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Tobacco Dependence Treatment Teaching by Medical School Clerkship Preceptors: Survey Responses from more than 1,000 US Medical Students

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Abstract

Objective—To determine factors associated with tobacco cessation counseling in medical school clerkships

Methods—Third-year medical students at 10 medical schools across the United States completed a 100-item survey, measuring the frequency with which they experienced their preceptors' providing clinical teaching components: clear instruction, feedback, modeling behavior, setting clear objectives, and responding to questions about tobacco dependence counseling as well as frequency of use of tobacco prompts and office systems. Our primary dependent measure was student self-reported skill level for items of tobacco dependence treatment (e.g. "5As").

Results—Surveys were completed by 1213 students. For both family medicine and internal medicine clerkships, modeling and providing clear instruction on ways to provide tobacco counseling were reported most commonly. In contrast, providing feedback and clear objectives for tobacco dependence treatment lagged behind. Overall, students who reported preceptors' provision of optimal clinical teaching components and office system prompts in both family medicine and internal medicine clerkships had higher self-reported skill ($p < 0.001$) than students with no exposure or exposure during only one of the clerkships.

Conclusions—Future educational interventions intended to help students adopt effective tobacco dependence treatment techniques should be engineered to facilitate these critical precepting components.

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Introduction

Provision of tobacco dependence treatment at each medical visit for patients who smoke, including brief counseling using the 5As (Ask, Advise, Assess, Assist, Arrange), and provision of pharmacologic aids and follow-up, is advocated by numerous organizations. These include the Centers for Disease Control and Prevention (Best Practices for Comprehensive Tobacco Control Programs), the United States Public Health Service, and the American Association for Cancer Research.(CDC 2007, Fiore 2004, AACR 2012). Optimally, tobacco dependence counseling competencies should be taught and reinforced in the preclinical and clinical years of medical school (Geller, 2008) to help ensure that physicians develop the attitudes, knowledge, and skills needed to treat patients who use tobacco. Given this, the Subcommittee on Cessation of the Interagency Committee on Smoking and Health's National Action Plan for Tobacco Cessation called for medical schools to develop, implement, and evaluate curricula for tobacco dependence treatment. (Fiore, 2004).

Medical school clerkship preceptors in primary care are well positioned to help medical students develop tobacco dependence treatment skills. Consistent observation, provision of feedback, and modeling by preceptors reinforces pre-clinical instruction. (Aspergren,2005) Growing evidence indicates that the quality of teaching during clinical clerkships is an important predictor of medical students' learning outcomes. (Hamdy, 2006) Students exposed to good teachers score higher on clerkship examinations, and National Board of Medical Examiners Step 2 examinations, and perform better overall in clerkships. (Kies, 2010) Studies of clinical teaching have demonstrated that feedback is an important aspect of students' learning. (Cantillon, 2008) Observations of community-based faculty, however, revealed that feedback to students was provided in only 25% of encounters. (Torre, 2005)

Given the relationship between clinical teaching and student skill level, we hypothesized that participation in clinical teaching for tobacco dependence treatment during internal medicine and family medicine clerkships compared to participation in only one clerkship or in neither clerkship would be associated with greater self-reported student skill scores. Therefore, we assessed students' reports of preceptors' clinical teaching and their exposure to office systems to determine whether these factors were associated with higher reported skill scores. These data provide an estimate of tobacco dependence preceptor teaching activity as reported by students, and provide insights into new initiatives that may enhance clinical precepting.

Methods

Participating Schools

The randomized control trial (RCT) for Smoking Cessation in 10 Medical Schools (called the MSQuit study), funded by the National Cancer Institute, is designed to compare two different educational approaches to teach medical students how to provide tobacco dependence treatment (i.e. counseling and pharmacotherapy treatment).

