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# Teaching Patient-centered Tobacco Intervention to First-year Medical Students

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**The University of Wisconsin's Tobacco Intervention Basic Skills curriculum (TIBS) was inaugurated to begin training 147 first-year medical students in skills for promoting health behavior change. Learning activities included lecture, demonstration, reading, quiz, role-play exercises, and standardized patient interviews. After TIBS, the 69 students who provided pre- and postintervention data exhibited more therapeutic attitudes and increased knowledge and self-confidence in applying TIBS skills. Two months later, 52% of the 109 posttest respondents had applied TIBS in clinical settings, often for behaviors other than tobacco use. We conclude that medical students can gain from early training on promoting behavior change.**

**KEY WORDS:** undergraduate medical education; competency-based education; tobacco use cessation; health promotion; program evaluation.

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Promoting behavior change is an essential skill for physicians, as many individuals die of conditions directly linked to health risk behaviors.<sup>1,2</sup> Competence in tobacco intervention is most critical, as tobacco use is an especially common contributor to premature death and disability,<sup>1,2</sup> and behavioral interventions are effective and synergistic with pharmaceutical treatments.<sup>3–6</sup>

Previous studies have shown that resident physicians<sup>7–11</sup> and advanced medical students<sup>12–14</sup> can learn smoking cessation counseling techniques and improve patients' smoking outcomes.<sup>15</sup> Teaching on therapeutics has typically been reserved until the third year of the medical school curriculum.

Earlier training on promoting behavior change might be advantageous. Earlier acquisition and application of skills in promoting behavior change might enhance first- and second-year medical students' sense of belonging and usefulness in clinical environments. Training on such skills might reinforce the importance of fundamental communication skills, such as building rapport, attending to affective issues, and cross-cultural communication. It also might help instill in trainees whose professional identities are still emerging the ethic that promoting behavior change is central to medical practice.

These advantages could only be realized if teaching these skills earlier were feasible and acceptable to medical students. This study aimed to determine whether a curriculum on tobacco intervention could garner student acceptance; improve relevant knowledge, attitudes, and self-confidence; and be applied in students' early clinical experience. This paper describes the design and evaluation of the Wisconsin Tobacco Intervention Basic Skills curriculum (TIBS), the first experience in a new longitudinal curriculum on promoting behavior change.

## PROGRAM DESCRIPTION

### Target Audience

The targeted learners were the 147 first-year medical students in the class of 2005 at the University of Wisconsin-Madison. Eighty-three (56.5%) of the students were female; 64 (43.5%) were male. Mean age and standard deviation were  $22.6 \pm 3.1$  years; 7 (5%) of the students were age 30 or above.

### Behavior Change Model

We selected motivational interviewing<sup>16,17</sup> as a framework for promoting behavior change. Motivational interviewing embraces the Rogerian view that empathy, warmth, and positive regard are essential for therapeutic gain.<sup>18</sup> It also draws on Prochaska and DiClemente's transtheoretical model of behavior change,<sup>19</sup> which submits that, regardless of other operative theories, all individuals progress through defined stages of readiness to change. These stages include precontemplation (not considering change), contemplation (ambivalent about change), determination (committed to change), action (implementing change), and maintenance (change is well established). The model considers relapse a normal stage of change and an opportunity to learn from mistakes and recommit. Motivational interviewers help patients who are not committed to change reflect on the advantages and disadvantages of change in light of their personal life goals and values. Motivational interviewers help patients who are committed to change design their own change plans in consonance with their own goals and values, assess their progress, and refine their plans as needed. Stage-based interventions<sup>20</sup> and motivational interviewing<sup>21–23</sup> have been found effective in promoting change in a variety of unhealthy and risky behaviors. Other attractive features of motivational interviewing are its inherent cultural sensitivity and the compatibility of its emphasis on empathy, respect, and partnership with current teaching on communication skills.

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## Curriculum Development

Several principles guided curriculum development. The greatest instructional emphasis should be skills development. The intervention model should be structured yet flexible to respond to patients' needs and clinicians' time constraints. Practicing physicians should provide role modeling on the importance of these skills in clinical practice. Sequential learning steps should include knowledge acquisition, skills demonstration, skills practice and feedback, and reinforcement by application in clinical settings. Scarce instructional time should be reserved mainly for skills demonstration and practice and constructive feedback. The curriculum should provide appropriate incentives for learning, such as observed and graded exercises. Retention should be promoted through repetitive practice with a pocket-sized skills checklist<sup>24</sup> and resource summary, not memorization.

