Tobacco Dependence Curricula in US Osteopathic Medical Schools: A Follow-up Study

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Financial Disclosures: Dr Montalto has received honoraria from Pfizer Inc for tobacco cessation programs but reports no conflict of interest for this research. All other authors have no relevant conflicts of interest or financial disclosures.

Support: Funding for this study was provided by the West Virginia School of Osteopathic Medicine.

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Submitted December 19, 2012; revision received June 19, 2013; accepted July 2, 2013.

Context: Tobacco use is the leading preventable cause of illness and death in the United States. A 1998 survey of US osteopathic medical schools identified deficiencies in tobacco dependence curricula.

Objective: To assess the current content and extent of tobacco dependence education and intervention skills in US osteopathic medical school curricula.

Design: An electronic survey.

Setting: Osteopathic medical schools with students enrolled for the 2009-2010 academic year.

Participants: Twenty-seven osteopathic medical school deans or their designated administrators.

Main Outcome Measures: Reported instruction in 7 basic science and 6 clinical science content areas (elective or required) and hours of tobacco dependence education were assessed and compared with the 1998 data.

Results: The mean (standard deviation) number of content areas reported as covered in 2010 was 10.6 (2.3) (6.1 [1.2] basic science areas, 4.6 [1.3] clinical science areas). Seventeen of 27 respondents (63%) reported that smokeless tobacco content was covered at their school, and 9 of 27 (33%) reported that the stages of change counseling technique was covered. Compared with 1998, a significant increase was noted in the percentage of schools covering tobacco dependence (92.6% in 2010 compared with 57.9% in 1998, $P=.0002$). Reported hours of tobacco dependence instruction were also significantly higher in 2010 compared with those in 1998 (Fisher exact test, $P<.05$). No statistically significant changes were found in the proportion of schools covering all 13 content areas (15.7% vs 22.2%), the proportion covering motivational interviewing in detail (26.3% vs 33.3%), or the proportion requiring curricula on smokeless tobacco (57.9% vs 59.3%).

Conclusion: Osteopathic medical school respondents reported more instruction on tobacco dependence in 2010 compared with those in 1998. However, some important basic science and clinical science content areas are not being adequately taught in US osteopathic medical schools.

J Am Osteopath Assoc. 2013;113(11):838-848
doi:10.7556/jaoa.2013.059

As the leading preventable cause of illness and death in the United States, tobacco use is a critical threat to public health.[1,2] An estimated 45 million US adults aged 18 or older (19.3%) smoke cigarettes.[3] The percentage of US adult smokers decreased from 20.9% in 2005 to 19.3% in 2010.[1] However, the percentage of US adult smokers is still above the US Department of Health and Human Service's Healthy People 2020 goal of 12% or less.[4]

According to the US Centers for Disease Control and Prevention, in 2007 more than 40% of US adult smokers reported attempting to quit at least once in the past year.[5] Only 4% to 7% of smokers who attempt to quit are able to successfully stop smoking.[6,7] In general, physicians do not adequately provide smoking cessation assistance.[8,9] In 2006, the Association of American Medical Colleges surveyed more than 3000 physicians and found that 84% of physicians inquired about a patient's smoking status and 86% of those physicians recommended that their patients stop smoking.[10] Of those physicians who tried to help their patients stop smoking, 31% recommended nicotine replacement therapy, 17% arranged a follow-up appointment, and 7% referred the patient to help lines for quitting.[10] The report concluded that improvements are needed regarding physicians' tobacco cessation knowledge and skills, including increasing physician assistance to patients who smoke and increasing physician awareness of tobacco and control interventions.[10]

Physicians have numerous resources to assist patients in tobacco cessation. These resources include the Prochaska and DiClemente "Stages of Change" model,[11] motivational interviewing, the Agency for Healthcare Research and Quality's "Five A's" (ie, Ask, Advise, Assess, Assist, Arrange),[12] the National Cancer Institute's manual *How to Help Your Patients Stop Smoking: A National Cancer Institute Manual for Physicians*,[13] and drug therapies, which have been effective at increasing long-term smoking abstinence rates.[14,15]

One study[16] found that students who underwent tobacco dependence training in their first year of medical school retained their training into their fourth year of medical school. These findings suggest long-term retention of tobacco dependence training and support implementation of such training early in medical school.

Research on allopathic and osteopathic predoctoral tobacco dependence curricula was published in 1999 and 2004, respectively.[17,18] This research established a baseline for curricula at allopathic and osteopathic medical schools in the United States. The research also identified multiple areas of tobacco dependence education that could be improved.[17,18] Since these publications, there has been more attention on improving tobacco dependence education for all health care providers. In 2004, The National Action Plan for Tobacco Cessation was implemented. In general, the National Action Plan was intended to ensure competency in evidence-based management of tobacco dependence. One key initiative of the National Action Plan was tobacco dependence training and education; the plan recommended a tobacco cessation graduation requirement for medical and other health care professional students.[19] In 2008, however, a study of fourth-year medical students in New York City found that 64% of all surveyed respondents rated their ability to assist patients in tobacco cessation as inadequate.[20] This research concluded that 4 years after the National Action Plan was implemented, medical school curricula were still not effectively teaching tobacco dependence management.

