

Prevention of Tobacco-Caused Disease

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Overview

The reduction of tobacco-caused disease is a highly desirable goal for physicians. In 1986 the Canadian Task Force on the Periodic Health Examination recommended counselling for smoking cessation (A Recommendation). This chapter provides an update of evidence on strategies to achieve smoking reduction, again focusing on physician interventions. Smoking among pregnant women is addressed in a separate chapter (see Chapter 3).

Smoking cessation assistance (including nicotine replacement therapy) has been shown to be effective and is recommended. Reducing the number of young people who start smoking is critical but has been less intensively studied. Counselling to prevent smoking initiation is recommended (B Recommendation). There is also evidence to support referrals to other programs after giving cessation advice but insufficient evidence to evaluate counselling to reduce environmental tobacco smoke (ETS). Given the magnitude of the problem, educational programs, counselling and healthy public policies are all vital.

Burden of Suffering

Trends in Smoking

The use of tobacco in Canada has declined gradually since 1965. A November 1992 survey found that 28% of Canadians over the age of 18 were smokers.<1> It is estimated that roughly 6,700 Canadian adolescents start smoking every month.<2> The average age for starting to smoke has been reported to be 11-13 years. A 1986 survey found that 94% of smokers first tried smoking before age 17. The percentage of teenagers aged 15-19 years who smoke regularly (16%) has been cut to about a third of the rate that existed in the late 1970s (47% in 1979). In 1991, there were more regular female (20%) than male (12%) smokers in this age group.

The 1991 survey results from Statistics Canada<3> indicated for the first time that the number of regular female smokers was greater than the number of males. The historically higher prevalence of smoking among men is no longer evident. Among women the overall decline in prevalence has been slight from 28% in 1966 to 26% in 1991.

The 1986 Labour Force Survey found that smoking ranged from 18% among professional workers to over 40% among transportation workers and miners. Armed Forces personnel have also been identified as a high risk group; a 1992 study found 53% of junior navy personnel smoked.

By ethnic origin, the highest smoking rates in Canada are found among Canadian Native peoples (59% regular smokers in 1990). In addition to high smoking rates among Native children (51-71%), the high prevalence of use of smokeless tobacco has also been identified as a concern for Native children and other adolescents.

While data on exposure to environmental tobacco smoke (ETS) are limited, a 1991 survey found that 44% of the Canadian work force is exposed to second-hand smoke at work. Such exposure was inversely related to occupational status. Fifty-four percent of Canadian children live in households with at least one smoker, and they are twice as likely to be regular smokers as those who do not live with a

smoker.<4>

Health Effects of Smoking

A large body of evidence has accumulated regarding the health effects of smoking. Tobacco use has been consistently linked with a variety of serious pulmonary, cardiovascular and neoplastic diseases. Evaluation of this evidence is beyond the scope of this chapter but detailed reviews<5-7> and estimates of relative risk for the many tobacco associated diseases<8> have been published elsewhere. Likewise, reviews of the evidence regarding the health consequences of ETS are published elsewhere.<9> In 1992 the U.S. Environmental Protection Agency (EPA) named ETS a Group A carcinogen (shown to cause cancer in humans) at typical environmental levels.<10>

Parental smoking is associated with smoking initiation by adolescents.<4> Exposure to smokers in the home may be the single most important factor in determining whether a teenager will smoke. Assistance which physicians provide for adult smokers to quit may have a powerful effect on children in the home.

It has been estimated that there were over 38,000 smoking-attributable deaths in 1989, or 20% of all the deaths in Canada.<8> This resulted in 271,497 potential years of life lost before 75 years of age. The decline in smoking prevalence has played a major role in the reduction of mortality from cardiovascular disease, as well as in projected declines in mortality from lung cancer and chronic obstructive pulmonary disease (COPD).

Health Effects of Smoking Cessation

In his 1990 report, *The Health Benefits of Smoking Cessation*,<11> the U.S. Surgeon General concluded that smoking cessation was highly beneficial. The health benefits of smoking cessation far exceeded any risks from the average 2.3 kg weight gain or any adverse psychological effects that followed quitting.

Tobacco is highly addictive.<12> Over 75% of adult smokers would like to stop and at least 60% have tried to quit at some time in their lives. Approximately one-third of smokers attempt to quit every year. About 20% reported quitting on the first attempt, while 50% succeeded after 6 tries.

In 1986, about 90% of successful quitters and 80% of unsuccessful quitters used individual methods of smoking cessation rather than organized programs; most of these smokers used a "cold turkey" approach. Research on self-help/minimal intervention strategies is ongoing.