Participating medical schools are: Creighton University School of Medicine, Georgetown University School of Medicine, Louisiana State University Health Science Center-Shreveport, University of Alabama-Birmingham, University of Iowa Carver College of Medicine, University of Kentucky College of Medicine, University of Louisville School of Medicine, University of Minnesota Medical School, University of Pennsylvania, and Stanford University School of Medicine. Three of the ten schools participated in an earlier study of tobacco dependence treatment training in medical schools; the other 7 were recruited through networks with colleagues. Schools were both private (n=3) and public

(n=7), geographically diverse and located in inner-city areas as well as outlying areas. Five of the schools are in states with higher than national average rates of tobacco use. The site investigators are faculty in Departments of Medicine or Family Medicine (n=7) or in the Offices of the Dean or Curriculum Development (n=3). The Institutional Review Boards at each university approved or exempted the data collection protocol. Third year students completed the survey between November 2009 and May 2010 in the classroom, online, or a combination of both. The overall response rate was 82.1%, however the response rate varied by whether the survey was administered in the classroom (92.6%), online (79.5%), or both (one school, 49%). The survey took 13 to 15 minutes to complete.

Measures

The self-administered survey included more than 100 questions built on content and format used in previous research. (Geller, 2008) Questions were pilot tested for ease of understanding with third-year medical students from the University of Massachusetts Medical School and the results helped refine the survey used in this study.

Measures of student personal characteristics included demographics: age, gender, class year, career preference; and clerkships completed: family medicine or internal medicine or both. Measures of components of *clinical teaching* included student's level of agreement (1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree) on how often their preceptors did the following during their clerkships: a) provided clear instruction on ways to deliver tobacco dependence counseling to patients; b) provided feedback on tobacco dependence counseling; c) modeled ways to provide tobacco dependence counseling; d) outlined clear objectives for tobacco dependence counseling such as the number of smokers with whom one should interact; e) responded to questions about tobacco dependence counseling in the final review with students. Also included are questions to assess *office systems*: the presence of a place in the preceptor's record that reminded staff to advise patients to quit smoking; and whether there were educational materials for patients about smoking cessation prominently displayed in the preceptor's office. In order to account for those students who had not yet attended either family medicine or internal medicine clerkships, or students who did not agree with any of the 7 items, we developed scoring using the following scoring rubric. Separate family medicine and internal medicine clinical preceptor scores were created by summing the number of agree or strongly agree responses to each of the 7 items. To differentiate between those students who did not agree with any of the items and those who had not yet completed the clerkship, the number one was added to the total score and students who did not have the clerkship were assigned a total score of zero. The scores for family medicine and internal medicine preceptors ranged from zero to 8.

Outcome variables

The primary dependent measure was student self-reported skill level for 6 items of tobacco dependence treatment: a) asking about smoking at every visit, b) advising smokers to quit, c) assessing smokers' willingness to quit, d) assisting smokers to develop a quit plan, e) arranging follow-up contact regarding smoking cessation, and f) discussing pharmacotherapy options and use. Scores were reported on a four-point scale ranging from not at all skilled to very skilled. These responses were assigned a score of 0=not at all skilled, 1=somewhat skilled, 2=moderately skilled, and 3=very skilled. Skill scores were totaled, and ranged from a low of 0 for not at all skilled to a high of 18 for reporting very skilled for all 6 items. Students also were asked the number of opportunities that they had to implement tobacco dependence counseling with their patients, ranging from no patients to more than 25 patients.

Statistical analysis

The proportion of respondents stating that they strongly disagreed, disagreed, agreed, and strongly agreed was estimated for each of the five clinical teaching items and the two office system items. Rates of responses were compared between clerkships (family medicine versus Internal medicine) using multinomial logistic regression adjusting for age and gender and using robust variance estimators to adjust for multiple answers from the same students for students completing both clerkships.

The association between student skill score and family medicine preceptor score and internal medicine preceptor score was estimated and tested using mixed model linear regression with school as a random effect to account for positive intraclass correlation in the data.

