CA Ramseier
A Fundak

Tobacco use cessation provided by dental hygienists

Authors' affiliations:
Christoph A. Ramseier, Department of Periodontology, School of Dental Medicine, University of Berne, Berne, Switzerland
Angela Fundak, Sorella Communications, Prahran, Vic., Australia

Correspondence to:
Christoph A. Ramseier
Dr Med. Dent., Periodontist SSO, EFP
Master of Advanced Studies in Periodontology (MAS)
Assistant Professor
Department of Periodontology
School of Dental Medicine
University of Berne
Freiburgstrasse 7
3012 Bern
Switzerland
Tel.: +41 31 632 2589/2540 (direct)
Fax: +41 31 632 4915
E-mail: christoph.ramseier@zmk.unibe.ch

Dates:
Accepted 25 August 2008

To cite this article:
Int J Dent Hygiene **7**, 2009; 39–48
Ramseier CA, Fundak A. Tobacco use cessation provided by dental hygienists.

Abstract: Second to regular mechanical plaque control, tobacco use cessation has become the most important measure for the treatment of periodontal diseases. In contrast to general medical professionals, dental hygienists are seeing their patients regularly and are therefore available for supporting their patients to quit tobacco use. Tobacco use disease consists of both a physical addiction and a psychological dependence. Therefore, the combination of behaviour change support with pharmacotherapy is recommended for tobacco use cessation counselling. The use of brief motivational interviewing for tobacco use short interventions in the dental practice appears to be suitable. In addition to behavioural support, the use for nicotine replacement therapy is the treatment of choice for the dental practice. Following a critical review of the literature on this topic, a step by step approach for tobacco use cessation is presented for the dental hygienists to be implemented in their daily practice routine.

Key words: behaviour support; motivational interviewing; nicotine replacement therapy; tobacco use cessation

Introduction

Numerous scientific studies in oral health research over the past few years have plainly demonstrated the detrimental effects of tobacco use on both oral mucosa and periodontal tissues. For periodontal care, both improving oral hygiene and tobacco use cessation have been identified as necessary measures to gain and maintain long-term periodontal health (1, 2). This evidence has given the dental team a whole new task to manage when achieving and maintaining oral health with their patients.

The measures carried out to improve the patients' oral hygiene or to support their attempt to quit tobacco use are often

assigned to dental hygienists and identified in treatment plans as patient 'motivation' or 'education'. Improvements of oral hygiene and periodontal stability due to long-term supportive periodontal therapy have been well studied and presented in the literature (3). For tobacco use cessation, however, there are yet limited outcomes following standard protocols for dental hygienists who want to predictably enable their patient to quit (4, 5). Therefore, it is timely to critically review current applications and to propose suitable new approaches both adapted for the dental practice and based on the best available evidence in health behaviour change to enhance the opportunity for a better success as dental professionals today globally increase the promotion of tobacco use cessation with their patients.

Understanding 'tobacco use disease'

In order to support dental patients to quit tobacco use, it is helpful for the clinician to have an understanding of the genesis of 'tobacco use disease' in general. The term 'tobacco use disease' refers to the condition of tobacco users suffering from both physical nicotine addiction and psychological tobacco use dependence.

Physical nicotine addiction

Tobacco products contain the drug nicotine which is known to create a pleasant emotional state in tobacco users. In smokers, nicotine from tobacco smoke passes through the lungs or the oral mucosa into the blood circulation, which then transports the molecule to the central nervous system. At this location, nicotine attracts receptors for acetylcholine and prolongs the opening time of the ion channels for the flow of sodium into the target cells (6). As a result of this additional flow, the concentration of noradrenaline will be raised temporarily in certain areas of the brain, such as the nucleus accumbens and the locus ceruleus, leading to an emotional delight to the consumer (7, 8). Simultaneously, however, an adaptation will be triggered over time to decrease the sensitivity of the nervous cells to the same stimulus (9). As a consequence of this adaptation, the tobacco user will increase the nicotine dose (i.e. number of cigarettes per day) in order to experience the same enjoyment from tobacco consumption. Finally, experiences of withdrawal symptoms occur in case the brain cells will not receive the nicotine dose they demand. Once adaptation has proceeded, the tobacco user even requires a minimal dose of nicotine in order to prevent withdrawal symptoms from reoccurring. This process of adaptation by the central nervous system is referred to as the development of the physical nicotine addiction (10).

