Tobacco Dependence Curricula in Undergraduate Osteopathic Medical Education

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Context: Tobacco use has been identified as the primary preventable cause of premature deaths and disability, yet results of a previous survey show that undergraduate allopathic medical schools do not adequately address this topic. Objective: To assess the content and extent of tobacco education and intervention skills in osteopathic medical schools’ curricula. Design: A mailed survey with 19 questions similar to one used for allopathic medical schools. Setting: Nineteen osteopathic medical schools. Participants: Responses were obtained from each associate dean for medical education or representative. Main Outcome Measures: Curricula in seven basic science and six clinical science content areas (elective or required), hours of tobacco use intervention education, and resource materials used to design curricula. Results: Average number of total content areas covered was 10.2 (6 ± 1.6 basic science areas, 4.17 ± 1.54 clinical areas) with a range of 2 to 13. Nine (47%) schools reported covering all seven basic science areas, and one school reported covering none. Eleven (64.7%) of seventeen schools reported less than 3 hours of training in tobacco dependence treatment techniques during all 4 years. Sixty percent of schools do not require clinical training in smoking cessation techniques. Thirty-six percent require clinical training in an artificial setting without patients. None of the schools require clinical training with live patients. The schools founded after 1920 covered an average of almost twice as many content areas as those founded before 1920 (11.1 vs 6.6; P = .018). Conclusions: Most US osteopathic medical school graduates are not being adequately educated to treat nicotine dependence as recommended by the National Cancer Institute expert panel and the Public Health Service Clinical Practice Guideline. Specifically, osteopathic medical education is deficient in clinical nicotine dependence treatment during the third and fourth years.

The effects of tobacco use have been identified as the number one cause of premature deaths (more than 430,000 per year) and disability in the United States. Tobacco use is a major contributing risk factor for the top four causes of death: heart disease, cancer, cerebrovascular diseases, and chronic obstructive pulmonary disease (chronic bronchitis and emphysema). Approximately one fifth of all deaths in the United States are attributed to tobacco use. Currently, 22.5% of the US adult population uses tobacco.

Mark Manley of the National Cancer Institute (NCI) and one of the authors of How to Help Your Patients Stop Smoking states, “Most physicians, like myself, manage to get through medical school without any formal training in tobacco cessation.” Cummings et al suggest that medical school is the optimal time for skills training in tobacco cessation. Only 21% of physicians who were surveyed believed their medical education adequately prepared them to help patients stop smoking. This lack of training occurs during undergraduate and graduate medical education and results in a significant void in physician skills to adequately intervene with tobacco dependence.

In 1992, an NCI expert panel suggested that undergraduate medical education for tobacco use prevention and cessation be mandatory and implemented by 1995 in all US medical schools. However, results of a 1997 survey by Ferry et al showed that 69.2% of accredited allopathic medical schools were not providing adequate training in the treatment of tobacco dependence, mostly because of a lack of clinical instruction and evaluation in the third and fourth years.

Many physicians do not comply with recommended guidelines for cessation intervention. Didactic continuing medical education programs have been ineffective at changing the clinical performance of physicians. The smoking cessation clinical practice guideline was first published in 1996 and revised in 2000. Although 70% of smokers visit their physicians yearly, national data regarding physician behavior indicate that physicians advised only 25% to 45% of smokers to quit and assisted only 15% in quitting. Evidence-based recommendations suggest that five first-line pharmaceutical products, both prescription and nonprescription, be offered to all tobacco users for the treatment of nicotine dependence.

Since 1995, the Food and Drug Administration has
approved several pharmaceutical products for the treatment of nicotine dependence, yet only 5% of smokers use these aids during attempts to quit (J. A. Johnston, PharmD, oral communication, April 2002). No evidence is available to show that the dissemination of the Public Health Service’s Smoking Cessation Clinical Practice Guideline Number 18\(^{15}\) has resulted in changes in physician counseling or prescribing behavior (M. C. Fiore, MD, MPH, oral communication, February 2002). In 1999, the Agency for Health Care Quality and Research\(^{22}\) reported that only 51% of physicians had reviewed the guidelines published in 1996. Of those physicians, only 9% had fully and 39% had partially implemented the guidelines.