Preliminary analysis indicated that the unadjusted ICC for the outcome variable was 0.04 [95% CI: 0.01–0.11]. Graphical examination of the association using lowess curves (Cleveland, 1993) indicated a linear association was appropriate. Models were again adjusted for gender and age. The interaction of the two preceptor scores was estimated and tested.

All statistical analyses were done using Stata 12 (StataCorp LP, College Station, TX).

Results

Surveys were completed by 1,213 third-year students at 10 schools of whom 1148 had complete data on gender and clerkship. Slightly more than half of the students were male and the mean age was 26 years. At the time of survey administration, the percentage of students reporting completion of: the internal medicine only (25%); family medicine only (13%); both clerkships (41%); and neither was 21%. Self-reported skills of moderate to very skilled for tobacco dependence treatment were highest for asking about smoking (75%) and lowest for arranging follow-up contact (30%) (Table 1). Sixty-six percent of students reported advising at least 10 patients to quit smoking and 57% had assessed willingness to quit smoking with at least 10 patients.

Clinical teaching - family medicine vs. internal medicine clerkships

For each component of clinical teaching, students reported higher levels of agreement for family medicine preceptors compared to internal medicine preceptors (Table 2; $p < 0.001$). During family medicine clerkships, modeling (69% strongly agree or agree) and providing clear instruction on ways to provide counseling (62%) were the most commonly reported forms of teaching. In contrast, providing feedback (30%) and clear objectives for tobacco dependence treatment such as the number of smokers with whom one should interact (24%) lagged behind. A similar pattern was seen in the internal medicine clerkship, modeling (47%) was the most common form of teaching reported by students followed by clear instruction (39%); clear objectives for tobacco dependence treatment (16%) and feedback (16%) were less commonly provided.

Office systems

During family medicine clerkships, 62% of students observed that educational materials were predominantly displayed in their preceptor's office and 40% observed a place on their preceptor's records to note "advised patients to quit smoking" (Table 2). During internal medicine clerkships, 35% of students observed that educational materials were predominantly displayed in their preceptor's office and 28% observed a place on their preceptor's records to note "advised patients to quit smoking".

Associations between clinical teaching/office systems and student self-reported tobacco dependence treatment skill

Students completing both family medicine and internal medicine clerkships had higher mean tobacco dependence treatment skill scores ($M = 9.66$; 95% CI 7,15) than students completing only family medicine ($M = 9.12$; 95% CI 7,15), or only internal medicine ($M = 8.46$; 95% CI 6,14), or neither ($M = 8.06$; 95% CI 6,14, $p < .001$). Students completing family medicine clerkships reported higher preceptor teaching scores (2.32 out of 8) compared with these scores for internal medicine clerkships alone (2.01), $p < 0.001$ (data not shown).

A regression model estimated the association of student tobacco dependence treatment skill scores with preceptor scores for family and internal medicine. Coefficients from the model are shown in Table 3. Results show that increases in total student skill score is associated with increases in preceptor score and this effect is similar for both family and internal medicine clerkships. A significant interaction ($p < .001$) was seen such that when added to the model, the interaction term family medicine preceptor score*internal medicine preceptor score was significant ($p < 0.001$). The negative coefficient indicates that the effect of one clerkship or “preceptor” score is ‘diminished’ for those with a higher score in the other clerkship. Student age had no effect on skill score and female students had lower skill scores. Figure 1 illustrates the linear rise in the student skill score as the number of positive responses for the combined preceptor communication/environment increases for family medicine and internal medicine (unadjusted associations).

Discussion

Using a model for ideal clinical teaching (Brooks, 2007) two major points emerged from this analysis of third-year medical students across the nation. First, an apparent dose-response relationship was observed. Students who report receiving clinical teaching regarding tobacco dependence treatment and an exposure to office systems promoting cessation in both family medicine and internal medicine clerkships had the highest self-reported tobacco treatment skills. Second, in both family medicine and internal medicine clerkships, third-year students were more likely to state that their preceptors modeled skills and gave them clear instruction compared with provision of feedback or clear objectives. Strikingly, only 30% of students in family medicine and 16% of students in internal medicine reported receiving feedback on their performance of tobacco treatment skills with patients while even fewer reported receiving clear objectives from their preceptors for tobacco dependence counseling.