Maneuver

Smoking Prevention Counselling

With adolescents, the most effective strategy to discourage smoking may be to concentrate on immediate issues, such as reduced athletic ability, cost, odours and poor appearance.<13> Teenagers can be shown that tobacco advertising falsely suggests that the majority smokes, and that smoking makes one sophisticated and attractive.<14>

Smoking Cessation Counselling and Community Action

The Canadian Consensus on Physician Intervention in Smoking Cessation<15> provides a guide on counselling strategies. While 85-94% of physicians have reported that they discuss smoking or tell most or all smoking patients to quit, U.S. surveys suggest that 43-50% of patients have never been advised to smoke less or to quit by a physician. A small study in Vermont found that only 40% of pediatricians routinely took a smoking history from parents. A 1989 study found that 91% of pediatricians in Maine advised parents who smoke to quit.

Physicians can also refer patients to smoking cessation programs; an inventory of self-help and group programs has recently been published.<16> Health care professionals can also promote non-smoking through a range of consulting and advocacy activities in health care settings as well as through communities, school boards, worksites, governmental agencies, legislatures and the media.

Effectiveness of Prevention

Prevention of Smoking Initiation

Since the 1960s, when tobacco was proven to be the cause of the majority of cases of lung cancer,<5> there have been formal educational programs in schools about the dangers of tobacco use. These programs have been effective in teaching children that tobacco use causes disease<17> but effectiveness in preventing smoking initiation has not been striking to date.<18> The 1994 Report of the U.S. Surgeon General found that in a variety of research studies (including several randomized trials and 4 meta-analyses) social influence programs for students decreased prevalence of smoking by 25 to 60%.<19> The difference persisted from 1 to 4 years. The report concluded that tobacco-use prevention programs that target the larger social environment of adolescents are both efficacious and warranted.

A 4-year cohort study<20> of Peer Assisted Learning (PAL) in Calgary grade 6 students found that the program prevented or delayed smoking initiation in 15% of males ($p < .05$). Its efficacy with females was negligible and the effect on prevention of regular as opposed to experimental smoking was unclear.

The educational programs which seem to show maximal effectiveness are those which emphasize the positive aspects of being smoke-free and promote self-esteem.<21> However, researchers have questioned whether educational programs on their own will ever lead to dramatic reductions in smoking initiation.<22>

When 12 to 17 year old smokers in Nova Scotia<23> were asked who should teach them about the effects of smoking on health, the option chosen by 23% was their family doctor. Also, 19% claimed that they would quit if their doctor so advised them. Several authors have suggested that the physician is strategically placed to advise young people effectively (expert opinion).<24>

The potential benefits in terms of prevention of addiction, the burden of morbidity and mortality for smokers and the effectiveness of counselling with regards to cessation (see below), provide further justification for counselling to prevent smoking initiation among children.

Smoking Cessation

In a 1988 meta-analysis of 39 smoking cessation trials, it was found that cessation rates for unselected patients who receive a clinical intervention average about 6% higher than for control patients after one year.<25> The most effective techniques were those involving more than one modality, that involved both physicians and non-physicians, and that provided the greatest number of motivational messages for the longest period of time.

Nicotine replacement therapy has been found to be useful in many studies. The best results with nicotine chewing gum have been obtained with multi-component programs which have included some counselling and ongoing follow-up and support. In a 1987 meta-analysis by Lam and colleagues,<26> nicotine gum was superior to placebo gum in specialized cessation clinics (1-year abstinence rates of 23% versus 13%). Although nicotine gum was similar to placebo gum in general medical practice (11.4 versus 11.7%), nicotine gum was superior to the no gum control group (9% versus 5%).

Transdermal nicotine patches have been shown to improve 1-year cessation rates by 5-13%, in

randomized controlled trials in comparison with placebo patches.<27-29> For the 24-hr patch, systemic side effects and/or withdrawal symptoms were reported in 32% of patch users as opposed to 24% of placebo patch users.<30> Local skin problems were reported by 14-50% of patch users and 0-13% of placebo patch users. Trials involving the 16-hour patch also suggest they may have fewer systemic side effects and local skin problems.<28> A 1994 meta-analysis of randomized controlled trials of nicotine replacement therapies including gum, patches, inhalers and nasal spray, found an overall odds ratio for abstinence with the use of nicotine adjuvants of 1.71 (95% confidence interval (CI): 1.56-1.87).<31> In a second meta-analysis of randomized trials of gum and patches,<32> nicotine 2 mg chewing gum had an overall efficacy of 6% (95% CI: 4%-8%), greater in self-referred subjects (responding to advertisements or attending anti-smoking clinics) than in invited (general practice or hospital patients) subjects (11% versus 3%). Efficacy was found to depend on the extent of dependence on nicotine as assessed by a simple questionnaire – the Fagerström test). It was 16% (7-25%) in "high dependence" smokers, but in "low dependence" smokers there was no significant effect. The 4 mg gum was effective in about 1/3 of "high dependence" smokers and appeared to be the most effective form of replacement therapy for this group. The efficacy of the nicotine patch (9% (6-13%) overall) was less strongly related to nicotine dependence, perhaps because the patch cannot deliver a bolus of nicotine to satisfy craving. While comparable in efficacy to other replacement therapies, the patch offers greater convenience and minimal need for instruction in its use. Other adjuncts to cessation therapy are available, but have undergone less thorough evaluation.