Approximately 80% of smokers express a desire to quit,\(^{23}\) and nearly half (46%) try to quit each year.\(^{24}\) However, the prevalence of smokers has not dramatically reduced since 1993. The prevalence of smoking was 25.0% in 1993, 24.7% in 1997, and 23.5% in 1999,\(^{4}\) an average reduction of only 0.25% per year. The Centers for Disease Control and Prevention has postulated that this reduction may be due to the increased taxes and wholesale prices that began in 1997 rather than a change in medical treatment of tobacco users.\(^{4}\)

This article reports on a survey of tobacco dependence curricula at 19 osteopathic medical schools. Both basic science and clinical curricula are evaluated for extent of knowledge, clinical intervention skills, and the type of clinical training based on the Smoking Cessation, Clinical Practice Guideline Number 18\(^{15}\) and recommendations from the NCI expert panel.\(^{8,16}\)

Methods

Survey Design

This survey modifies the one used by Ferry et al\(^{9}\) to evaluate allopathic medical school curricula by including additional questions on smokeless tobacco education, use of motivational interviewing techniques, types of training available, didactic and clinical skills in tobacco addiction treatment, and methods of evaluation in their curriculum. Questions were designed to assess basic science and clinical science content based on the Smoking Cessation Clinical Practice Guideline Number 18\(^{15}\) and the NCI Expert Panel suggestions.\(^{8}\)

Tobacco curricula were defined as the epidemiology and prevention of tobacco use, risk of tobacco-related diseases, and treatment. Smoking cessation included information on behavior-modification techniques, stages of change assessments, motivational interviewing techniques, pharmacotherapy, and counseling skills.

Survey Content

This two-page survey consisted of 17 multiple-response questions and two open-ended questions. The first two sections of questions were designed to evaluate seven basic science areas and six clinical science areas (Figure 1). The survey then asked whether these 13 topics were covered as part of a required course, as an elective course, or not offered. Last, a new item inquired whether any clinical rotations in addiction medicine included tobacco intervention training.

In a third section, information about clinical teaching methods and assessments of student performance were gathered. The following options for each topic were listed: (1) not required, or (2) required in an artificial setting without patients, a clinical setting with patients, or a clinical setting with patients that included an evaluation of the student’s performance. The methodology of student performance evaluation was also indicated (ie, clinical encounter with patients, use of standardized patients, videotape review, clinical observation).

The survey’s fourth section assessed the number of hours of instruction devoted to tobacco dependence in each year of medical school. Response options included less than 1 hour, 1 to 3 hours, 3 to 5 hours, or more than 5 hours. Last, each school

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**Basic Sciences***
- Cancer risk from tobacco
- Health effects: tobacco-related diseases
- Effects of passive smoking
- Cigarette smoke contents (nicotine, tar, carbon monoxide)
- Nicotine withdrawal symptoms
- High-risk groups with most difficulty quitting (teens, pregnancy, psychiatric disorders)
- Smokeless tobacco curricula†

**Clinical Sciences***
- Clinical intervention (5 A’s: Anticipate, Ask, Advise, Assist, Arrange)
- Relapse prevention
- Stage of change counseling techniques†
- Motivational interviewing counseling techniques†
- Pharmacologic agents: nicotine replacement or antidepressant therapy
- Smoking cessation techniques (artificial setting, clinical setting with patients, clinical setting with patients and evaluation of performance)

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* Wording of the survey as selected from the Agency for Health Care Policy and Research and National Cancer Institute Panel Recommendations.
† Items included for osteopathic survey, not included in Ferry et al.\(^ {9}\)

**Figure 1. Content areas for tobacco curriculum.**

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was asked to list all resource materials that it used for training in tobacco dependence and for developing its curriculum. Options for this response are listed in Table 1.

