Tobacco Cessation, the Dental Profession, and the Role of Dental Education

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Abstract: This article describes the development of a comprehensive, interdisciplinary, tobacco cessation program based on twenty years of experience at the Indiana University (IU) School of Dentistry. It reviews the relationship between tobacco use and oral health, the nature of nicotine addiction and cessation approaches involving nicotine replacement therapy. In the early 1980s, tobacco control curriculum and cessation guidelines were introduced at the IU School of Dentistry and cooperative efforts initiated with other U.S. and Canadian dental schools. During the past decade, an interdisciplinary Nicotine Dependence Program has been developed to serve outpatients receiving treatment at all hospitals on the IU Medical Center campus. It is hoped that the models described here will be of value to other dental schools developing educational curricula and tobacco control and cessation programs.

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“Today is not yesterday. We ourselves change. How then can our works and thoughts, if they are always to be the fittest, continue always the same? Change, indeed is painful, yet ever needful; and if memory has its force and worth, so also has hope.”

—Thomas Carlyle (1795-1881)

During the past twenty years in North America, dental office-based tobacco cessation and education efforts have evolved slowly but steadily.1,2 The idea that dental professionals can actively help their patients quit smoking cigarettes and stop using smokeless tobacco (ST) is a concept whose “time has truly come.”3 In 1980, tobacco research, education, and cessation programs were first initiated at the Indiana University School of Dentistry (IUSD). Since then, dental professionals from this institution have developed and implemented a wide spectrum of tobacco control programs at local, state, national, and international levels.4,5 The purpose of this article is to describe the approaches to tobacco cessation and education that have been successfully employed at IUSD for more than twenty years.

Tobacco: An Oral Health Problem

Since the early 1970s, dental professionals have become increasingly aware of the damage that smoked and smokeless tobacco causes to tissues in and around the oral cavity.6-10 Ranging from mild to life-threatening, the following tobacco-related oral conditions may develop: halitosis, hairy tongue, dental calculus, periodontal disease, acute necrotizing ulcerative gingivitis, abrasion, discoloration of teeth and restorative materials, miscellaneous tissue changes, delayed wound healing, sinusitis, leukoplakia, and oral cancer. Additionally, tobacco use increases and complicates treatment risks by compromising the prognosis for periodontal and other oral diseases and increasing the likelihood of the occurrence and reoccurrence of mouth cancers (see the first section of this issue for more detailed information). However, oral health team members are in an ideal position to give their patients specific, authoritative information concerning the adverse oral effects of tobacco use.

Understanding Nicotine Addiction

Before exploring effective ways to help smokers quit, it is important to understand the nature of the addictive process and how it affects both nicotine use and cessation attempts. Compulsive tobacco (nicotine) use, defined as a legitimate addiction by the U.S. Surgeon General, can be conceptualized at the central connecting link in a three-linked chain (Figure 1). As an ingestive disorder, nicotine (a mood-
altering drug) is taken into the body excessively and compulsively, causing physiologic tolerance, tissue dependence, psychic dependence, and relatively well-defined physical withdrawal symptoms. The two additional, outside links to the chain, psychological dependence and sociocultural factors, interconnect with this common core and with each other as well. As nicotine dependence develops, a corresponding set of emotions and behaviors perpetuates the act of smoking. Tobacco use is learned, and typically initiated during adolescence, when the need to achieve acceptance through peer conformity is particularly strong. These conformity pressures are compounded by the influence of mass media messages, which portray smokers as being highly attractive, sophisticated, and socially energetic.

Both clinicians and patients need to identify the factors that have created nicotine dependency. Additionally, they must confront and deal with the entire addictive process, by planning a treatment modality that is utilized over an extended time period.\textsuperscript{11,12} Because nicotine dependency has such devastating consequences, the physical, psychological, and social problems of heavy smokers must be thoroughly addressed.\textsuperscript{13-16} Health care providers should also pay special attention to the tobacco industry’s most vulnerable population target groups: women, pregnant females, adolescents, individuals of lower socioeconomic status, the unemployed, minorities, and persons with low educational levels.\textsuperscript{16,17}