Psychological tobacco use dependence

In addition to the physical addiction described above, the repeated use of tobacco products can lead to the development of a habit itself. Social contacts to other consumers, altogether with recurring daily repetition, can enhance the development of a consumption habit. Over time, this habit can become part of a person's daily routine. Consequently, if the behaviour cannot be carried out for a certain reason, the person experiences symptoms such as restlessness, nervousness or aggression. These reactions are caused by the psychological dependence.

Tobacco use disease, again, consists of the physical nicotine addiction and the psychological dependence. In order to be predictably successful, any approach to support tobacco use cessation should include both pharmacotherapy to treat the physical symptoms of withdrawal and behavioural support to address the psychological component of the dependence.

Tobacco use cessation

During everyday life, tobacco consumers receive feedback from many quarters concerning their unhealthy behaviour. Numerous articles or programmes in the media, 'No Smoking' signs at the workplace and in public areas, the strongly expressed wish of friends and family members not to be exposed to the risks of passive smoking: these are only a few of the situations smokers have to contend with on a regular basis. Furthermore, efforts are made to reduce the prevalence of tobacco use by raising taxes on tobacco products and limiting advertising by the tobacco industry. The support of doctors and dentists is enlisted for these efforts, which are mounted, among other reasons, in the interest of public health. Although all these measures taken at the initiative of the public health sector are generally acknowledged, in the final analysis it will always be the consumers who decide whether they are willing to change behaviour and terminate their tobacco consumption. Among smokers who try to 'kick the habit' without support from either professional counselling or self-help groups, the success rate is found to be between 10.2% and 11% (11).

Methods for tobacco use cessation

At present, the evidence-based method for tobacco use cessation consists of professional counselling on behavioural change using the so called '5A Method' (Ask, Advise, Assess, Assist

and Arrange) in combination with pharmacotherapy (11). It is well known that the success rates achieved by smoking cessation counselling are generally dependent on the amount of time allowed for this counselling. The success rates achieved by counselling lasting for 1–3, 4–30, 31–90 and >90 min are 14.0%, 18.8%, 26.5% and 28.4%, respectively (11). In clinical studies designed to record the success rates achieved by smoking cessation programmes, it was observed that the percentage of participants who were still abstinent was relatively high (>50%) around 3 months after quitting. However, this statistic drops dramatically by the end of the first year (<25%) following the quit date as a result of the generally high relapse rate (12, 13).

Other well-known methods of smoking cessation, such as acupuncture or hypnosis, have been investigated repeatedly. In meta-analyses of several controlled studies, however, Fiore *et al.* (11) reported that the success rates of these methods were not to be compared with the '5A Method'. Furthermore, the method described in the books 'The Easy Way to Stop Smoking' and 'The Only Way to Stop Smoking Permanently' written by the former heavy smoker and author Allen Carr (1934–2006) was never tested in controlled trials. Although individual reports attest to the success of these methods, they cannot be generally recommended without the necessary scientific evidence.

Readiness to accomplish behaviour change

The readiness to accomplish behaviour change is often described by the so-called trans-theoretical model, according to which a person trying to change his or her behaviour passes four different stages: precontemplation (lack of awareness), contemplation (gaining of awareness), preparation (getting ready) and action (implementation) (14).

A suitable model for behavioural support in tobacco use cessation would help patients to move from one stage to the next. However, when asked about their readiness to quit smoking, tobacco users frequently respond that they want to quit 'sometime' but that this time has not come yet: there would be certain things to be accomplish first, such as to take a final exam or to recover from an emotional trauma. In many cases, smokers have learned or created these excuses to continuously justify their tobacco consumption. Behind this attitude, however, there may be the fear of failure to quit, an unpleasant memory of a failed past attempt, or a concern about gaining weight. During the process of skilful counselling, excuses of this kind can be identified in a non-offensive way. Possibly, the counsellor will be able to touch on them without triggering resistance on the part of the smoker.

