

# Tobacco Control Competencies for US Medical Students

The 2004 National Action Plan for Tobacco Cessation recommended that the US Department of Health and Human Services convene a diverse group of experts to ensure that competency in tobacco dependence interventions be a core graduation requirement for all new physicians and other key health care professionals. Core competencies would guide the design of new modules and explicitly outline the learning objectives for all graduating medical students.

In 2002, the National Cancer Institute funded a consortium to develop, test, and integrate tobacco curricula at 12 US medical schools. Because there was neither an explicit set of tobacco competencies for medical schools nor a process to develop them, one of the consortium's tasks was to articulate competencies and learning objectives. (*Am J Public Health*. 2005;95:950–955. doi:10.2105/AJPH.2004.057331)

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## CIGARETTE SMOKING REMAINS

the leading cause of preventable morbidity and mortality in the United States. Despite this, 23% of Americans, or 48 million, continue to smoke.<sup>1,2</sup> A large body of evidence supports the effectiveness of physician interventions, and the Public Health Service guidelines recommend that all clinicians counsel their patients to quit smoking.<sup>3</sup> Research has shown, however, that physicians do not routinely and effectively counsel their patients to quit smoking.<sup>4,5</sup>

Most recently, the Subcommittee on Cessation of the Interagency Committee on Smoking and Health published a national action plan for tobacco cessation that included a recommendation for investing in “training and education by FY 2005 to ensure that all clinicians in the United States have the knowledge, skills and support systems necessary to help their patients quit tobacco use.”<sup>6(p208)</sup> They specifically recommended that the US Department of Health and Human Services “convene a diverse group of experts to ensure that competency in tobacco dependence interventions is a core graduation requirement for all new physicians and other key health care professionals.”<sup>6(p208)</sup>

Earlier, in 1992, a National Cancer Institute expert panel on cigarette smoking and undergraduate medical education wrote that “a specific curriculum devoted to smoking cessation and prevention must become a mandatory component of under-

graduate medical education in every US school.”<sup>4(p626)</sup> However, studies and reviews conducted in the late 1990s documented suboptimal tobacco intervention training in medical schools.<sup>7–8</sup> In 2002, the National Cancer Institute funded a consortium of 12 US medical schools to develop, test, and integrate tobacco intervention curricula throughout the 4 years of medical school. Previous work has identified the need for a systematic process of testing before the development of new curricula.<sup>9</sup> After the tobacco curriculum modules within the 12 participating medical schools are tested, dissemination of the tested curriculum to all medical schools in the United States is anticipated.

Because there was neither an explicit set of tobacco control competencies for medical schools nor a process to develop them, one of the first tasks was to articulate competencies and learning objectives. Core competencies would guide the design of new modules and explicitly outline the learning objectives (knowledge, attitudes, skills, and behaviors) that all medical students should have met on graduation.

Competency-driven education is becoming the standard for medical education in the United States. In undergraduate medical education, a number of groups have stated the importance of using competencies to develop curricula and have thus created competencies in their fields. The Association of Teachers of Preventive Medicine developed core competencies that cover clinical

prevention, quantitative skills, health services organization and delivery, and community dimensions of medical practice.<sup>10</sup> The Accreditation Council for Graduate Medical Education also noted the importance of identifying competencies in order to develop medical school curricula and has developed general competencies for graduate medical students (or residents).<sup>11</sup>

We report on the delineation of core competencies and learning objectives for tobacco education in medical schools. Formative research and outcome analysis is planned to test attainment of these competencies as specific tobacco curriculum modules are implemented at participating medical schools. Future studies must go beyond the development of competencies to develop a national strategic plan for the integration of these competencies into medical school curricula.

## METHODS

### Participants

Twelve medical schools from throughout the United States, with a wide range of depth and breadth of tobacco control curricula, formed a consortium as part of the Tobacco Prevention and Cessation Education Project. The aim is to develop, refine, and integrate new modules; train medical school faculty; evaluate teaching content; assess opportunities for diffusion; and disseminate resource guides and tool kits to multiple universities. It is anticipated that universities with

exemplary tobacco control teaching can be found to serve as regional and national role models. The 12 medical schools are at the following universities: Boston University, Case Western Reserve University, Dartmouth College, Harvard University, Loma Linda University, University of Alabama at Birmingham, University of California at Los Angeles, University of Iowa, University of Kentucky, University of Massachusetts, University of Rochester, and University of South Florida.