## Curriculum Content and Activities

The Wisconsin TIBS curriculum was developed from materials on motivational interviewing,<sup>16,17,25</sup> guidelines on smoking cessation,<sup>5</sup> and the University of Arizona's Cessation Skills Certification Guide.<sup>26</sup> A 70-page manual<sup>27</sup> served as the text. Designed for use in clinical settings, an accompanying pocket guide summarized the intervention model, key resources, and information on referral options and pharmacotherapy.

TIBS teaching occurred in the second of four semesters of a required course on basic interviewing and physical exam skills. Table 1 shows the sequence of learning activities and their key components. The quiz was intended to ensure adequate knowledge before the workshop. Six to eight students attended one of 20 separate workshops taught by 8 general internists, 8 family physicians, and 4 pediatricians. The final 90-minute workshop segment was

conducted as a modified Objective Structured Clinical Skills Examination station, with feedback on each student offered by the instructor and other students. The faculty found that all students demonstrated basic competence. Students were encouraged to apply TIBS skills during their Generalist Partners Program (GPP) experience,<sup>28</sup> in which each student spends 3 half-days per semester seeing patients with a primary care physician preceptor.

## EVALUATION

### Evaluation Methods

Student endorsement of the curriculum and its components was gauged by a confidential evaluation questionnaire, which was administered at the conclusion of their TIBS workshops. Students provided ratings using 7-point Likert-type scales with anchors at the midpoints and the extremes.

Gains in students' attitudes, knowledge, and self-confidence were assessed by comparing responses to pretest and posttest versions of the Learning Outcomes Questionnaire (LOQ), which was modified from a previous study.<sup>29</sup> The pretest version was administered immediately before the first lecture; the posttest, 2 months after the TIBS workshop.

In the LOQ, the first 4 items assessed attitudes regarding physicians' roles; the next 8, beliefs regarding the reasons patients maintain unhealthy behaviors despite physician advice; and the next 4, self-confidence to apply knowledge and implement motivational interviewing skills. Subsequently, as a knowledge test, 2 items asked students in an open-ended manner to provide 3 suggestions for promoting behavior change for each of 2 cases, one depicting a patient in precontemplation, and one depicting a patient in determination. The score assigned to each item was the number of suggestions (0 to 3) that adhered to principles

Table 1. TIBS Learning Activities

Learning Activities	Key Components
1. Attend a 2-hour lecture	<ul style="list-style-type: none"> <li>• Introspective exercises on behavior change</li> <li>• Introduction to stages of readiness to change and principles of motivational interviewing</li> <li>• Demonstration of TIBS skills with standardized patient</li> <li>• Importance of tobacco use to public health</li> <li>• The nature of tobacco addiction</li> </ul>
2. Read the TIBS manual	
3. Review the TIBS pocket guide	<ul style="list-style-type: none"> <li>• Stages of readiness to change and principles of motivational interviewing</li> <li>• The ASK, ASSESS, and ASSIST steps<sup>5</sup> adapted to adhere better to motivational interviewing principles</li> </ul>
4. Take a 20-item, open-book, Internet-based quiz	<ul style="list-style-type: none"> <li>• Additional clinical resources—options for building change plans, local referral resources, information on pharmacotherapy</li> </ul>
5. Attend a 4-hour workshop	<ul style="list-style-type: none"> <li>• Role-play exercises among pairs of students</li> <li>• Group exercise with standardized patients</li> <li>• Faculty assessment of student competence via observation of each student with standardized patient</li> </ul>
6. Apply TIBS skills in clinical settings	<ul style="list-style-type: none"> <li>• Implement TIBS with actual patients</li> </ul>

of motivation, as judged by 3 experienced counselors who were blinded to whether responses appeared in pretests or posttests. Disparate ratings were resolved by consensus.

Finally, the LOQ elicited self-reports on use of stage-based motivational techniques for promoting changes in several listed health-related behaviors in the students' clinical settings. For the pretest, the specified timeframe was since the beginning of the year; for the posttest, since the TIBS workshop.

Means and standard deviations were calculated for each item of the evaluation questionnaire. Pre- and posttest comparisons of LOQ items were conducted with paired *t* tests for students who had completed both questionnaires, and with nonpaired, 2-sample *t* tests for all submitted data. Effect sizes were computed as the absolute value of the difference between the posttest and pretest scores divided by the mean of the standard deviations for each.<sup>30</sup> Frequency distributions were produced for the self-reported data on the use of new skills in practice. Analysis was performed with standard statistical software.<sup>31</sup>

## Evaluation Results

One hundred twenty-nine (87.8%) of the students completed the evaluation questionnaire at the conclusion of the TIBS workshop. Eighty-eight (59.9%) of the students attended the initial lecture and completed the LOQ pretest; 109 (74.1%) completed the LOQ posttest; and 69 (46.9%) completed both. One hundred and three (70.1%) of the students completed the questions on applying TIBS in clinical practice.