**Nicotine Replacement Therapy**

Between the 1980s and 1990s, eight published research studies from the Oral Health Research Institute at IUSD documented the concept that dentally oriented smoking cessation programs, utilizing FDA-approved forms of nicotine replacement therapy (NRT), are both safe and effective. These investigations revealed smoking cessation quit rates ranging from 12 to 26 percent in those persons using NRT, as compared to 5-12 percent in individuals using a placebo product. Thus, these results clearly demonstrate that dental team efforts, accompanied by a structured behavioral program that utilizes NRT, produce significant success rates.\textsuperscript{18,19}

Between 1982 and 1984, Nicorette®, a nicotine-containing gum, was being developed as a smoking cessation aid. In an investigation of this product conducted at the Indiana University School, 208 smoking subjects were provided with either a placebo or nicotine-containing medicated gum for a six-week period. At the end of fifteen weeks, persons taking the nicotine medication had a quit rate three times greater than did those using the placebo.\textsuperscript{20} Moreover, nicotine gum use, as compared to placebo gum use, was found to have no significant influence on any examined oral health parameter.\textsuperscript{21-23} Reports of side effects experienced from nicotine gum intake were similar in both the control and the placebo groups. Some individuals using nicotine gum experienced a sore throat, hiccoughs, and nausea when chewing the product too vigorously. However, upon slowing their chewing rate, their symptoms ceased. In the mid-1980s, the IU Schools of Dentistry and Medicine conducted a comprehensive, five-year study supported by the National Institutes of Health (National Cancer Institute),\textsuperscript{23-25} in which Indianapolis-area physicians and dentists were evaluated as they attempted to help their patients to quit smoking. The investigation revealed that private practice dentists were very effective in their patient-directed cessation efforts. These dental professionals used either nicotine gum, dental chart reminders of the patient’s smoking status, or both. More than 1,000 participants received information on smoking consequences and instructions for both smoking management and the administration of nicotine polacrilex therapy, via the prescribed use of Nicorette®. At the end of one year, the group using nicotine gum showed slightly more than a 16 percent cessation rate, as compared to about 8 percent in the control group. Additionally, when smoking status reminders were attached to patient charts, dentists more consistently asked about each patient’s smoking behaviors.

Between January and April 1992, smoking cessation information was sent to every state dental
board in the United States validating the dentist’s role in prescribing nicotine gum and/or patches. While some states had not yet granted dentists the authority to prescribe these products, this occurred within the next few years. It is now legal for all U.S. dentists to prescribe FDA-approved, pharmaceutical agents to help their patients quit tobacco use.

Tobacco Cessation Programs

In 1970, Christen was among the first to suggest specific guidelines for dental office-based smoking cessation activities.26 By the late 1970s and early 1980s, occasional dental articles focused on tobacco use and cessation.27 However, dentists were not typically involved in cessation, and it was not linked to the practice of dentistry.

Although dental professionals may have observed the adverse effects of tobacco use among their patients, they often hesitated to mention the correlation or to advocate quitting for traditionally this had not been part of their responsibility. However, recent research has shown that dental patients now “expect” oral health professionals to inquire about their tobacco usage.

As more information on dentally oriented tobacco cessation research studies began to be published, dental institutions were encouraged to start formal programs.28 In the mid-1980s, Indiana University, the University of Kentucky, and the National Cancer Institute began to encourage oral health team members to become active in tobacco education, control and cessation.29

The health risks of smokeless tobacco, particularly among young people, have been documented in a series of publications,30-39 and we have consistently attempted to include it in our control and cessation efforts. The 1986 Surgeon General’s Report on smokeless tobacco, which emphasized the oral effects, stimulated considerable interest among dental educators and researchers. However, this growing health hazard has yet to be effectively addressed within the practice of dentistry. Currently, less than 18 percent of snuff or chewing tobacco users claim to have ever received quitting advice from a physician or dentist.40 (See also the article by Drs. Gordon and Severson in this issue.)

Development of a Tobacco Cessation Curriculum

In the early 1980s, an eight-step procedure, outlined in a fifty-one-page teaching manual (now in its fourth edition), was developed at the Indiana University School of Dentistry.28 By following this approach, dental professionals can establish a practical, efficient, and low-key program that involves minimal time expenditure and virtually no disruption in office routine. For the past ten years, this strategy, which closely parallels several National Cancer Institute (NCI) programs, has been taught to undergraduate, graduate, and dental hygiene students at the IUSD. Dental students routinely receive seven clock hours of lecture in tobacco control issues and dental office cessation strategies. Students are encouraged to bring their dental patients to this program and to observe the treatment planning aspects of tobacco cessation care. This active smoking cessation effort helps staff, faculty, students, and patients to quit smoking.