### Development of Competencies

Tobacco control competencies were derived from a 5-step process that included (1) an assessment of the current status of tobacco control teaching at the 12 participating universities, (2) establishment of criteria to guide the development of tobacco control competencies, (3) review of tobacco control practice recommendations and those of leading practice organizations, (4) review of the development of competencies for similar health promotion efforts in medical schools, and (5) drafting of and consensus by the 12 schools on the competencies needed to guide tobacco modules.

### Assessment of the Current Status of Tobacco Teaching at the 12 Universities

In spring 2003, all 12 universities completed a standardized assessment of their medical school course offerings for tobacco education, including either stand-alone courses or modules integrated into a specific course.<sup>12</sup> The survey instrument, an instruction manual, a glossary of terms, and a key informant log were provided to each site investigator. Key

informants were defined as an individual or individuals with knowledge of the medical school curriculum and access to specific information about tobacco-related teaching content. Site investigators supervised the curriculum assessments over an 8-week period, working with coordinators who collected and coordinated information on current tobacco-related teaching. Using the key informant log, data coordinators recorded the name, title, position, and answers to questions for each respondent. Site investigators completed the detailed curricular evaluation. Details of this assessment phase are reported elsewhere.<sup>12</sup>

We inquired about required courses in years 1 and 2, clerkships, and electives. For each course or clerkship, respondents estimated the number of minutes of tobacco-related teaching and whether the teaching methodology was “didactic, skills training, applied skills, or a Web-based format.” Skills training was defined as role plays, counseling, video, modeling in small groups, or other forms of interactive teaching. Applied skills was defined as supervised clinical training in a practice setting. We also inquired about the major content themes and evaluation methods, if any.

Of note, this assessment identified major deficits, including a lack of skills teaching during clerkship years and suboptimal teaching in pediatric or obstetrics/gynecology clerkships. Overall, for the 4 years of medical school, schools reported that 36% of the courses had some inclusion of tobacco information. In all, 5 schools provided between 4 and 8 hours of teaching, 5 schools provided 10 to 13

hours, and 2 schools provided 17 and 18 hours of teaching. Of the 12 schools, 8 had fewer hours devoted to tobacco-related teaching in the clerkships than in the first year.<sup>12</sup>

### Establishing the Criteria to Guide the Development of Competencies

After summarizing the results of the curricula inventory, investigators systematically reviewed the recommendations for tobacco cessation and prevention. They also reviewed the development of competencies for similar health promotion activities in medical schools. Criteria for the definition of tobacco control competencies were drafted at the first national meeting of the Tobacco Prevention and Cessation Education Project consortium in October 2003. Criteria included the following: competencies should be taught in the preclinical and clinical years; competencies should be guideline driven or endorsed by practice organizations (e.g., American Academy of Pediatrics, American Academy of Family Physicians); competencies should encompass prevention, cessation, and public health, as well as larger issues of professional development and systems change; competencies must address cognitive, affective, and skill domains and place an emphasis on explaining basic concepts to patients.

### Review of Competency Development in Medical Schools

A competency-based model starts with defining the successful graduate, designs measures and standards of performance, and only then develops the learning experiences.<sup>13</sup> Epstein and Hundert have developed a useful def-

inition of a competency, that is, “the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and the community served.”<sup>14(p226)</sup> In articulating tobacco control competencies, we relied on precedents set forth by groups that developed competencies in diverse medical specialties, including graduate medical education, pediatrics, preventive medicine, cultural competency, geriatrics, and social and behavioral health.<sup>9–11,15–19</sup>

Carraccio et al.<sup>16</sup> outlined a 4-step process of developing competency-based curricula and evaluation for graduate medical education. The first step must be to identify the competencies. At this point, the broad categories in which medical students should have knowledge must be laid out, for example, patient care, office systems, and so forth. Next, the competency components and performance levels must be established. This demands that specific objectives be determined, for example, “counsel patients and families,” including the performance indicators and measurable thresholds, for example, “perform this task 25% to 50% of the time.” After these steps are taken, the competence, as well as the process of creating them, should be evaluated.<sup>16</sup>

In order to develop competencies that are also evidence based and relevant, it is important to gain consensus from a diverse group of experts. Pena Dolhun et al.<sup>15</sup> created an assessment tool to measure content areas, teaching methods, and skills sets in cross-cultural curricula across 19 medical schools. Using this tool, they were able to summarize the teachings in each school and fuse

the strengths of each curriculum, thus building a broad consensus and laying the groundwork to establishing competencies that are relevant and practical across all medical schools.