The overall goal of our study was to evaluate the current status of tobacco dependence education in osteopathic medical school curricula and to compare those findings with 1998 baseline data.[18]

Methods

Survey Design

A waiver for the research in the present study was obtained from the institutional review board of the West Virginia School of Osteopathic Medicine in Lewisburg. In 2010, we developed a survey on tobacco dependence in osteopathic medical school curricula that was similar to the survey on the same topic used by Montalto and colleagues[18] in 1998. Although the 1998 survey included a list of available teaching resources, that information was removed for the 2010 survey. In addition, a question pertaining to varenicline tartrate (Chantix), a treatment not available in 1998, was added to the 2010 survey. In total, the 2010 survey consisted of 26 multiple choice questions (*eAppendix*).

Survey Distribution and Collection

A list of deans for osteopathic medical schools that had students enrolled in the 2009-2010 academic year was obtained from the American Association of Colleges of Osteopathic Medicine (AACOM). The survey was sent on July 8, 2010, to the attention of each of these deans by means of e-mail, with instructions for completing the survey and a link to the online survey (Survey Monkey). Deans were also provided a PDF version of the survey to print out and complete by hand if they preferred. The president of AACOM, Stephen C. Shannon, DO, MPH, sent a follow-up e-mail to the deans on July 14, 2010, requesting their response to the survey. The executive assistant to the AACOM president sent 2 additional follow-up e-mails on August 12, 2010, and September 7, 2010, to deans who had not yet completed the survey.

Data Analysis

Survey responses were entered into a Statistical Analysis System software package (version 9.2; SAS Inc) and data were summarized using descriptive statistics. Using the 1998 findings[18] as a guide, the results were summarized according to 7 key basic science areas and 6 key clinical areas (*Table 1*).

For data analysis, a blank response to a question was coded as "0" or "not covered." For some findings, data from multiple categories were grouped together to provide comparative statistics to the 1998 data or when there were inadequate data points for each category. For example, for the number of tobacco dependence curricular hours per year, the categories "5 to 10 hours," "10 to 20 hours," "20 to 40 hours," and ">40 hours" were grouped and reported as "5 or more hours." The Mann-Whitney U test was used to evaluate the number of hours of tobacco dependence curriculum vs the type of medical school curriculum (eg, discipline based, system based). To compare data from 2010 with data from 1998, several statistical tests were used, including the standard normal (z) test of proportions, z test for log-odds ratios, Fisher exact test, and Pearson χ^2 test. Alpha was set at .05 for all statistical analyses.

Results

Response Rate

The survey was sent to the deans of 28 US osteopathic medical schools. After the survey was sent, AACOM verified that 2 of the schools had duplicate curricula. Therefore, we excluded 1 of those schools from the study, resulting in a total of 27 US osteopathic medical schools surveyed. All 27 schools responded for a 100% response rate. Eighteen respondents (67%) completed the survey online, whereas 9 respondents (33%) submitted paper surveys. At the time of the survey, 2 schools (Lincoln Memorial University-Debusk College of Osteopathic Medicine and Touro College of Osteopathic Medicine in New York City) had students enrolled in years 1 and 2 only, and 2 schools (Pacific Northwest University of Health Sciences, College of Osteopathic Medicine and Western University College of Osteopathic Medicine) had students enrolled in academic years 1 through 3 only. Therefore, curriculum information for academic years 1 and 2 was available for all 27 schools, curriculum information for academic year 3 was available for 25 schools,

Table 1.
Key Content Areas for Tobacco Dependence Curricula Covered by Osteopathic Medical Schools in 2010 (N=27)

Content Area[a]	Osteopathic Medical Schools, No. (%)
Basic Science	
Cancer risk from smoking	27 (100)
Health effects due to tobacco-related diseases	27 (100)
Health effects of second-hand smoke exposure	23 (85.2)
Constituents of cigarette smoke	22 (81.5)
Signs and symptoms of nicotine withdrawal	26 (96.3)
High-risk and difficult-to-treat groups	22 (81.5)
Smokeless tobacco	17 (63.0)
Clinical Science	
Behavioral tobacco-dependence treatment techniques such as the "Five A's" (Ask, Advise, Assess, Assist, Arrange)[12]	22 (81.5)
Clinical science of treating tobacco dependence	23 (85.2)
"Stages of Change" counseling techniques[11]	9 (33.3)
Motivational interviewing	23 (85.2)
Pharmacologic agents	23 (85.2)
Smoking cessation techniques	22 (81.5)

[a] Content areas have been edited for *JAOA* style.

and curriculum information for academic year 4 was available for 23 schools.