Fear to relapse

The fear to relapse is a considerable issue in tobacco use cessation counselling. Many smokers have a significant concern to fail quitting and they often lack self-confidence. Former smokers frequently report that they successfully quit because they 'believed in themselves' and 'believed they would make it'. It was this belief, many say, which was the key to their success. Through appropriate counselling, self-confidence can be strengthened, and readiness to quit may be increased. Furthermore, nicotine dependency should be put into perspective: the possible failure to quite smoking should not be interpreted as a weakness, but rather as a function of high nicotine dependency.

Fear to gain weight

The concern to gain weight after quitting smoking is a second important issue. In a clinical trial performed in the USA with 5887 smokers aged 35–60 years, an average weight gain of 9.7 kg was recorded over a period of 5 years which is significantly higher than the 5.3 kg generally estimated amount of gain in non-smokers during the same period (15).

As the body's metabolism in smokers is increased by regular tobacco consumption, smokers generally burn up more calories. Conversely, nicotine withdrawal is shown to lower metabolism. Following nicotine withdrawal, therefore, the energy will be stored as body weight even if the individual stays on the same diet. It may be appropriate for the counsellor at this point to mention that pharmacotherapy, e.g. the administration of nicotine substitutes, may lessen weight gain effectively (16).

Success rates of smoking cessation programmes carried out in dental practices

The success rates of smoking cessation programmes carried out in dental practices have been summarized in the popular literature review by Warnakulasuriya (17). As in other clinical studies dealing with professional counselling on smoking cessation offered by doctors and psychotherapists, a high short-term success rate was recorded for the counselling by dentists. In the early 1980s Christen *et al.* (18) reported a success rate of 34.3% (recorded 6 weeks following the quit date) for a smoking cessation programme involving counselling and nicotine substitution. Fifteen weeks following the quit date, however, these figures dropped to 12.4%. The success rates recorded for the combination of counselling and nicotine placebo were 10.7% and 4.8% at 6 and 15 weeks, respectively, after the quit date.

The success rates of a smoking cessation programme carried out in dental practices were evaluated by Cooper and Clayton (19) in the 1980s in a group of 374 smokers. The success rates of programmes without pharmacologic support were 7.7–8.6% 1 year after the participants had quit smoking. With cessation programmes including nicotine substitution, success rates of 16.3–16.9% were achieved. The success rates attained by smoking cessation counselling provided by dental hygienists without the support of nicotine substitute products was 2.4–2.6% 1 year after the participants had quit smoking (20).

The success rates achieved by smoking cessation programmes offered by dental practices are summarized in a recently published systematic survey article. The pooled results for the total of seven studies showed that the counselling of smokers and users of chewing tobacco by dental personnel significantly increased the tobacco abstinence rates (odds ratio; 1.44; confidence interval: 1.16–1.78) (21).

Barriers to be overcome by the dental team

We know that most tobacco users are aware of their unhealthy habit. A closer look at the questions of what types of health problems caused by tobacco are generally known, however, reveals that the detrimental effects of tobacco use on the oral mucosa and the periodontium are still substantially underestimated (22). In the interest of public health, therefore, the dental practice team has to perform an important task – namely, mentioning and discussing the consequences of tobacco use on oral health with all their patients – in addition to assessing their oral hygiene. It is not always easy to integrate this kind of patient briefing into the everyday work of a dental practice. As mentioned above, additionally, a number of tobacco users feel as they remain under social pressure to quit tobacco. Moreover, many patients have visited their dentists on numerous occasions in recent years without members from the dental team addressing the topic of tobacco use, mentioning the consequences for oral health, and assessing the patient's willingness to quit. As a consequence, however, of the scientific knowledge attained over the past 5–10 years, the dental practice team was yet assigned an active role in promoting smoking prevention and cessation among their patients.

Reported barriers and obstacles to integrating smoking cessation programmes into the daily routine of the dental practice may be listed as: (1) too little time, (2) financial considerations, (3) lack of interest on the part of the patients, (4) respect for the freedom of the individual, (5) too little experience in 'giving good advice' and (6) fear of losing patients (4, 23). In the future these barriers ought to be overcome via appropriate training of dental personnel (24–26).

Suitable approaches for the dental hygienists

At the first European Workshop on Tobacco Prevention and Cessation for Oral Health Professionals, which was held in Switzerland in the fall of 2005, a version of the evidence-based '5A Method' was adapted for the specific requirements of the dental practice (24).