### Review of Tobacco Control Recommendations

Although tobacco control guidelines do not exist for medical students, we modified the guidelines for the requisite knowledge, attitudes, and skills and strategies for optimal communication for practicing physicians that are outlined by multiple sources, including randomized studies on improving clinician practices, surgeon general reports, federally sponsored recommendations, and guidelines from key practice organizations.<sup>20,21–34</sup> Key learning objectives and the required number of practice opportunities for tobacco counseling with adults and children were derived from standards established by the Cancer Education Committee at the Boston University School of Medicine<sup>35</sup> as well as the experiences at several consortium schools, including the Cancer Prevention and Control Education program at the University of Massachusetts Medical School.<sup>36</sup> Earlier studies of medical students found that student self-perceived skill levels for smoking cessation and prevention improved with at least 3 clinical encounters.<sup>35</sup>

### Consensus on the Competencies Needed to Guide Tobacco Modules

As precedence suggested, we followed an iterative process in which competencies were drafted, reviewed, revised, and then redistributed to all participants for final feedback. After

**TABLE 1—Overall Affective Objectives for Comprehensive Tobacco Control Curriculum**

A.1	Student should value physician's role in tobacco smoking prevention, assessment, screening, and treatment.
A.2	Student should value medical practice "team approach" for tobacco smoking prevention, assessment, screening, and treatment.
A.3	Student should value physicians' and health professionals' role in public health advocacy and participation.
A.4	Student should believe that tobacco cessation advice/patient-centered counseling is a learned skill and can be a highly effective skill.
A.5	Student should be able to empathize with addicted patients.
A.6	Student should respect the importance of keeping current with evidence-based findings in tobacco smoking prevention and control (e.g., epidemiological, behavioral, clinical, and policy science).
A.7	Student should develop confidence in his or her role as knowledgeable expert and ability to effect change at community and environmental level.
A.8	Student should appreciate that smoking cessation is a process; not all smokers are successful on first attempt.

we agreed on the core areas in which students should have knowledge and skills, the next step was to develop a plan for students to gain competency in the specified areas. We achieved this by indicating the particular skill that was needed by the medical student to achieve the desired attitude or knowledge level. The final competencies were developed with a consensus from every investigator at the 12 participating universities.

### Competencies

In order to guide curriculum development as well as enable evaluation, it is important to articulate learning objectives, including affective (Table 1), cognitive, and skills (Table 2) objectives. Competencies were organized according to (1) adult cessation and prevention competencies,<sup>3,19–26</sup> (2) pediatric cessation and prevention competencies,<sup>27–32</sup> (3) public health advocacy/population science competencies,<sup>3,5,6,33</sup> (4) support systems in clinic/medical setting competencies,<sup>3</sup> and (5) profes-

sional development/global competencies.<sup>13,34</sup>

### DISCUSSION

This consensus process for tobacco control competencies has brought together advocates for tobacco control teaching and curricular reform from throughout the United States. The exercise has been both academic and pragmatic. This kind of reality testing of competencies has furthered our appreciation for the resources and effort needed to structure education that is truly competency driven and competency based. On a larger scale, the Association of American Medical Colleges has declared its support for the shift to competency-based education and therefore may be important advocates for this curricular reform.<sup>37</sup>

After the establishment of the tobacco competencies and objectives, the consortium will develop modules that address these objectives and are suitable for implementation into current medical school curricula. New

tobacco education modules will be piloted at our consortium medical schools, evaluated, and, if successful, disseminated. This process may vary from school to school; however, curriculum committees, student organizations, and faculty representatives will be key resources for incorporating the curriculum according to the structure and process at their individual schools.

Two calls for action, spaced 12 years apart, have urged medical schools to adopt new tobacco control curricula and to serve as a major focal point for professional education. We hope that discussion of these competencies can rekindle a national discussion and lead to a strategic plan to include this vitally important new teaching. ■

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A. C. Geller and C. A. Powers assessed current schools. A. C. Geller, K. R. Brooks, J. Zapka, J. Ockene, and C. Dube established criteria for competencies. N. Rigotti and J. O'Donnell reviewed recommendations. K. R. Brooks, C. A. Powers, J. O'Donnell, A. C. Geller, and J. Zapka wrote the discussion and conclusions. K. R. Brooks did the literature review. All authors wrote sections of the

**TABLE 2—Cognitive (C) and Skill (S) Objectives by Competency Area**

**Adult cessation and prevention**

Pathophysiology, addiction

- C.1 Understand the pathophysiology (tissues, systems) of tobacco use and the mechanisms of addiction.
- C.2 Understand the pathophysiology, mechanisms, and behavioral manifestations of nicotine withdrawal.
  - S: Be able to explain the effects of tobacco use, its addictive properties, and the physiological effects of withdrawal to patients.
  - S: Know how to intervene to help patients decrease withdrawal symptoms.