Preceptors can play a critical role in teaching medical students how to provide tobacco treatment during their clerkships through use of modeling, provision of feedback, and setting clear treatment objectives. Modeling is a time-honored and invaluable method for helping students to develop values, attitudes, and behaviors associated with prevention practices. (Irby, 2004) Providing feedback that is consistent, supportive, timely, and linked to specific student behaviors is a challenging but essential role for preceptors. (Usatine, 1997, Sostock, 2002) While medical students rate preceptor interaction as the most important factor for preceptors, (Schultz, 2004) in another setting, demonstrating clear objectives was rated more highly than availability of learning resources, office management skills, and clinic setup items. (Delva, 2005)

An earlier study in a pediatric clerkship found that smoking assessments were more commonly reported when students noted that their preceptor modeled a family interaction about smoking prevention, observed the student interacting with a family about smoking prevention, and provided clear expectations and feedback about these interactions. (Geller, 2005) Conversely, in the same study, more general, nonspecific setting of educational objectives was not associated (Geller, 2005) with smoking prevention counseling among

students. Thus it is noteworthy that receipt of specific training objectives noted in this study such as the number of times a student should interact with patients who smoke was strongly associated with higher self-reported tobacco treatment scores.

Improving preceptors' teaching of the 5As is key to creating an optimal environment for students to develop skills regarding tobacco dependence treatment. Meredith and colleagues found that primary care physicians who endorse tobacco treatment counseling and referrals provide more treatment recommendations and have higher patient quit rates. (Meredith, 2005) A number of national studies of physicians indicate fairly broad uptake of 'asking' and assessing' while assisting and arranging follow-up care often lag behind. (Quinn, 2005) It is likely not a coincidence that only 32% of students herein reported that their preceptors had instructed them how to make a referral for tobacco treatment services and that a similar low number (29%) reported having only a modest skill for arranging follow-up care.

Overall, our data suggest that operationalizing the component parts of ideal preceptor-student teaching can improve student's self-reported skills for tobacco treatment. First, students must have multiple opportunities for practice and receive feedback. Consistent with studies that show high rates of medical care utilization among patients who smoke, many third-year students in this study reported having multiple opportunities to interact with patients who smoke. Second, the role of the preceptor is fundamental, particularly with regard to modeling tobacco dependence treatment behavior. An earlier qualitative analysis of final year medical students found 70% reporting that active observation of an experienced family physician performing a clinical task was the most significant educational experience during their clerkship. (Epstein, 1998)

However, relying on only observation may be inadequate for medical students in the beginning stages of patient counseling. Epstein and colleagues have argued for a multi-staged interconnected process by which organized observation is the preceptor's first task. Namely, they suggest a process of creating an educational environment in which the preceptor becomes aware of learning possibilities by asking students what they have observed. This question is followed by a thorough review to determine incidents that were particularly educational to further define the student's learning needs, culminating in the joint development of a plan to help the student generalize from these experiences, and be alert to the crucial subjective and emotional aspects of the educational experience. (Epstein, 1998)

However, Teherani and colleagues have reported that teaching in ambulatory care settings is commonly characterized by brief student-faculty interactions focusing on management and treatment rather than teaching and feedback. (Teherani, 2009) This may be attributed to the perception that provision of feedback and other types of mentoring adds a time burden to a preceptor's busy schedule. (Teherani, 2009) One study among preceptors found that 3.3 minutes per patient encounter were used for student charting; yet only 3.8 minutes (2.2 minutes for listening to student presentations, 1.6 minutes for teaching) were added to the overall time to precept the student. Overall, only half a minute per patient was added when a student is involved. (Usatine, 2000)

Our study has a number of strengths including a relatively high response rate from students at 10 medical schools representing most US geographic regions, including states with high smoking rates. In addition, our measures of students' experiences with their preceptors have been used in an earlier observational study that measured preceptor-student clinical teaching for tobacco treatment skills. (Brooks, 2007) We aimed to examine clerkship experiences and differences between family medicine and internal medicine, which we anticipated were the two clerkships most commonly addressing the consequences of smoking.