Results of the 2010 Survey

Curriculum Models and Governance

Twenty-six respondents (96.3%) indicated that their schools had required core courses in academic years 1 and 2 (ie, the basic science years). When asked to select their school's fundamental curriculum model for academic years 1 and 2, 12 respondents (44.4%) indicated that their school had a discipline-based program, 4 (51.9%) indicated an organ system–based program, 8 (29.6%) indicated a problem-based program, 6 (22.2%) indicated a case-based program (patient-presentation model), and 6 (22.2%) chose "other." Some respondents selected more than 1 curriculum model, and a few respondents indicated that their curriculum model did not easily fall into the aforementioned categories.

When asked how new interdisciplinary topic areas were introduced in years 1 and 2, 5 respondents (18.5%) indicated that such topic areas were initiated by the associate dean for curriculum or academic affairs or equivalent, 9 (33.3%) indicated they were initiated by a central medical school curriculum committee, 3 (11.1%) indicated they were initiated by the relevant department, and 3 (11.1%) indicated they were initiated by 1 person. The remaining 7 respondents (25.9%) indicated that interdisciplinary topic areas were initiated by "other"

methods, by some combination of the methods presented, or by "all of the above" methods. Similar results were obtained when asking about who initiated new topic areas in academic years 3 and 4 (ie, the clinical clerkship years): 7 (25.9%) indicated the associate dean for curriculum, medical education, academic affairs, or equivalent; 9 (33.3%) indicated a central medical school curriculum committee; 3 (11.1%) indicated the relevant department; 2 (7.4%) indicated "just one person"; and 6 (22.2%) indicated "other."

When asked about the current status of tobacco dependence education in their school's curriculum, 16 respondents (59.3%) indicated that tobacco dependence education and training was already a part of their curriculum, 6 (22.2%) did not provide an answer, and 5 (18.5%) indicated that they had discussed incorporating tobacco dependence into their curriculum. When asked if the school had at least 1 course, workshop, or seminar in year 1 or year 2 in which any material specifically relating to tobacco dependence was covered, 17 respondents (63.0%) indicated that material was covered in a required course. Eight respondents (29.6%) did not answer this item. One respondent (3.7%) indicated that tobacco dependence material was covered in both required and elective courses, and 1 respondent (3.7%) indicated that tobacco dependence content was not covered. When asked about tobacco dependence education in years 3 and 4, 15 of 23 respondents (65.2%) indicated that it was not covered, 1 respondent (4.3%) indicated that elective training was provided, 4 (17.4%) indicated that required clinical training was provided, and 1 (4.3%) indicated that both required and elective training was provided. Two respondents (8.7%) did not answer this question.

When asked if the school had at least 1 faculty member with expertise in tobacco dependence (eg, research, treatment, public policy), 14 respondents (51.9%) indicated "yes" and 13 (48.1%) indicated "no." However, 22 respondents (81.5%) provided contact information for a key faculty member who was responsible for coordinating their medical school's tobacco dependence curriculum.

Overall Findings Regarding Basic Science and Clinical Science Content Areas

The respondents were asked to identify which of the 13 key basic science and clinical science content areas were included in their tobacco dependence curriculum. Although this question had 4 answer options for each content area (ie, part of a required course, part of a required course on tobacco-related issues, part of an elective course on tobacco-related diseases, and not offered), data were collated into the categories of "covered" and "not covered" to compare our findings with the 1998 findings. All 27 respondents (100%) indicated that the following 2 content areas were included in their school's curriculum: cancer risk from smoking and health effects due to tobacco-related diseases (*Table 1*).

For 9 other content areas, 22 of 27 respondents (81.5%) indicated the key content areas on tobacco dependence were covered in either a required or an elective course (*Table 1*). According to respondents, all school's curricula included at least 5 of the key content areas, and 6 (22.2%) indicated that their curricula included all 13 key content areas. Fourteen respondents (51.9%) indicated that their schools' curricula covered all 7 key basic science content areas, and 7 (25.9%) indicated that their curricula incorporated all 6 clinical content areas. The mean (standard deviation [SD]) of basic science content areas and clinical science content areas taught was 6.1 (1.2) and 4.6 (1.3), respectively. The mean (SD) for both basic and clinical science content areas was 10.6 (2.3).

Behavioral Interventions

Sixteen respondents (59.3%) indicated the Prochaska and DiClemente "Stages of Change" model[11] was not covered in their curriculum, 5 (18.5%) indicated that it was covered briefly, 4 (14.8%) indicated that it was covered in detail, and 2 (7.4%) did not answer this item. Three respondents (11.1%) indicated that motivational

interviewing was not covered, 15 (55.6%) indicated that it was covered briefly, and 9 (33.3%) indicated that it was covered in detail.

Twenty-two of 27 respondents (81.5%) indicated that behavioral tobacco dependence management techniques, such as the National Cancer Institute manual, the "Five A's" from the Agency for Healthcare Research and Quality, and relapse prevention, were offered, with 8 (29.6%) offering education about these techniques as part of a required course on tobacco-related diseases, 13 (48.1%) offering it as part of a required course not on tobacco-related diseases, 1 (3.7%) offering it as part of an elective course on tobacco-related diseases, and 5 (18.5%) not offering it at all.