**Survey Collection**

The survey was sent to the attention of the associate dean for medical education at the 19 osteopathic medical schools. Non-respondents were sent a second survey and contacted by phone to encourage them to complete the survey if it was not returned within 3 weeks. The 19 osteopathic medical schools responded by March 2000.

**Data Analysis**

The responses on the survey items received from each osteopathic medical school were entered into the SPSS statistical package and summarized by descriptive statistics. A t-test or Mann-Whitney test was used to compare scores for different schools. If “none” or “zero” was marked, or if no answer was given, a value of “zero” was assigned.

**Results**

**Response Rates**

Repeated mailings sent initially in March 1998 and multiple phone calls resulted in an initial return rate of 89.5%. The final two schools’ responses were collected in the 1999–2000 academic year.

**Basic Science and Clinical Science Content Areas**

The curricula of the 19 surveyed osteopathic medical schools included at least two of the 13 content areas, and three schools (15.8%) included all 13 of the content areas (range, 2 to 13). Figure 2 shows the number of content areas for basic and clinical sciences covered by the schools. Nine schools (47.4%) reported covering all seven basic science content areas. One of the schools reported not covering any of the six content areas in the clinical sciences. The average number of content areas for all 19 schools was 10.2 ± 3.50 of the 13 content areas (range, 2 to 13), 6.00 ± 1.60 of the seven basic science content areas (range, 2 to 7), and 4.17 ± 1.54 of the six clinical science content areas (range, 2 to 6). However, schools founded after 1920 cover almost twice as many content areas as those schools founded before 1920 (mean, 11.1 ± 3.85; n = 5 versus mean, 6.6 ± 1.70; n = 12; Mann-Whitney, 9.50, P = .018).

Nearly half of the schools (47.4%) do not provide training in the transtheoretical “stages of change” model. Motivational interviewing is not covered by one fourth of the schools (26.3%). Of the seven schools that reported covering the first four clinical content areas (5 A’s: anticipate, ask, advise, assist, arrange; relapse prevention; stage of change counseling techniques; motivational interviewing counseling techniques), less than half (42.9%) reported covering the topics in detail. Two schools (10.5%) reported not covering any of the first four clinical content areas. Seven schools (36.8%) offered no “clinical smoking cessation techniques” as part of their curricula; however, four of these schools (57.1%) reported covering clinical tobacco intervention techniques in some course during all 4 years. None of the schools reported covering pharmacologic agents for nicotine replacement or antidepressant therapy in detail. Eighteen of the schools (94.7%) reported covering them briefly, and one school (5.26%) did not cover them at all.

**Hours of Instruction on Smoking Cessation**

Table 2 shows the number of hours of tobacco dependence instruction per year. Twenty-one percent of the schools average less than 3 hours of tobacco curricula during the 4 years of
undergraduate training—most of which were during the basic science years. Two of the schools did not have students in the third- or fourth-year curricula at the time the survey was complete, making the total responses for the clinical years’ analysis only 17 schools. Eleven of the 17 schools (64.7%) with third- and fourth-year curricula reported no tobacco dependence instruction during the third year. All 17 schools reported less than 1 hour of tobacco cessation dependence instruction during the fourth year. Two schools (10.5%) require a separate course on tobacco-related disease. Seven schools (36.8%) offer an elective in addiction medicine that includes tobacco cessation as a component of that rotation.

Clinical Assessment
Respondents were asked to indicate the type of clinical setting used to instruct students in clinical smoking cessation techniques. Nearly 60% of schools do not require students to have any clinical training for smoking cessation techniques. Seven of the schools (36.8%) reported requiring clinical training in an artificial setting without patients. None of the schools requires clinical training with actual patients.