Guidelines for a Tobacco Cessation Program

The current IUSD tobacco education curriculum has evolved over the past two decades, as new standards of care have developed.3,32,41-43 Our plan is designed as an aid for all oral health care providers who wish to help their patients quit using tobacco. Additional guidelines that drive our program are found in: “Cessation of Tobacco Use” in the ADA Guide to Dental Therapeutics41 and Treating Tobacco Use and Dependence: Clinical Practice Guidelines,42 issued by the Public Health Service. Also, the CDC’s Best Practices for Comprehensive Tobacco Control Programs,43 issued in August 1999, has provided us with helpful direction (see also the article by Dr. Robert Mecklenburg in this issue). The following principles summarize our approach to office-based tobacco-cessation28:

- For brief intervention, as defined by the Public Health Service’s Clinical Practice Guidelines (2000), use the “five As.” In summary, ASK patients about their tobacco behaviors at every appropriate opportunity; ADVISE all tobacco users
to stop; ASSESS the patients’ willingness to make a quit attempt; ASSIST them in stopping; and ARRANGE for supportive follow-up procedures.

- Select a tobacco-cessation office coordinator. In a dental office, the dental hygienist logically assumes this role. All office workers need to have some involvement in the overall program in order to project a consistent and unified effort.
- Create a smoke-free office environment. It is imperative for employees to serve as nonsmoking role models and provide a cessation-oriented atmosphere. This setting enhances professional credibility and the patient’s motivation to remain or become tobacco-free.
- Identify all tobacco-using patients in the practice, note this information on individual records, and update it regularly.
- Develop patient-targeted smoking-cessation plans. Show tobacco-using patients the adverse effects of their addiction and offer cessation advice. This may involve only three to five minutes of office time.
- To maximize long-term success, use nicotine replacement therapy (NRT) or other FDA-approved medications in conjunction with a behavioral program. To clarify usage concerns, invite a pharmaceutical company representative to visit the dental office in order to explain to all personnel the proper use of FDA-approved tobacco cessation prescription items. When treating tobacco-related oral conditions (e.g., periodontal disease), dentists can legally administer these products.
- Provide supportive follow-up both to those who show interest and to those who have initiated the quitting process. Express concern that is free of pressure, judgment, and manipulation.
- Offer tobacco intervention advice and support as an ongoing, integral part of dental services. Because many patients make multiple quitting attempts before they succeed completely, they can be helped and encouraged as they seek routine dental care.

Tobacco Control Activities in North American Dental Schools

In late 1999, Barker and Williams stated that eleven U.S. dental schools and sixty-five dental hygiene programs have included formal tobacco cessation activities in their curriculum. The IUSD tobacco education and control program is closely linked with those at other schools.

Currently, tobacco-oriented, faculty-developed workshops are being routinely held at the annual ADEA meetings. For the past fifteen years, the Special Interest Group (Tobacco-Free Initiatives) has been meeting during the ADEA convention. As a result of these discussions, uninvolved dental schools have the opportunity to learn about tobacco education programs. Additionally, involved dental institutions can share their personalized approaches and learn new strategies from one another.

Several U.S. dental schools have established highly structured, individual, outpatient smoking cessation treatment programs utilizing NRT. They include Indiana University (since 1992), the University of Minnesota (1997), the University of Tennessee (1999), the University of Mississippi (1999), and the University of Alberta (2000). Other significant dental school tobacco education programs activated in the 1990s include those at the Baltimore College of Dental Surgery, the University of Missouri-Kansas City, the University of Michigan, Oregon Health Sciences University, and the University of Washington.