Medications for Tobacco Dependence

Respondents were asked to provide detail regarding the amount of training on use of specific tobacco dependence medications in their school's curricula. Overall, 26 of 27 (96.2%) of schools surveyed covered nicotine replacement therapy (eg, nicotine patch, nasal spray, gum, lozenge, inhaler) either briefly or in detail in their curriculum. Complete findings on tobacco dependence medication instruction are available in *Table 2*.

Hours of Instruction on Tobacco Dependence by Year

In total, 22 of 23 respondents (96%) at schools with students enrolled in all 4 academic years reported tobacco dependence within their osteopathic medical school curriculum (*Table 3*). Of all schools, regardless of enrollment, 25 (92.6%) reported tobacco dependence curricula.

Using the Mann-Whitney U test, we attempted to determine if an osteopathic medical school's type of curriculum had a statistically significant effect on the number of tobacco dependence basic and clinical science content areas covered by that school. Whether schools had discipline-based ($P=.254$), organ system–based ($P=.388$), problem-based ($P=.552$), or case-based ($P=.872$) curricula did not significantly affect the number of tobacco dependence content areas covered.

Student Knowledge About Tobacco Dependence Management

In terms of assessing student knowledge on tobacco dependence, 17 respondents (63.0%) indicated that their school evaluated a student's knowledge by 1-on-1 supervision, medical record review of clinical notes, small group discussions, videotape analysis of a patient encounter, written examination, or objective structured clinical examination. Eight respondents (29.6%) indicated that their institutions assessed student performance by more than 1 type of evaluation, whereas 9 respondents (33.3%) indicated that they used only 1 type of evaluation. Ten respondents (37.0%) indicated that their curriculum did not evaluate student performance of tobacco dependence management.

Selected Comparisons of 1998 Data With 2010 Data

Schools Covering Tobacco Dependence

The percentage of schools reporting that tobacco dependence management was taught in years 1 through 4 of medical school was significantly higher in 2010: In 1998, 11 of 19 respondents (57.9%) reported that their school covered tobacco dependence at some point during the curriculum, compared with 25 (92.6%) in 2010 (z, $P<.003$).

Key Content Areas

The mean (SD) number of key basic science content areas covered in 1998 and 2010 was similar, with 6.0 (1.6) in 1998 and 6.1 (1.2) in 2010 ($P=.382$). The mean (SD) number of clinical science areas reported as covered was also similar, with 4.2 (1.5) in 1998 and 4.6 (1.3) in 2010 ($P=.606$). When these 2 categories were combined, no statistical differences were found (10.2 [3.5] in 1998 and 10.6 [2.3] in 2010, $P=.679$). Compared with 1998 findings, in the 2010 findings regarding the number of schools with all 7 basic science content areas covered,

Table 2.
Coverage of Medications in Tobacco Dependence Curricula in Osteopathic Medicine Schools, 2010 (N=27)

Medication	Osteopathic Medical Schools, No. (%)[a]			
	Covered in Detail	Covered Briefly	Not Covered	No Response
Nicotine replacement therapy (nicotine patch, nasal spray, gum, lozenge, or inhaler)	11 (41)	15 (56)	0	1 (4)
Bupropion hydrochloride (Zyban or Wellbutrin)	13 (48)	11 (41)	0	3 (11)
Varenicline tartate (Chantix)	12 (44)	11 (41)	1 (4)	3 (11)
Nortriptyline hydrochloride	8 (30)	15 (56)	1 (4)	3 (11)
Clonidine hydrochloride (Catapres)	7 (26)	13 (48)	1 (4)	6 (22)

[a] Some percentages do not total 100 because of rounding.

all 7 clinical science content areas covered, and all 13 basic science and clinical science content areas covered, no statistically significant changes were found (*Table 4*). In addition, no statistically significant changes were found in the percentage of schools that covered motivational interviewing and smokeless tobacco education.

Hours of Tobacco Dependence Curriculum

No statistically significant difference was found in the number of tobacco dependence curriculum hours reported in 1998 compared with those reported in 2010 for academic year 1, 2, 3, or 4 (Fisher exact test; year 1, $P=.362$; year 2, $P=.328$; year 3, $P=.388$; year 4, $P=.239$). However, when data for years 1 through 4 were combined, we found a significant increase in the amount of tobacco dependence curricular hours in 2010 compared with those in 1998 (Fisher exact test, $P<.05$). Moreover, osteopathic medical schools in 2010 were 4.12 times more likely to have 3 or more hours of tobacco dependence instruction compared with those in 1998 (odds ratio, 4.12; $P<.001$).

Comment

Study Limitations

The current research study has several limitations. Some of the survey items were not answered, suggesting that respondents did not know the answers to all questions or did not understand all answer choices. For instance, respondents from osteopathic medical schools with integrated curricula may have had difficulty responding to questions that asked them to classify their school's type of curriculum. In addition, when items were not answered, they were coded as not having been taught, which may have impacted our findings regarding the degree of teaching of these topics.