Student ratings on the TIBS curriculum and its components are shown in Table 2. In response to open-ended questions, many students suggested reducing workshop time for practice and feedback and conducting the final skills assessment without student observers. Nearly two-thirds (64%) of the students gave the entire curriculum one of the top two ratings. Additional unsolicited feedback included several positive comments on the end-of-semester course evaluation form, and several requests from second- and third-year students for TIBS training.

Table 3 shows that students manifested more favorable attitudes regarding physician roles in promoting behavior change (items 1 to 4), less judgment toward non-adherent patients (items 5 to 12), and more self-confidence in applying TIBS knowledge and skills (items 13 to 16) after TIBS curriculum exposure. For items 17 and 18, responses to case scenarios improved after TIBS. For all 18 items, categorical results regarding statistical significance for pretest and posttest comparisons ( $P < .05$ ) were identical for the paired *t* tests and the nonpaired, 2-sample *t* tests (results not shown).

Four students reported having used motivational interviewing techniques before TIBS. Table 4 shows that many students reported using TIBS in clinical settings after exposure to the TIBS curriculum.

**Table 2. Student Ratings of TIBS Curriculum and Components**

	Results
Lecture	
Organization	2.2 ± 1.0
Clarity	2.0 ± 1.0
Usefulness	2.4 ± 1.3
Effectiveness at demonstrating skills	2.3 ± 1.2
Time*, %	
Too little	52
About right	47
Too much	1
TIBS guide	
Organization	2.0 ± 1.1
Clarity	2.1 ± 1.1
Usefulness	2.3 ± 1.2
Complexity of material*, %	1.0 ± 0.4
Too simple	8
About right	87
Too complex	5
Internet-based quiz	
Usefulness in preparing for workshop	3.4 ± 1.7
Appropriateness of material covered	2.7 ± 1.5
Workshop	
Preparation of instructors	1.3 ± 0.8
Knowledge of instructors	1.2 ± 0.4
Organization	2.0 ± 1.2
Usefulness	2.1 ± 1.4
Time spent*, %	
Too little	2
About right	36
Too much	62
Entire curriculum	
Clarity of learning objectives	1.9 ± 0.9
Relevance of learning objectives	2.0 ± 1.2
Sequence of learning activities	2.3 ± 1.4
Appropriateness for my level of training*, %	
Too easy	3
About right	95
Too hard	2
Overall learning experience	2.5 ± 1.4

\* Shown as percentages endorsing each listed response. Other results are reported as means and standard deviations of ratings from 1 to 7, with 1 being the highest.

TIBS, Tobacco Intervention Basic Skills curriculum.

## CONCLUSION

First-year medical students favorably received the initial implementation of the Wisconsin TIBS curriculum. Most students found the educational content important and appropriate for their level of training.

Although the major purpose of TIBS was skill building, TIBS elicited significant attitudinal shifts. After TIBS, students' extant sense of responsibility for promoting behavior change was enhanced, and students more strongly rejected pejorative explanations for patients' unhealthy behaviors. Several effect sizes were near, at, or higher than a medium strength of 0.5.<sup>30</sup> These findings are in accord with cognitive dissonance theory,<sup>32</sup> which states that new experiences can change both attitudes and behavior. Learning activities

Table 3. Comparison of Pre- and Postintervention Responses to the Learning Outcomes Questionnaire

Item	Agreement*		P Value <sup>†</sup>	Effect Size
	Pretest	Posttest		
1. Part of a physician's duty is to help patients change their unhealthy and risky behaviors.	1.9 ± 1.2	1.4 ± 0.8	.004	0.50
2. Physicians can help many patients change their unhealthy and risky behaviors.	2.6 ± 1.0	2.1 ± 1.2	.006	0.45
3. Physicians should expect their patients to have relapses after changing their behaviors.	3.1 ± 1.7	1.8 ± 1.3	.000	0.87
4. Physicians who have provided complete information on treatments have fulfilled their obligation, even if patients don't follow the advice.	3.2 ± 1.7	3.5 ± 1.8	.367	—
Patients frequently do not change unhealthy or risky behaviors, despite advice and information provided by concerned physicians, because...				
5. they don't care about their health.	3.2 ± 1.5	5.5 ± 1.4	.000	1.6
6. they lack self-discipline.	3.4 ± 1.6	4.5 ± 1.7	.000	0.67
7. they are focused on other priorities.	2.6 ± 1.4	2.8 ± 1.4	.303	—
8. they lack sufficient information about health effects and/or risks.	3.6 ± 1.5	4.0 ± 1.7	.125	—
9. they lack intelligence.	5.7 ± 1.4	6.0 ± 1.3	.287	—
10. they don't try hard enough.	5.5 ± 1.5	4.9 ± 1.6	.031	0.39
11. they don't believe they can change.	2.7 ± 1.4	2.3 ± 1.1	.020	0.32
12. their physicians lack skills in promoting behavior change.	3.6 ± 1.3	3.1 ± 1.4	.016	0.37
13. I feel knowledgeable about Prochaska and DiClemente's stages of readiness for change.	6.3 ± 1.4	1.9 ± 1.0	.000	2.8
14. I feel that I am able to conduct an interview to assess a patient's readiness to change unhealthy or risky behavior, using the Prochaska and DiClemente model.	6.3 ± 1.4	2.0 ± 1.0	.000	3.6
15. I feel I know which motivational interviewing techniques should be applied at particular stages of readiness to change.	2.6 ± 2.1	1.9 ± 0.8	.006	0.49
16. I feel able to use motivational interviewing techniques in helping actual patients change their unhealthy and risky behaviors.	2.8 ± 1.9	2.0 ± 0.9	.001	0.57
	Number of Responses Judged Adherent to the TIBS Model		P Value <sup>†</sup>	Effect Size
17. Case of patient in precontemplation.	0.7 ± 0.8	2.1 ± 1.0	< .0001	1.6
18. Case of patient in determination.	1.2 ± 1.0	2.2 ± 0.9	< .0001	1.1