Curriculum Resource Materials
Table 1 shows the resources used for development of tobacco dependence curriculum in the osteopathic medical schools. The three most commonly cited resources for curriculum development were unspecified scientific literature, Guide to Clinical Preventive Services, and material from volunteer agencies (American Cancer Association, American Cancer Society, American Heart Association).

Comment
Results of this osteopathic medical curricula survey are similar to results of the allopathic survey by Ferry et al. A comparison of the 12 common content areas and number of hours of training in both the osteopathic and allopathic surveys reveals no significant differences in either content or hours of training. Thus, as is the case with allopathic medical school graduates, most osteopathic medical school graduates are not adequately trained to treat patients with tobacco dependence.

Of note is the significant lack of training during the osteopathic medical students’ clinical experience in the third and (especially) fourth years. Twelve schools (70.5%) reported no instruction in the fourth year, and eleven schools (64.7%) had 3 or fewer hours in the entire 4-year curriculum.

One of the purposes for the revised Treating Tobacco Use and Dependence Clinical Practice Guideline is to compile and distribute evidence-based materials for the development of tobacco dependence curricula in medical schools (M. C. Fiore, MD, MPH, oral communication, February 2002). However, 2 years after the publication of the first version of the Clinical Practice Guideline, only one in five osteopathic medical

![Figure 2. Total number of content areas covered, total of seven basic sciences content areas and six clinical content areas. *The number of schools is 19 for the basic science content areas and 17 for the clinical science content areas because Pikeville College School of Osteopathic Medicine and Touro University College of Osteopathic Medicine did not have third- or fourth-year classes when the survey was returned.](http://jaoa.org/pdfaccess.ashx?url=/data/journals/jaoa/932032/)
seamless coordinated effort in tobacco dependence education at all levels (undergraduate, graduate, continuing medical education) be designed and implemented to produce clinicians who will possess the skills needed to effectively treat tobacco dependence.

Organizations such as 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, and the Centers for Disease Control and Prevention could unite to address this deficiency in education in tobacco dependence treatment for health professionals at the undergraduate and graduate level by developing core curriculum and standardized evaluation tools for tobacco dependence treatment skills. The inclusion of test questions reflecting a model core tobacco dependence curriculum on national licensing examinations would emphasize the importance of this topic to students and residents and would encourage faculty to develop the expertise to role model and teach this topic area more effectively.

Although the amount of evidence-based information and materials from which to build effective curricula is increasing, few medical schools appear to have incorporated these resources into their clinical curricula in such a manner that would develop the clinical competence necessary for their graduates to treat nicotine dependence. After curricula are implemented, an evaluation of knowledge, skills, and competency components need to be developed to ensure that medical students—and all health care professionals—have acquired adequate tools to be effective in their efforts to reduce tobacco dependence in their patients.

A systematic evaluation and dissemination of the most effective teaching tools and methods to create a “best practices” standard would answer one of the identified deficits in the schools (21.1%) cited using the material as a resource for their curricula.

Tobacco dependence is not receiving adequate attention in either US osteopathic or allopathic medical school curricula and does not meet current national recommendations in a consistent manner. Based on this survey, we conclude that medical school faculty have not identified, prioritized, or implemented effective training at the undergraduate level as called for more than a decade ago by the NCI expert panel, which met in 1992. This deficit may be the result of lack of expertise and training among faculty, insufficient existing curriculum materials, and/or absence of leadership and focus among academicians to design curricula that address the necessary skills to treat the most important public health issue in the United States. A lack of interest due to inadequate reimbursement for physicians’ direct involvement in the treatment of nicotine dependence may also be a factor. Our findings support the need for a nationally coordinated effort to stimulate faculty and medical students to develop the skills to reduce morbidity and mortality from tobacco-induced diseases.