Given the experience gained during clinical rotations in academic years 3 and 4, the degree of teaching regarding tobacco dependence during the clinical years may have been underestimated. As previously mentioned, approximately 20% of US adults smoke.[3] Prevalence is even higher among Medicaid patients—according to the Centers for Disease Control and Prevention, approximately one-third of Medicaid patients smoke.[21] On the basis of these statistics, physicians in primary care practice and hospital settings are likely to encounter pa-

Table 3.
Hours of Tobacco Dependence Instruction by Academic Year Reported by Osteopathic Medical Schools

Hours of Tobacco Dependence Instruction	Osteopathic Medical Schools, No. (%)[a]			
	Year 1 (n=27)	Year 2 (n=27)	Year 3 (n=25)[b]	Year 4 (n=23)[b,c]
None	7 (25.9)	4 (14.8)	8 (32.0)	9 (39.1)
≤1	1 (3.7)	1 (3.7)	1 (4.0)	2 (8.7)
>1-3	8 (29.6)	10 (37.0)	4 (16.0)	0
>3-5	4 (14.8)	5 (18.5)	3 (12.0)	2 (8.7)
>5	3 (11.1)	4 (14.8)	2 (8.0)	0
No response	4 (14.8)	3 (11.1)	7 (28.0)	11 (43.5)

[a] Some percentages do not total 100 because of rounding.
[b] Lincoln Memorial University-Debusk College of Osteopathic Medicine in Harrogate, Tennessee, and Touro College of Osteopathic Medicine in New York City (New York) had students enrolled in years 1 and 2 but not in years 3 or 4.
[c] Pacific Northwest University of Health Sciences, College of Osteopathic Medicine in Yakima, Washington, and Western University of Health Sciences College of Osteopathic Medicine of the Pacific in Pomona, California, had students enrolled in years 1 through 3 but not in year 4.

tients who smoke. Consequently, many osteopathic medical students may have assisted preceptors who were working with their patients to stop smoking, even if training on smoking cessation was not a formally stated objective for those clinical rotations.

Another limitation of our study is the potential lack of knowledge of specific details about curricular content of the school deans or their administrators who completed the survey. In our experience, deans have an excellent grasp of the "big picture" regarding their curricula, but they might not know the level of detail that was required by some of the survey questions (eg, teaching about specific behavioral therapies or what resources are used in the curricula). The extent to which the respondent completing the survey was informed about tobacco dependence curricula and the amount of time that he or she was willing and able to devote to searching for detailed answers are not known.

Our survey asked respondents what was taught rather than measured what students actually learned. The impact of tobacco dependence curricula on the osteopathic medical care that these students provided years later in their clinical practices was not evaluated. Although the relationship between medical school and patient outcomes has been documented,[22-24] we were unable to find articles specifically documenting the long-term impact of osteopathic medical school curricula on physician practices regarding tobacco cessation.

Recommendations

To achieve the US Department of Health and Human Service's Healthy People 2020 goal of reducing the national smoking prevalence to less than 12%,[4] effective tobacco dependence curricula in predoctoral medical education is needed.

According to our data, more than 48% of the respondents were unable to identify a person at their school with faculty expertise in tobacco dependence. This finding may indicate a lack of focus and emphasis on teaching evidence-based management skills for tobacco dependence. We believe every medical school should have a well-trained "faculty champion" who has input in curricular decisions and the student evaluation process, as well as who serves as a subject expert across the cur-

Table 4.
Comparison of 1998[a] and 2010 Results of Surveys of Osteopathic Medical School Administrators Regarding Curricula on Tobacco Dependence

Items	Osteopathic Medical Schools, No. (%)[b]	
	1998 (N=19)	2010 (N=27)
Covered All 7 Basic Science Content Areas	9 (69.2)	14 (51.9)
Covered All 13 Basic and Clinical Science Content Areas	3 (15.7)	6 (22.2)
Motivational Interviewing		
Covered in detail	5 (26.3)	9 (33.3)
Covered briefly	9 (47.4)	15 (55.6)
Not covered at all	5 (26.3)	3 (11.1)
Stages of Change		
Covered briefly or in detail	10 (52.6)	9 (33.3)
Not covered at all	9 (47.4)	18 (66.7)
Smokeless Tobacco		
Part of a required course	11 (57.9)	16 (59.3)
Offered as an elective	1 (5.2)	1 (3.7)
Not offered	6 (31.6)	10 (37.0)

[a] 1998 data from Montalto et al.[18]
[b] No changes were statistically significant.

riculum and provides consultant-level care for tobacco dependence.

We also suggest that a seamless, coordinated effort in tobacco dependence education at all levels (ie, predoctoral, graduate, and continuing medical education) be planned, designed, and implemented to produce clinicians who will display the skills necessary to effectively manage tobacco dependence. Tobacco dependence clinical intervention skills acquired in predoctoral medical education should be reinforced in graduate training programs and should be continually evaluated with performance-based examinations. In addition, an evaluation of residency programs—especially primary care residency programs—should be implemented to assess the current status of tobacco dependence training and to identify areas that might be improved. This approach would increase the number of physicians who could effectively assist patients with tobacco cessation and improve patient outcomes.