We recognize a number of limitations in this study. First, this survey was based on self-report and many questions about smoking may have led to an over-estimation bias. Student report of preceptor's clinical teaching was entirely subjective-no independent observation of preceptors or use of physician or patient records were available but student report of low skill levels for assisting patients and arranging follow-up are consistent with those of practicing physicians (Quinn, 2005). In a pilot study in a pediatric clerkship, with the use of an observer, student self-report appeared to be a valid measure of smoking assessment and counseling practices (Brooks 2007). In our current, MsQuit study, students at all 10 schools are participating in a tobacco case as part of the school's Observed Structured Clinical Examination (OSCE). Comparisons between self-report and OSCEs will be forthcoming. We also lacked information on the sequence of clerkships; thus, we cannot determine if one clerkship is more likely than others to 'prime' students for ideal preceptor-student clinical teaching or report higher skill-level. Also, students were not randomized to the clerkship distribution so we cannot separate the effects that may have occurred for students receiving both clerkships from selected factors that may have made these students different. Finally, given the cross-sectional nature of this study, we cannot infer a cause and effect between student clerkship experiences and skill score. A student's high self-reported skill level and counseling behavior is likely to impact their preceptor's teaching style and counseling behavior and vice versa.

Conclusions

Our findings suggest that although high teaching scores are associated with greater student self-reported skills, many preceptors across these medical schools do not consistently provide clinical feedback or set objectives. Opportunities to structure the clerkship preceptorship could greatly enhance medical schools' curriculum in tobacco dependence counseling. The inextricable connection between optimal clinical teaching and provision of office prompts affords students an opportunity to learn lifelong tobacco cessation skills. We have combined these elements into an in-person Academic Detailing model for preceptors at 5 intervention schools in the MsQuit study. Future studies should test and compare various methods for teaching behavioral change counseling skills to students and preceptors.

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References

1. American Association of Cancer Research . [Accessed November 1, 2012] <http://www.aacr.org/home/public--media/science-policy--government-affairs/aacr-policy-documents,-letters--position-statements/smoking-and-lung-cancer.aspx>
2. Aspegren K, Lønberg-Madsen P. Which basic communication skills in medicine are learnt spontaneously and which need to be taught and trained? *Med Teach*. 2005; 27:539–43. [PubMed: 16199362]
3. Brooks KR, Siegel B, Lash TL, Geller AC, Fitzgerald A, Tracy C, Prout MN. Validating medical students' self-report of smoking-related communication skills and educational experiences. *Ambul Pediatr*. 2007; 7:187–91. [PubMed: 17368415]
4. Cantillon P, Sargeant J. Giving feedback in clinical settings. *BMJ*. 2008; 10; 337:a1961.10.1136/bmj.a1961
5. Centers for Disease Control and Prevention. [Accessed November 1, 2012] Best Practices for Tobacco Control Practices. http://www.cdc.gov/tobacco/stateandcommunity/best_practices/pdfs/2007/BestPractices_Complete.pdf
6. Cleveland, WS. Visualizing Data. Hobart Press; Summit, NJ: 1993.