\* For items 1 to 16, 1 = strongly agree; 4 = neutral or uncertain; 7 = strongly disagree.

<sup>†</sup> P values from paired t tests comparing pretest and posttest responses for 69 students. TIBS, Tobacco Intervention Basic Skills curriculum.

that could have elicited cognitive dissonance were introspective examinations of students' process of changing their own unhealthy behaviors and favorable experiences discussing behavior change with standardized and actual patients. Role modeling by primary care faculty may have helped, too.<sup>33</sup>

Students demonstrated improvement in perceived and actual knowledge and in perceived skills to promote behavior change. The curiously high self-reported baseline knowledge about motivational interviewing (items 15 and 16) could have emanated from an assumption that the phrase referred to generic attempts to promote behavior change.

The high number of students who used the TIBS model with actual patients in primary care settings bodes well for long-term retention of the skills. The students' extension of the model to behaviors other than tobacco reflects an advantage of teaching a general model of promoting behavior change rather than specific techniques for specific behaviors.

This initial study of the TIBS curriculum had some important limitations. The study demonstrated only short-term changes in attitudes and knowledge. The study did not document in a blinded, objective manner whether students' skills were enhanced for standardized or actual patients. Historical effects cannot be excluded, because there was no control group. However, any such effects were probably small, because most students reported that their GPP preceptors were not familiar with motivational interviewing, and other coursework was unrelated.

Brown and Oriel previously found that self-selected first-year medical students improved their attitudes, knowledge, and self-confidence in skills for promoting behavior change after a 14-hour elective course on motivational interviewing.<sup>29</sup> It was unclear whether this finding hinged on self-selection. Subsequently, Papadakis et al.<sup>34</sup> found that first-year medical students, as a group, readily accept training in tobacco intervention. The current study echoes their findings. The current study is unique,

Table 4. Students' Self-Reports of TIBS Skills Use

Health Behaviors	Number (%)
Tobacco	57 (52)
Exercise	50 (46)
Diet	45 (41)
Alcohol	24 (22)
Medication adherence	23 (21)
Home and vehicular safety	22 (20)
Safe sexual practices	14 (13)
Illicit drug use	12 (11)
Domestic violence	7 (6)

The data shown are the number of students who stated that they had used TIBS skills to counsel patients on the various health risk behaviors. The percentage reflects proportions of the 109 students who responded to this questionnaire.

TIBS, Tobacco Intervention Basic Skills curriculum.

however, in its employment of tobacco intervention training as an initial experience for training medical students in promoting a variety of changes in health risk behaviors, and in its findings that students can be prompted to apply new tobacco intervention skills in practice and extend the model to other behaviors.

If first-year students can gain from training on promoting behavior change, should such training start in the first year? A study comparing individuals trained under different curricula could provide a definitive answer. Until then, theory would predict yes. Expectancy value theory suggests that trainees would be more disposed to promote behavior change after exposure to greater numbers of positive experiences and respected individuals who supported such behaviors.<sup>35</sup> Social learning theory would forecast further that enhanced opportunities for practice, feedback, and role modeling would enhance the frequency and fidelity of performance.<sup>33</sup> Current physician inattention to risky and unhealthy behaviors,<sup>36</sup> the high mortality and morbidity associated with them, the lack of data to support the traditional curricular sequence, and, now, the potential for first-year students to begin gaining from training on promoting behavior change argue for including such training in the first year.

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