We suggest that the following national organizations work together to develop a strategy to improve tobacco dependence medical education: the American Osteopathic Association, the American Association of Colleges of Osteopathic Medicine, the National Board of Osteopathic Medical Examiners, the American Medical Association, the American Association of Medical Colleges, the National Board of Medical Examiners, the American Board of Medical Specialties, the National Institutes of Health, the National Institute on Drug Abuse, and the Centers for Disease Control and Prevention. Using a collaborative approach, these national organizations could also develop curricular outcomes and standardized evaluation tools to access tobacco dependence management skills.

Osteopathic medical schools should consider adopting the strategies promoted in the report *Preparing for Action: Implementing the Youth and Adult Tobacco-Use Cessation National Blueprints* that was issued in 2003.[25] The report recommends strategies to mobilize and coordinate efforts that support tobacco cessation and to ensure that tobacco users gain access to effective treatment.[26,27]

Finally, we recommend that a continuous quality improvement project be implemented to monitor the trends in predoctoral medical tobacco dependence education every 3 to 5 years. This project would allow for the assessment of progress toward compliance with published national recommendations and evidence-based guidelines.

Conclusion

From 1998 to 2010, modest improvements were made in the tobacco dependence curricula of US osteopathic medical schools. Our findings indicate that although more osteopathic medical schools are incorporating to-

bacco dependence into their curricula, they are still not meeting current national recommendations in a consistent manner. We recommend a more focused, nationally coordinated effort among osteopathic medical school curriculum decision makers to improve the tobacco dependence curricula.

Acknowledgments

We thank Helen H. Baker, PhD, MBA, professor of clinical sciences at the West Virginia School of Osteopathic Medicine, for her assistance with the writing of this article, and Stephen C. Shannon, DO, MPH, president of the American Colleges of Osteopathic Medicine, and his executive assistant Anna M. Naranjo, MA, for their assistance in survey administration. We also thank the deans at the colleges of osteopathic medicine for their support in this project.

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JAOA Implements DOIs

Articles published in *The Journal of the American Osteopathic Association* (*JAOA*) are now registered with the DOI (digital object identifier) system. Like URLs, DOIs can be used to quickly locate specific content online. However, unlike URLs, DOIs never change or break over time. Readers of the *JAOA* can find DOIs after the abstracts in research articles and after the final paragraphs in communications and special feature articles (eg, letters, clinical images).

eAppendix.
Electronic Survey: Tobacco Dependence Diagnosis and Treatment Curricula in the United States

1. Instructions for Completing This Survey

WELCOME! This survey should take you no more than 15 minutes to complete. Please answer all questions. All items marked with an asterisk (*) require an answer. Thank you.

To Forward to a Colleague: If you need to forward this survey to a colleague so that he or she can respond, please ensure that all questions have been completed before submitting the survey.

To Complete Your Survey: Simply click "submit results" on the last page of the survey. Thank you.

Contact Us: If you should have any questions prior to submitting the survey, please contact Brian N. Griffith, MA, PhD, at (304) 647-6225 or at bgriffith@osteo.wvsom.edu.

Problems: If you are having problems with the online survey and would rather not complete this survey online, please e-mail Brian N. Griffith, MA, PhD, at bgriffith@osteo.wvsom.edu and we will send you a PDF version of the survey, which can be filled out and mailed to:

Brian N. Griffith, MA, PhD
Assistant Professor of Biochemistry
West Virginia School of Osteopathic Medicine
400 N Lee St
Lewisburg, WV 24901-1128

2. Respondent Contact Information

***1.** Information about the individual completing this survey.

Name: _____

Highest Degree: _____

Title: _____

Medical School: _____

Address: _____

State: _____

Phone: _____

E-mail: _____

3. General Curricular Items

In the next 4 questions, please provide answers that apply to your entire medical school curriculum.

2. In the basic science years (years 1 and 2), do you have any core courses (including lectures and/or labs) that medical students are required to attend?

☐ Yes
☐ No

3. During the basic science years (years 1 and 2), please indicate your fundamental curriculum model and how many students are enrolled (if your school has more than 1 curriculum track, please indicate the number of students enrolled in each track):

	Number of Students in Each Program						
	0-10	11-25	26-50	51-100	101-150	151-200	>200
Discipline-based (pathology, biochemistry, etc)	☐	☐	☐	☐	☐	☐	☐
Organ system–based (eg, renal system)	☐	☐	☐	☐	☐	☐	☐
Problem-based (eg, small student groups)	☐	☐	☐	☐	☐	☐	☐
Case-based (patient case presentation)	☐	☐	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐	☐

Please specify: _____

4. At your medical school, which of the following entities most likely initiates the addition of new or novel INTERDISCIPLINARY topic areas in the core basic science curriculum (years 1 and 2) (eg, bioterrorism, complementary and alternative medicine, global health, cultural competence)?