In contrast to general medical practitioners, dental hygienists see their patients regularly. For this reason, the dental practice is a suitable setting to motivate their patients to quit tobacco use. Next to the dental hygienist, however, it has to be acknowledged that every member of the dental practice team can take part in the team effort to promote smoking cessation. By means of coordination, the individual team members can greet patients professionally, address their tobacco use regularly, and offer front-to-back support with a structured tobacco use cessation programme (see below). Dental assistants and other dental practice staff can support their team by doing administrative work such as setting up information on smoking cessation in the waiting room area, administering the tobacco use history forms, or systematically labelling patient files (27, 28). At the website http://www.dental-education.ch/smoking, modifiable administrative materials designed for use in the dental practice can be downloaded in four languages free of charge.

Tobacco use short intervention 'Ask' and 'Advise'

Ask

It is well recognized that the medical history form plays a critical role in developing an oral healthcare plan that is cognisant of the general health status. The inclusion of the patients' tobacco use history (Fig. 1) is shown to be a vital component of the medical history form on a myriad of levels that are integral to the promotion of tobacco use prevention and cessation. For example, if the patient identifies as a never smoker, it enables the oral health professional to reinforce the benefits of this lifestyle choice. Particularly in the case of young adults, the opportunity to congratulate their decision to remain tobacco free offers a positive counter to the efforts of peer pressure, advertising or other adverse influence. Should the patient identify as a former smoker, the opportunity arises again to provide positive reinforcement to the decision to

Tobacco use history

Last / first name: _____ Date: _____

1. Have you ever smoked more than 200 cigarettes?	☐ Yes ☐ No (go on with question 6)
2. At which age have you started to smoke regularly?	With _____ years
3. Are you currently smoking cigarettes?	☐ Yes, (go on with question 5) ☐ No
4. In which year have you quit smoking?	_____
5. How many cigarettes are you smoking per day?	_____
6. Have you used other tobacco products regularly?	☐ No (go on with question 8) ☐ Yes, the following: **Cigar** ☐ Never ☐ In the past ☐ Now **Pipe** ☐ Never ☐ In the past ☐ Now **Chewing tobacco** ☐ Never ☐ In the past ☐ Now **Other** ☐ Never ☐ In the past ☐ Now
7. How often have you already tried quitting tobacco use?	☐ Never ☐ Once ☐ 2 – 4 times ☐ More than _____ times
8. Are you currently thinking of quitting tobacco use?	☐ No ☐ Yes, within the next _____ months
9. Personal information **a. Age** **b. Sex**	Date of birth: _____ ☐ Female ☐ Male

Fig. 1. Tobacco use history form. This form is available for download at http://www.dental-education.ch/smoking/downloads.

change. The implementation of a tobacco use history form additionally increases the awareness to the patient regarding the detrimental effects of tobacco on oral health. Finally, the tobacco use history form allows a non-threatening introduction to the ensuing conversation between oral health professional and patient.

Advise

The oral health professional has an ethical and medico-legal responsibility to inform the patient of the consequences of ongoing tobacco use and the benefits of cessation. In fact, dental patients say they would expect advice and support from their oral health professional if they chose to quit using tobacco (29). This advice also needs to be well documented in the patients' record to indemnify any possible litigation action. The recording of this information in the patients' record may also reflect their movement along the 'Readiness Rule' (30) during the course of dental hygiene appointments. When asked about their readiness to quit smoking, tobacco users often reply that they want to quit smoking 'sometime' but that the time is not yet right. There are certain things they need to do first, which are seen as more important than giving up smoking. Even if the patient feels that they are ready to quit smoking, there still may be some uncertainty about the next steps. They may experience a lack confidence to achieve this goal (I just do not have the willpower) and feel under prepared to make a quit attempt. Behind this attitude is often the fear of failure, potential change to social habits, or worry about gaining unwanted weight. Understanding the current levels of recognized importance and confidence as indicators of the readiness to change (Fig. 2) can greatly assist the process of supporting the patient through a quit attempt. For example, asking the patient to use a number scale to rate how important it is to them to quit smoking will give a direction for the oral health professional to follow. Using the same number scale to

