were retained into the fourth year of medical school. Further studies are needed to correlate this good performance in SP assessments with actual patient encounters in clinical settings, and to assess longer-term retention through residency and beyond.

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Corresponding Author: Lynn Y. Kosowicz, MD; University of Connecticut Health Center MC-2824, 263 Farmington Avenue, Farmington, Connecticut 06030, USA (e-mail: Kosowicz@nso1.uhc.edu).

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