- ☐ The associate dean for curriculum or academic affairs, or equivalent
- ☐ A central, medical school curriculum committee
- ☐ The relevant department (eg, department of pharmacology or physiology)
- ☐ Just 1 person (eg, the chair of the pathology department or a professor in a specific course)
- ☐ Other (please specify): _____

5. At your medical school, which of the following entities most likely initiates the addition of new or novel INTERDISCIPLINARY topic areas in the clinical clerkships (years 3 and 4) (eg, initial response to bioterrorism, rapidly emerging infections, providing medical services during a global disaster, cultural competency)? (Check only 1 response below.)

- ☐ The associate dean for curriculum, medical education, academic affairs, or equivalent
- ☐ A central, medical school curriculum committee
- ☐ The relevant department (eg, department of medicine or pediatrics)
- ☐ Just 1 person (eg, the chair of the surgery department or a professor in a specific clerkship)
- ☐ Other (please specify): _____

4. Tobacco Dependence Curricular Items

The remaining questions apply to the tobacco dependence curriculum in your medical school.

6. In your medical school curriculum, what is the current status for educating your medical students about treatment of tobacco dependence? (Select the 1 best response for your school.)

- ☐ We have not yet discussed inclusion of tobacco dependence education into our curriculum.
- ☐ We have discussed tobacco dependence education, but there is no room in the curriculum for this topic.
- ☐ We have discussed tobacco dependence education and would like to incorporate it in the curriculum, but we are unsure how to do so.
- ☐ We have discussed tobacco dependence education and are in the planning stages to add it within the next 3 academic years.
- ☐ We have discussed tobacco dependence education and are currently implementing changes.
- ☐ Tobacco dependence education and training are already a part of our curriculum.

7. During the basic science years (years 1 and 2), does your medical school have at least 1 course, workshop, or seminar, within which any material specifically relating to tobacco dependence is covered (eg, “core” courses or seminars in neurogenetics, neurophysiology, neuropharmacology, pathology, or clinical pharmacotherapeutics that contain material and information relevant to understanding the basic science of tobacco dependence)? (Select the 1 best response for your school.)

- ☐ No, neither required nor elective
- ☐ Yes, elective course only
- ☐ Yes, required course only
- ☐ Yes, both required and elective courses
- ☐ Other

5. Key Faculty for Tobacco Dependence Curriculum

8. During the clinical clerkship years (years 3 and 4), does your medical school include any training specifically covering any aspect of tobacco dependence treatment (eg, diagnosis of tobacco dependence severity, determining which pharmacotherapeutic agents to use)? (Select the 1 best response for your school.)

- ☐ No, neither required nor elective clinical training
- ☐ Yes, elective clinical training only
- ☐ Yes, required clinical training only
- ☐ Yes, both required and elective clinical training

9. Do you have at least 1 current faculty member with expertise in tobacco dependence (eg, research, treatment, public policy)?

☐ No
☐ Yes

10. Please indicate which department takes primary responsibility for teaching tobacco dependence (basic science and/or clinical science) to your medical students:

_____

11. Please provide contact information for your key faculty member who is responsible for coordinating your medical school's tobacco dependence curriculum (please include a phone number and an e-mail address):

Name: _____

Highest degree(s): _____

Title: _____

Department: _____

Address line 1: _____

State: _____

Phone: _____

E-mail _____

12. Please list and provide the contact information for up to 3 additional faculty members that assist in coordinating your medical school's tobacco dependence curriculum:

_____

_____

_____

6. Tobacco Curricular Items

13. Please indicate which years medical students take required courses or clerkships in which they would learn tobacco dependence diagnosis and treatment skills. Simply mark the corresponding number of hours this subject is taught:

	None	≤1 hour	>1 to 3 h	>3 to 5 h	>5 to 10 h	>10 to 20 h	>20 to 40 h	>40 h
1st year	☐	☐	☐	☐	☐	☐	☐	☐
2nd year	☐	☐	☐	☐	☐	☐	☐	☐
3rd year	☐	☐	☐	☐	☐	☐	☐	☐
4th year	☐	☐	☐	☐	☐	☐	☐	☐

14. We welcome specific comments about your teaching format and content:

_____

_____

_____

15. Please indicate which years medical students take electives in which they would learn tobacco dependence diagnosis and treatment skills. Simply mark the corresponding number of hours this subject is taught:

	None	≤1 hour	>1 to 3 h	>3 to 5 h	>5 to 10 h	>10 to 20 h	>20 to 40 h	>40 h
1st year	☐	☐	☐	☐	☐	☐	☐	☐
2nd year	☐	☐	☐	☐	☐	☐	☐	☐
3rd year	☐	☐	☐	☐	☐	☐	☐	☐
4th year	☐	☐	☐	☐	☐	☐	☐	☐

16. Please estimate the percentage of your medical students that take any of the electives referred to in question 15:

	None	0%-10%	11%-25%	26%-50%	51%-75%	76%-90%	91%-100%
1st year	☐	☐	☐	☐	☐	☐	☐
2nd year	☐	☐	☐	☐	☐	☐	☐
3rd year	☐	☐	☐	☐	☐	☐	☐
4th year	☐	☐	☐	☐	☐	☐	☐