7. Delva MD, Schultz KW, Kirby JR, Godwin M. Ambulatory teaching: do approaches to learning predict the site and preceptor characteristics valued by clerks and residents in the ambulatory setting? *BMC Med Educ.* 2005; 5:35. [PubMed: 16225666]
8. Epstein RM, Cole DR, Gawinski BA, Piotrowski-Lee S, Ruddy NB. How students learn from community-based preceptors. *Arch Fam Med.* 1998; 7:149–54. [PubMed: 9519920]
9. Fiore MC, Croyle RT, Curry SJ, Cutler CM, Davis RM, Gordon C, Healton C, Koh HK, Orleans CT, Richling D, Satcher D, Seffrin J, Williams C, Williams LN, Keller PA, Baker TB. Preventing 3 million premature deaths and helping 5 million smokers quit: a national action plan for tobacco cessation. *Am J Public Health.* 2004; 94:205–10. [PubMed: 14759928]
10. Geller AC, Lash TL, Siegel B, Annas GD, Prout MN. The primary care pediatrician's influence on medical student's performance of smoking assessments and counseling. *Prev Med.* 2005; 41:47–52. [PubMed: 15916992]
11. Geller AC, Prout M, Sun T, Lew RA, Culbert AL, Koh HK. Medical students' knowledge, attitudes, skills, and practices of cancer prevention and detection. *Journal of Cancer Education.* 1999; 14(2):72–7. [PubMed: 10397480]
12. Geller AC, Prout MN, Miller DR, Sun T, Koh HK, Ockene J. Evaluation of a cancer prevention and control curriculum. *Preventive Medicine.* 2002; 35:78–86. [PubMed: 12079444]
13. Geller AC, Brooks DR, Powers CA, Brooks KR, Rigotti NA, Bogner B, McIntosh S, Zapka J. Tobacco cessation and prevention practices reported by second and fourth year students at US medical schools. *J Gen Intern Med.* 2008; 23:1071–6. [PubMed: 18612747]
14. Hamdy H, Prasad K, Anderson MB, Scherpbier A, Williams R, Zwierstra R, Cuddihy H. BEME systematic review: predictive values of measurements obtained in medical schools and future performance in medical practice. *Med Teach.* 2006; 28:103–16. [PubMed: 16707291]
15. Irby DM, Aagaard E, Teherani A. Teaching points identified by preceptors observing one-minute preceptor and traditional preceptor encounters. *Acad Med.* 2004; 79:50–55. [PubMed: 14690997]
16. Kies SM, Roth V, Rowland M. Association of third-year medical students' first clerkship with overall clerkship performance and examination scores. *JAMA.* 2010; 304:1220–6. [PubMed: 20841536]
17. Meredith LS, Yano EM, Hickey SC, Sherman SE. Primary care provider attitudes are associated with smoking cessation counseling and referral. *Med Care.* 2005; 43:929–34. [PubMed: 16116358]
18. Quinn VP, Stevens VJ, Hollis JF, Rigotti NA, Solberg LI, Gordon N, Ritzwoller D, Smith KS, Hu W, Zapka J. Tobacco-cessation services and patient satisfaction in nine nonprofit HMOs. *Am J Prev Med.* 2005; 29:77–84. [PubMed: 16005802]
19. Schultz KW, Kirby J, Delva D, Godwin M, Verma S, Birtwhistle R, Knapper C, Seguin R. Medical Students' and Residents' preferred site characteristics and preceptor behaviours for learning in the ambulatory setting: a cross-sectional survey. *BMC Med Educ.* 2004; 6:12. [PubMed: 15298710]
20. Sostock MA, Coberly L, Rouan G. Feedback process between faculty and students. *Acad Med.* 2002; 77:267. [PubMed: 11891169]
21. Teherani A, O'Brien BC, Masters DE, Poncelet AN, Robertson PA, Hauer KE. Burden, responsibility, and reward: preceptor experiences with the continuity of teaching in a longitudinal integrated clerkship. *Acad Med.* 2009; 84(10 Suppl):S50–3. [PubMed: 19907386]
22. Torre DM, Simpson D, Sebastian JL, Elnicki DM. Learning/feedback activities and high-quality teaching: perceptions of third-year medical students during an inpatient rotation. *Acad Med.* 2005; 80:950–4. [PubMed: 16186616]
23. Usatine RP, Nguyen K, Randall J, Irby DM. Four exemplary preceptors' strategies for efficient teaching in managed care settings. *Acad Med.* 1997; 72:766–769. [PubMed: 9311317]
24. Usatine RP, Tremoulet PT, Irby D. Time-efficient preceptors in ambulatory care settings. *Acad Med.* 2000; 75:639–42. [PubMed: 10875509]