An intensive specific referral to a group smoking cessation program (counselling, videotape with testimonials and telephone call 1 week after referral) has also been shown to increase participation by patients in such programs (from 0.006% for those offered general advice to 11% for the intervention group in a study of 1380 smokers).<33> The authors recommend a brief office-based intervention preceding referral since most patients will not attend a group program.

Efforts to increase physician counselling have had some success. In randomized controlled trials, training, office systems and staff support have been shown to change physician behaviour<34> and doubling of quit rates among patients of physicians who had received training versus "control physicians" has been reported.<35> However, some trials have shown no statistically significant effect on quit rates although training may have had a small beneficial effect.<34,36> A randomized trial involving family physicians from the Hamilton, Ontario area found that 4 additional follow-up visits did not significantly improve cessation rates at 1 year (12.5% versus 10.2%).

While improving the cessation counselling offered by physicians has had mixed results, the evidence in support of counselling is clear. There is good evidence, based on multiple randomized controlled trials, to support cessation counselling and nicotine replacement therapy. Cessation interventions vary considerably in their effectiveness and many of the adjuncts to cessation counselling require further evaluation.

Counselling to Prevent ETS Exposure

A study<37> of a low-intensity physician's office-based strategy (telephone call and letter suggesting changes in household smoking behaviour not including cessation) aimed at reducing infant exposure to ETS was not effective in a study of 103 mother-infant pairs in which the mother smoked 10 or more cigarettes/day. However, the study sample size and drop-out rate was such that a small effect (less than 10% difference in cotinine measurements) could not be identified. Preschool education programs have been shown to create the intent to avoid second hand smoke in children,<38> but no other evidence evaluating the effect of such advice was identified. However, given the burden of suffering and the effectiveness of other counselling, it may be useful to combine counselling to avoid ETS exposure with cessation advice.

Community Action

Physicians have the potential to be highly influential community leaders on issues affecting health. An extensive review of smoking prevention programs concluded that adolescents will only change their behaviour if those changes are consistent with social norms.<39> Interventions must strive to make smoking widely perceived as "deviant behaviour".

Tobacco advertising and sponsorship make smoking appear acceptable and desirable. In countries where advertising has been banned or severely restricted, childhood smoking has declined.<40> In Canada, since the introduction of the Tobacco Products Control Act, overall consumption has declined by 17.1%. Smoking among youths aged 15-19 years has declined from 22.5% in 1986 to 16% in 1991.

There is strong evidence that the simplest approach to discouraging smoking initiation by adolescents is to keep the price out of reach. Investigators have found that price increases of the order of 10% lead to short-term reduction of teenage consumption by 14%.<41,42> Recent tobacco tax cuts, unfortunately may help to sustain the tobacco problem in Canada.

Other important strategies include reducing child access to tobacco through effective tobacco retailing restrictions,<43> and bans on smoking in public places. Physician activities as community leaders can have dramatic effects in this area.<44>

Recommendations of Others

The U.S. Preventive Services Task Force<45> recommends that tobacco cessation counselling be offered on a regular basis to all patients who use tobacco. The prescription of nicotine gum is thought of as an appropriate adjunct for some patients. They also recommend that adolescents and young adults who do not currently use tobacco products be advised not to start. Other medical organizations and agencies are consistent in their support of tobacco control measures.

Conclusions and Recommendations

There is good evidence to support counselling for smoking cessation in the periodic health examination of individuals who smoke (A Recommendation). Nicotine replacement therapy can be effective as an adjunct (A Recommendation).

There is fair evidence to support physicians also referring patients to other programs after offering cessation advice (B Recommendation).

There is fair evidence to support counselling to prevent smoking initiation for adolescents (B Recommendation). Educational programs have not been shown to significantly reduce tobacco initiation. Counselling by physicians has not been evaluated but given the burden of disease, the benefits of preventing addiction, the effectiveness of other smoking-related counselling and the support of expert opinion, all children and adolescents should be counselled on avoiding tobacco use.

There is insufficient evidence to evaluate counselling to reduce ETS exposure (C Recommendation) but it may be useful to combine such counselling with cessation advice, again based on the burden of suffering, the potential benefits of the intervention and the effectiveness of cessation advice.

Unanswered Questions (Research Agenda)

Research is needed into effective strategies to prevent teenage smoking initiation, specifically those which physicians can employ. The impact of tobacco industry sponsorship of sports and cultural events on tobacco initiation needs to be addressed.

Evidence

The evidence which forms the basis of this review was gathered from the collections of the authors and also identified using a MEDLINE search for 1988 to August 1993 using the key words: smoking and prevention, smoking cessation, tobacco, clinical trial or meta-analysis, Canada and physician.

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