17. Please indicate which of the following topics are included in your medical school's tobacco dependence curriculum. Since some topics may be taught in several classes, more than 1 response may be checked in each row. Check all responses that apply for each row:

	Parts of a Required Core Course (but not on Tobacco-Related Diseases)	Required Course on Tobacco-Related Diseases	Elective Course on Tobacco-Related Diseases	Not Offered
Cancer risk from smoking	☐	☐	☐	☐
Cardiovascular disease risk or chronic obstructive pulmonary disease (risk from cigarette smoking)	☐	☐	☐	☐
Health effects due to tobacco-related diseases	☐	☐	☐	☐
Health effects of secondhand smoke exposure	☐	☐	☐	☐
Constituents of cigarette smoke (nicotine, tar, carbon monoxide, etc)	☐	☐	☐	☐
Signs and symptoms of nicotine withdrawal	☐	☐	☐	☐
Beneficial and adverse effects of nicotine in tobacco smoke and on the central nervous system	☐	☐	☐	☐
Basic science of tobacco dependence (neurogenetics, neuropathology, and pharmacology)	☐	☐	☐	☐
Clinical science of treating tobacco dependence, including didactic and clinical skills training	☐	☐	☐	☐
High-risk groups—those with most difficulty quitting, increase risk to relapse, or requiring a more intensive treatment plan (eg, females, adolescents, pregnant women, drug/EtOH dependence, psychiatric disorder)	☐	☐	☐	☐
Behavioral tobacco dependence treatment techniques, such as the National Cancer Institute or Agency for Healthcare Research and Quality's "Five As'" (Ask, Advise, Assess, Assist, Arrange), relapse prevention, or reducing automatic smoking	☐	☐	☐	☐
Pharmacologic tobacco dependence agents: any medication approved by the US Food and Drug Administration for treating tobacco dependence (eg, nicotine medications, bupropion, varenicline)	☐	☐	☐	☐

18. Please indicate which of the following topics are included in your school's smoking cessation curriculum a part of a required course, a required course dedicated to tobacco related diseases, or as an elective. Please mark "not offered" for any topic that does not apply to your curriculum. Some topics may be taught in several classes. Check all that apply:

	Part of Required Related Course	Required Course on Tobacco Diseases	Elective	Not Offered
Do you provide any curricula regarding the use of smokeless tobacco?	☐	☐	☐	☐
Do you offer a clinical rotation in addiction medicine that includes tobacco?	☐	☐	☐	☐

19. Do you discuss stages of change theory by Prochaska and DiClemente?

- ☐ Not covered
- ☐ Covered briefly
- ☐ Covered in detail

20. How much discussion of motivational interviewing is included in your curriculum?

- ☐ Not covered
- ☐ Covered briefly
- ☐ Covered in detail

21. How much training in the use of specific tobacco dependence medications is included in your curriculum?

	Not Covered	Covered Briefly	Covered in Detail
Nicotine medications (eg, nicotine patch, nasal spray, gum, lozenge, inhaler)	☐	☐	☐
Bupropion (Zyban or Wellbutrin SR)	☐	☐	☐
Varenicline (Chantix)	☐	☐	☐
Nortriptyline	☐	☐	☐
Clonidine (Catapres)	☐	☐	☐

Other (please specify):

_____

7. Tobacco Dependence Clinical Skills

22. Does your curriculum provide a clinical setting where students counsel and treat tobacco-dependent patients? (Select all that apply.)

- ☐ No
- ☐ Provided, but not required
- ☐ Required in artificial or clinical-simulation setting (eg, role play or nonclinical setting without actual patients)
- ☐ Required in clinical setting with actual patients
- ☐ Required in clinical setting with actual patients and students are evaluated or tested on performance in the practice setting
- ☐ Required evaluation using an objective structure clinical evaluation (OSCE) (eg, role play with actors trained as tobacco-dependent patients or computer simulation)
- ☐ Other (please specify):

_____

23. Do your medical students have access to an affiliated tobacco dependence treatment clinic or program where they can observe, learn, and be trained in tobacco cessation clinical skills?

- ☐ Yes, as an elective
- ☐ Yes, required
- ☐ No

24. If your medical students receive clinical training in tobacco dependence management, how do you evaluate their performance? (Check all that apply.)

- ☐ We do not evaluate performance
- ☐ One-on-one supervision/discussion with faculty
- ☐ Chart review of clinical notes
- ☐ Small-group discussion(s)
- ☐ Videotape, close-circuit television, or similar techniques of medical student-patient encounter
- ☐ Written tests or quizzes
- ☐ Objective Structured Clinical Examination (OSCE)
- ☐ Other (please specify):

_____

8. Notification of Findings From This Study

25. Please check the appropriate boxes:

- ☐ No
- ☐ Yes
- ☐ We would like a copy of the findings
- ☐ We would like to be notified at the time of publication

26. We would also value any comments or suggestions you would like to share with us. Please list your comments or e-mail them directly to bgriffith@osteo.wvsom.edu.

_____

_____

_____

_____

_____