Figure 1.
Graph of Family Medicine Preceptor Score and Internal Medicine Preceptor Score Versus Skill Score

Table 1

Student Demographics by Clerkship Type

	Clerkship Type											
	Family Medicine (N=153)			Internal Medicine (N=292)			Both (N=466)			Neither (N=237)		
	N	Col %		N	Col %		N	Col %		N	Col %	
School												
Creighton	2	1.3%		1	0.3%		50	10.7%		55	23.2%	
Georgetown	39	25.5%		47	16.1%		41	8.8%		43	18.1%	
Iowa	23	15.0%		27	9.2%		39	8.4%		11	4.6%	
Kentucky	30	19.6%		26	8.9%		1	0.2%		16	6.8%	
LSU	11	7.2%		29	9.9%		19	4.1%		14	5.9%	
Louisville	2	1.3%		8	2.7%		71	15.2%		63	26.6%	
Minnesota	18	11.8%		96	32.9%		54	11.6%		14	5.9%	
Stanford	10	6.5%		16	5.5%		11	2.4%		12	5.1%	
UAB	18	11.8%		41	14.0%		51	10.9%		9	3.8%	
UPENN	0	0.0%		1	0.3%		129	27.7%		0	0.0%	
Gender												
Male	81	53.6%		150	52.8%		220	49.2%		121	51.7%	
Female	70	46.4%		134	47.2%		227	50.8%		113	48.3%	
Age (mean, std. dev.)	25.7	2.1		25.9	2.6		26.0	2.4		26.3	3.6	
Self Reported Tobacco Dependence Counseling Skills:												
Asking about smoking at every visit												
not at all skilled	1	0.7%		4	1.4%		6	1.3%		4	1.7%	
somewhat skilled	43	28.1%		67	22.9%		92	19.8%		63	26.6%	
moderately skilled	61	39.9%		126	43.2%		213	45.9%		110	46.4%	
very skilled	48	31.4%		95	32.5%		153	33.0%		60	25.3%	
Advising smokers to quit												
not at all skilled	1	0.7%		18	6.2%		9	1.9%		14	5.9%	
somewhat skilled	61	39.9%		113	38.7%		139	29.9%		113	47.7%	
moderately skilled	78	51.0%		125	42.8%		235	50.5%		91	38.4%	
very skilled	13	8.5%		36	12.3%		82	17.6%		19	8.0%	
Assessing smokers' willingness to quit												