**Limitations**

This study may be limited by the respondents’ lack of knowledge of the curriculum contents or hours of instruction. Terms like *motivational interviewing* and *stage of change* may not be well known to medical school administrators. No attempt was made to verify the responses after the initial mailed survey was received. Additionally, the survey period may not reflect the curricula being provided at the time this article is published, but does provide a baseline for future evaluation.

**Recommendations**

To achieve the Healthy People 2010 goal to reduce the national smoking prevalence to 12%, an effective tobacco dependence curricula must be incorporated into the preclinical and clinical years of undergraduate medical education. We suggest a seamless coordinated effort in tobacco dependence education at all levels (undergraduate, graduate, continuing medical education) be designed and implemented to produce clinicians who will possess the skills needed to effectively treat tobacco dependence.

Organizations such as 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, and the Centers for Disease Control and Prevention could unite to address this deficiency in education in tobacco dependence treatment for health professionals at the undergraduate and graduate level by developing core curriculum and standardized evaluation tools for tobacco dependence treatment skills. The inclusion of test questions reflecting a model core tobacco dependence curriculum on national licensing examinations would emphasize the importance of this topic to students and residents and would encourage faculty to develop the expertise to role model and teach this topic area more effectively.

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* Total number of schools in the third- and fourth-year analysis is 17, because Pikeville College School of Osteopathic Medicine and Touro University College of Osteopathic Medicine did not have third- or fourth-year classes when the survey was returned.
educational programs. The current use of clinical mentoring, simulated patient encounters, objective structured clinical examinations, interactive Web-based instruction, problem solving, and case-based learning should be evaluated for impact on health care provider behaviors. Tobacco dependence clinical intervention skills learned in undergraduate education should be reinforced in graduate training programs and evaluated in all examinations required for specialty certification. A similar survey of primary care residency programs should be conducted to evaluate the tobacco treatment training that future physicians are receiving. This comprehensive approach would increase the number of physicians who are adequately prepared to deal effectively with this most lethal public health problem.

New faculty development initiatives are needed to effectively prepare mentors with the background knowledge and experience to promote training interactions and to role model effective clinical interventions with tobacco users. Interactive continuing medical education courses are needed to improve treatment skills for practicing clinicians who desire more expertise in tobacco dependence treatment.

Medical educators must accept responsibility for the prevention and treatment of tobacco-related diseases. Adequate evidence-based published guidelines are available to improve tobacco dependence treatment delivery, and recent review articles have urged physician involvement. Educators and physicians must understand the priorities of clinical preventive services. Health care insurers must reimburse for tobacco treatment services. Tobacco cessation services must be provided for uninsured and low-income populations, as well.

In an era in which time and cost-benefit ratios are a vital component of physician behavior, assessing adults for tobacco use and providing tobacco cessation counseling rank second only to childhood immunizations in clinically preventable burden and cost-effectiveness. [Clinically preventable burden (CPB) refers to the proportion of disease and injury prevented by the clinical preventable service in usual practice if the service were delivered to 100% of the target population at recommended intervals. Clinically preventable burden is the product of the burden of disease targeted by the service and the effectiveness of the service measured as a percentage of burden reduced.] Based on surveys of osteopathic and allopathic tobacco dependence curricula, this priority has not been understood, appreciated, or implemented.

Finally, we recommend monitoring the trends in undergraduate tobacco dependence education every 3 to 5 years in osteopathic and allopathic medical schools to assess the progress toward compliance with published national recommendations based on evidence-based guidelines.

In an article titled “Tackling Tobacco in the 21st Century,”29 several key points were made. Lim recognizes that, “Physicians in training bear special responsibility to fight tobacco use within their generation.” He suggests, “One strategy deserving greater attention from medical educators is tobacco cessation.” We could not agree more. Our study suggests that undergraduate osteopathic and allopathic medical education have a long way to go in teaching tobacco dependence intervention. To address the nation’s greatest public health threat, all levels of physician training must focus on combining competent faculty with effective teaching techniques and effective curriculum materials.

References