Epidemiology, disease causation

- C.1 Understand personal and family health risks associated with tobacco use.
  - S: Be able to explain risks of tobacco use, including its effect on cancer, oral disease, and the cardiovascular, cerebrovascular, respiratory, endocrine, and reproductive systems.
  - S: Be able to explain the risks of environmental tobacco smoke for people other than the smoker with a special emphasis on people living in a smoker's household.
- C.2 Understand the prevalence of tobacco use among adults, particularly among high-risk, low-socioeconomic status groups.

Counseling, efficacy, and principles

- C.1 Be aware of the beneficial effects of quitting at all ages in terms of overall health, reduced risk of disease, and personal/social issues.
  - S: Be able to explain the benefits of quitting smoking for each major age group.
- C.2 Understand the basic principles of patient-centered counseling.
  - S: Be able to practice patient-centered counseling with at least 3 patients.
- C.3 Know the meaning of each affective objective and associated questions in the 5A's for tobacco treatment (ask, advise, assess, assist, arrange follow-up).
- C.4 Understand the transtheoretical model and its component stages of change, including readiness to quit.
  - S: When given 3 different patient scenarios, be able to identify the patient's stage of change and perform an appropriate patient-centered interview.
- C.5 Know at least 3 sources for patient referral.
  - S: Be able to provide at least 3 patients with appropriate referrals.
- C.6 Understand the basics of insurance reimbursement, coding, and other entitlements (e.g., Medicaid) for tobacco cessation treatment.
- C.7 Understand available over-the-counter medications (e.g., NRT) and their relative costs.
- C.8 Be aware of an effective office visit management system that would allow time for patient-centered tobacco cessation counseling.

Pharmacology and efficacy

- C.1 Understand the pharmacological mechanisms of the full range of pharmacotherapy available for tobacco treatment, including the use of nicotine replacement and antidepressants.
- C.2 Understand the advantages of pharmacotherapy over other cessation strategies (e.g., cold turkey).
- C.3 Understand patient instructions for effective use of pharmacological forms of tobacco cessation.
- C.4 Understand how to assess and tailor the type of pharmacotherapy and the dose appropriate to individuals.
  - S: Be able to use patient-centered counseling with at least 3 patients and include pharmacological therapy.

Issues of culture, gender, age, and family

- C.1 Understand the risks and benefits of smoking in common cultural groups and family structures.
  - S: Be able to employ culturally competent and family-sensitive patient-centered tobacco treatment strategies with at least 3 patients.

Special issues: pregnancy, weight gain related to smoking

- C.1 Understand the range of risks related to smoking during pregnancy.
- C.2 Understand the high risk of relapse for postpartum women who stopped smoking while pregnant and who have recently delivered their children.
  - S: Be able to provide patient-centered tobacco counseling to pregnant women at least 3 times.
  - S: Be able to provide patient-centered counseling at least 3 times to women who stopped smoking and who have recently delivered their children.
- C.3 Understand the safety of using NRT and bupropion HCl in pregnant women.
- C.4 Understand barriers to smoking cessation, including weight gain, stress, and smokers in family and close social circles.
  - S: Be able to demonstrate patient-centered counseling skills taking into account barriers to quitting with at least 3 patients.
  - S: Be able to provide counseling regarding methods for avoiding weight gain, stress, and so forth.

**Pediatric prevention and cessation**

Epidemiology

- C.1 Understand the major risks of environmental tobacco smoke exposure to children in the household.
  - S: Be able to perform patient-centered counseling with at least 3 parents regarding the effect of smoking on their children.
- C.2 Understand the prevalence of smoking in the pediatric population.

*Continued*

article, and A. C. Geller, J. Zapka, and K. R. Brooks prepared the final article.

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**Human Participant Protection**

The Boston University Institutional Review Board approved this study protocol.