	Clerkship Type											
	Family Medicine (N=153)				Internal Medicine (N=292)				Both (N=466)			
	N	Col %	N	Col %	N	Col %	N	Col %	N	Col %	N	Col %
not at all skilled	3	2.0%	16	5.5%	12	2.6%	8	3.4%	39	3.4%	39	3.4%
somewhat skilled	51	33.3%	103	35.3%	152	32.8%	113	47.9%	419	36.6%	419	36.6%
moderately skilled	83	54.2%	144	49.3%	229	49.4%	102	43.2%	558	48.7%	558	48.7%
very skilled	16	10.5%	29	9.9%	71	15.3%	13	5.5%	129	11.3%	129	11.3%
Assisting smokers to develop a quit plan												
not at all skilled	23	15.0%	82	28.2%	74	15.9%	66	28.0%	245	21.4%	245	21.4%
somewhat skilled	74	48.4%	118	40.5%	213	45.8%	111	47.0%	516	45.1%	516	45.1%
moderately skilled	49	32.0%	77	26.5%	152	32.7%	51	21.6%	329	28.7%	329	28.7%
very skilled	7	4.6%	14	4.8%	26	5.6%	8	3.4%	55	4.8%	55	4.8%
Arranging follow-up contact regarding smoking cessation												
not at all skilled	28	18.3%	89	30.5%	95	20.4%	60	25.4%	272	23.7%	272	23.7%
somewhat skilled	80	52.3%	130	44.5%	200	43.0%	117	49.6%	527	46.0%	527	46.0%
moderately skilled	34	22.2%	63	21.6%	143	30.8%	50	21.2%	290	25.3%	290	25.3%
very skilled	11	7.2%	10	3.4%	27	5.8%	9	3.8%	57	5.0%	57	5.0%
Discussing pharmacotherapy options and use												
not at all skilled	21	13.7%	67	22.9%	53	11.4%	54	22.8%	195	17.0%	195	17.0%
somewhat skilled	83	54.2%	145	49.7%	194	41.7%	118	49.8%	540	47.1%	540	47.1%
moderately skilled	38	24.8%	68	23.3%	178	38.3%	58	24.5%	342	29.8%	342	29.8%
very skilled	11	7.2%	12	4.1%	40	8.6%	7	3.0%	70	6.1%	70	6.1%

* 65 students missing clerkship type are not included in the table

Table 2
Distribution of Clinical Preceptors by Family Medicine and Internal Medicine Clerkships

	N	Family Medicine				N	Internal Medicine			
		Strongly disagree %	Disagree %	Agree %	Strongly agree %		Strongly disagree %	Disagree %	Agree %	Strongly agree %
Clinical preceptors have provided me with clear instruction on ways to provide tobacco dependence counseling for my patients	618	3.7	34.0	50.5	11.8	746	10.5	50.9	36.1	2.5
Clinical preceptors have given me feedback on my tobacco dependence counseling of my patients	619	15.5	54.8	22.8	6.9	741	21.6	62.3	14.3	1.8
Clinical preceptors have modeled ways that tobacco dependence counseling should be provided	616	4.2	27.1	56.8	11.9	744	11.4	41.9	42.6	4.0
Clinical preceptors gave me clear objectives for tobacco dependence counseling, such as the number of smokers with whom I should interact	618	18.0	58.4	18.3	5.3	740	21.2	63.1	13.8	1.9
There is a place on my preceptors' records that remind staff to advise patients to quit smoking	618	11.8	48.2	31.4	8.6	743	16.3	55.5	24.6	3.6
Educational materials for patients about smoking cessation were predominantly displayed in my preceptors' offices	615	4.2	33.7	48.8	13.3	740	14.7	49.9	31.8	3.6
In my final review with my clinical preceptors, they responded to my questions about tobacco dependence counseling	610	9.8	42.8	41.1	6.2	730	15.5	54.9	26.8	2.7

The test of each preceptor question on rotation type showed that each preceptor question is significantly different by rotation type for every preceptor question ($p < 0.001$).

Table 3

Main Effects and Interaction of Preceptor Score for Family Medicine and Internal Medicine on Skill Score (N=1112)

Covariate	Main Effects			Model with Interaction		
	Coefficient (95% CI)	Std. Err.	P-value	Coefficient (95% CI)	Std. Err.	P-value
Preceptor Score for Family Medicine	0.32 (0.24 – 0.39)	0.037	<0.001	0.44 (0.34 – 0.54)	0.051	
Preceptor Score for Internal Medicine	0.274 (0.19 – 0.36)	0.042	<0.001	0.42 (0.30 – 0.54)	0.060	
Preceptor Score Family Medicine & Internal Medicine Interaction				-0.04 (-0.07 – -0.02)		
Age	-0.01 (-0.08 – 0.06)	0.034	0.786	-0.00 (-0.07 – 0.07)	0.034	0.993
Female	-0.57 (-0.94 – -0.20)	0.187	0.002	-0.54 (-0.90 – -0.17)	0.186	0.004