The Indiana University Nicotine Dependence Program

In October 1992, the IUSD five-member tobacco cessation team launched the Indiana University Nicotine Dependence Program (IUNDP), with the aid of Dr. Richard Hurt, M.D., director of the Mayo Clinic Nicotine Dependence Program. Three dental school faculty members served as counselors; their efforts were focused on helping hard-core tobacco users to quit. During the subsequent five years, about 350 patients were treated using this comprehensive approach. In April 1997, the Nicotine Dependence Program expanded its staff, scope of services, and treatment locations and became an interdisciplinary effort. During the past four years, an additional 200 persons have been treated. Currently, tobacco cessation patients are seen at the dental school, the Richard L. Roudebush Veterans Affairs Medical Center, and the Indiana University.
Cancer Center. The co-directors of the program are Dr. Christen and Stephen J. Jay, M.D. (pulmonologist and professor of medicine at the IU School of Medicine).

A new facility within the Cancer Pavilion is designed to offer tobacco cessation counseling to outpatients receiving treatment at all hospitals on the IU Medical Center campus. Additionally, individuals can be self-referred or sent by local health care providers. The center is also qualified to treat Medicaid recipients (who are frequently heavy smokers) and to work with patients from Methodist Hospital who need heart transplants (these individuals must demonstrate long-term smoking cessation before being accepted as transplant candidates). The program, which uses a multidisciplinary team approach, has the following key components:

- Biochemical monitoring at each session
- Diagnostic screening for nicotine dependence
- Spirometry to determine lung function
- Diagnostic consultations
- Personalized treatment planning
- Pharmacologic and individualized behavioral therapy
- Social and family support
- Short- and long-term follow-up, including quantifiable measurements
- Relapse prevention and management

In conducting long-term follow-up, we are able to determine the level of progress made by those smokers who have been unable to quit completely. Carbon monoxide testing is an accurate method of assessing complete or partial success. Although total cessation is our goal, harm reduction is a worthwhile, intermediate objective for some highly addicted smokers.46,47

Our program emphasizes both the short- and long-term benefits of tobacco cessation. As the CDC’s Best Practices has so succinctly stated:

Programs that successfully assist young and adult smokers in quitting can produce a quicker and probably larger short-term public health benefit than any other component of a comprehensive tobacco control program. Smokers who quit smoking before age 50 cut in half their risk of dying in the next 15 years. In addition, the cost savings from reduced tobacco use resulting from the implementation of moderately-priced, effective smoking cessation interventions would more than pay for these interventions within 3-4 years. One smoker successfully quitting reduces the anticipated medical costs associated with acute myocardial infarction and stroke by an estimated $47 in the first year and $853 during the next 7 years. Smoking cessation is more cost-effective than other commonly provided clinical preventive services, including mammography, colon cancer screening, PAP tests, treatment of mild to moderate hypertension, and treatment of high cholesterol.37

The IU Nicotine Dependence Program ranks among the most successful in the field; currently, the one-month quit rate is 58 percent, and the one-year quit rate is 33 percent.45 Our team is strongly committed to tobacco cessation education, both for health care professionals and for the general public. As part of their training routine, residents from the IU School of Medicine periodically observe our tobacco cessation and patient care efforts.

Our team members annually attend and participate in two leading national and international organizations working in tobacco control: the American Society of Addiction Medicine (ASAM) and the Society for Research on Nicotine and Tobacco (SRNT).*

Few CE courses offering tobacco cessation information and strategies are available for clinical dental practitioners. The Indiana University Schools of Medicine and Dentistry, Division of Continuing Education, and the Indiana University Nicotine Dependence Program together sponsor The Indiana University Workshop on State-of-the-Art Smoking Cessation Interventions. This endeavor, team-taught by a dentist, a pulmonologist, and a respiratory therapist, includes lectures, case presentations, and hands-on skill building. Participants are instructed on how to assess, diagnose, and develop treatment plans and optimally deliver effective tobacco cessation inter-

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* The official journal of SRNT, Nicotine and Tobacco Research, is one of the few peer-reviewed publications devoted exclusively to this topic. Published quarterly since March 1999, it provides a forum for empirical findings, critical reviews, and conceptual papers on the many aspects of nicotine and tobacco usage. Another significant publication, Tobacco Control: An International Journal, focuses on all aspects of tobacco prevention and control, especially concentrating on political aspects of tobacco use worldwide. These prestigious journals provide our team with the latest information about various aspects of tobacco use and nicotine ingestion.
ventions. This one-day course, accepted by the Indiana State Board of Dental Examiners, is worth eight C.E. credit hours.45

REFERENCES