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**TABLE 2—Continued**

Counseling, efficacy and principles (with children and adolescents)

- C.1 Be able to identify developmental issues and age-appropriate interventions for tobacco treatment and provide age-appropriate anticipatory guidance through patient-centered counseling.
  - S: Be able to perform tobacco prevention patient-centered counseling with at least 3 children.
  - S: Be able to perform tobacco prevention patient-centered counseling with at least 3 adolescents.
  - S: Be sensitive to issues of child and parent confidentiality.
  - S: Be able to provide parents who smoke with information about the most effective quitting strategies.
- C.2 Know the meaning of each affective objective and associated questions in the 5A's for tobacco treatment.
- C.3 Know the medical literature regarding vulnerability to tobacco use and quick onset of addiction properties with early tobacco use.
  - S: Be able to discuss vulnerability to tobacco use and quick onset of addiction with early tobacco use with at least 3 children and 3 adolescents.
- C.4 Know resistance skills to early onset of smoking with children and adolescents.
  - S: Be able to discuss the use of resistance skills when smoking is offered or part of the patient's environment (e.g., peer pressure, parents smoke) with at least 3 children and 3 adolescents.
- C.5 Know at least 3 sources for pediatric smoking cessation referral, including Internet resources.
  - S: Be able to provide at least 3 patients with appropriate sources for patient referral.
- C.6 Know at least 3 signs of nicotine dependence.
  - S: Be able to assess nicotine dependence with at least 3 pediatric patients.
- C.7 Know that every child and adolescent should be asked about tobacco use.
  - S: Understand pediatric tobacco prevention and patient-centered tobacco counseling.
  - S: Be able to provide a tailored smoking prevention message based on age-appropriate concerns (e.g., the "truth" campaign).
- C.8 Be aware of different settings of care outside the medical practice/care environment that may affect a patient's health in a positive way and be able to tap into these external care resources for adolescents (e.g., YMCA sport activities).
- C.9 Be aware of the need for pediatricians and other medical professionals treating a child or an adolescent smoker to encourage the patient to set a quit date.
  - S: Know how to counsel children and adolescents on smoking cessation and be knowledgeable about setting goals to quit with children and adolescents.

Counseling, efficacy and principles (with parents)

- C.1 Be aware of parent's role in providing health information to their children.
  - S: Be able to provide tips to parents regarding smoking prevention and cessation counseling for their children.
- C.2 Understand the role of parent modeling in shaping children's behavior.
- C.3 Understand the potential for adult patient-centered tobacco counseling in the pediatric arena.
  - S: Be able to perform the 5A's for patient-centered tobacco cessation counseling with at least 3 parents.

**Public health advocacy/population science**

- C.1 Be aware of successful anti-tobacco initiatives outside the clinical setting, including legislative, policy, media, and partnership building.
- C.2 Be able to demonstrate awareness of key public health strategies and advocacy processes for tobacco prevention.
- C.3 Be aware of current international policy recommendations for curtailing tobacco use.
- C.4 Understand the influence of the media on tobacco use, behavior, and attitudes toward tobacco.
- C.5 Demonstrate an awareness of restructuring of health systems, including reimbursement required to have an effect on optimal cessation practices.
  - S: Have the ability to articulate the role of organization, practice, and individual in affecting tobacco policy.

**Support systems in clinical/medical setting**

- C.1 Be aware of the evidence concerning effectiveness of practice systems (e.g., chart stickers, reminder systems).
- C.2 Be able to measure clinicians' actions (i.e., tracking systems) so they are held accountable.
- C.3 Understand that a high "standard of care" depends on a team approach.
- C.4 Be aware of organizational policies in medical offices and clinics that support tobacco-free goals (e.g., smoke-free policies that maintain smoke-free environments; "no smoking" signs posted visibly; and public information pamphlets available in easy-to-read formats).
  - S: Be able to demonstrate application of system-based practice/practice-based learning that follows the 2000 Public Health Service guidelines.
  - S: Be able to apply principles of quality improvement approaches in the practice setting.

**Professional development/global**

- C.1 Know resources (or how to access resources) for current information on new standards, new practices, and learning objectives.
  - S: Be able to demonstrate sources/skills that enable medical professionals to keep current with tobacco information and trends.
  - S: Be able to demonstrate critical appraisal of intervention modalities.

Note. NRT = nicotine replacement therapy.

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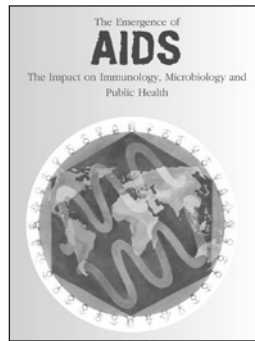
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