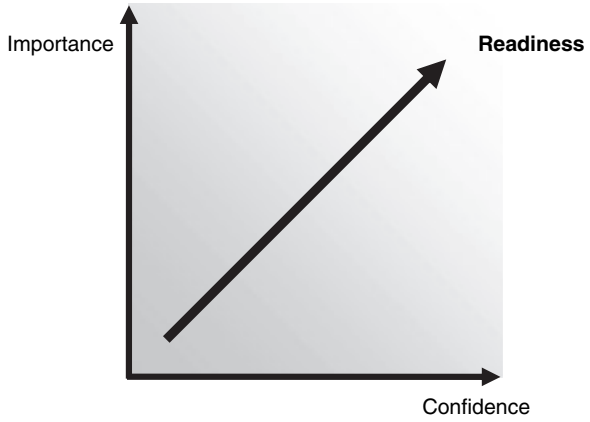

Fig. 2. Increasing importance and confidence elevates readiness to change. Adapted by Rollnick *et al.* (31).

rate how confident they are in achieving this goal will further direct the conversation towards identifying the type of support the patient may need (31).

(Brief) motivational interviewing

Numerous behavioural studies have demonstrated predictable success in supporting patients to change using motivational interviewing (MI). MI is a patient-centred method to enhance the patient's intrinsic motivation to change by exploring and resolving ambivalence (32). A 'short form' of MI known as 'brief motivational interviewing' (BMI) appears to be suitable for use during short interventions for tobacco use prevention and cessation in dental practices (31). The aim of BMI is to achieve the following objectives within a relative short amount of time: (1) to ask the patient about his or her motivation to change, (2) to increase the patient's self-confidence to change and (3) to get the patient's commitment to discuss the change in behaviour at the next visit.

DH: So Paul, I understand from the information you have given us that you have been smoking for about a year now. How do you feel about your smoking and the part it plays in your life?

P: Well… I know it is not good for me and I really should quit. But it is hard to quit at the moment as my wife and I are building our new house – it is quite stressful.

DH: You are right Paul; many people find that giving up smoking can be tough. You mentioned that life is stressful at the moment with the new house being built – how does smoking fit into this situation?

P: Smoking helps me to relax when it all gets too much! I can just walk away, have a smoke and forget about it for a while.

DH: So your smoking gives you a chance to have a break from the source of stress.

P: Yes it does although it is probably not doing my lungs any good!

DH: What other things could you do to remove yourself from the situation for a few minutes?

P: Mmmm… well there is parkland near where our house is being built. I could go for a lap around the park to clear my mind I guess.

DH: Would this be easy to do?

P: Sure, I could try getting into that routine instead of always reaching for my cigarettes.

DH: Okay then! Let me see if I have understood all that we have discussed so far. We know that for the past year as your house planning and building has taken shape, life has been pretty stressful. You have found that smoking helps you to get away from the stress even though you feel it is not a healthy habit. You mentioned that you could take a walk around the park that is nearby to the house site instead of smoking. Is there anything I have missed?

P: No, that's about it. I will try to get out and walk rather than smoke when I need a break.

DH: That's good to hear. How do you feel about reviewing this at your next appointment?

P: That's fine – it will keep me honest!

This example keeps the channels of communication open between the oral health professional and the patient. The conversational pathway has been led by the patient with the oral health professional using skilful selection to identify the opportunity for promoting tobacco use cessation.

So far, few data are available which could serve as the basis for evaluating this counselling method. In a clinical trial involving 200 smokers receiving medical care from general practitioners, a comparison of MI and a short counselling interview showed that five times higher rates of smoking cessation were achieved by the former than by the latter (18.4% versus 3.4%) (33). The effectiveness of MI and BMI as tools for nicotine withdrawal programmes in dental practices needs to be explored in further studies.

Tobacco use cessation 'Assist' and 'Arrange'

Providing assistance for the patient who wants to quit using tobacco often requires a combination of behavioural

modification techniques and pharmacological support. Making arrangements for ongoing support either via the dental office or other health agencies provides the patient with a valuable sense of reassurance as they undertake a quit attempt.

Step-by-step protocol

People who want to kick the smoking habit do not always participate in carefully controlled nicotine withdrawal programmes, i.e. in linear fashion and from start to finish. Nevertheless, simple instructions – like those offered in the 'Assist' (to help) and 'Arrange' (to organize follow-up visits) – can be valuable tools for dental hygienists supporting their patients to quit smoking.

Some smokers may even be euphoric about quitting smoking that would therefore tend to quit in a premature – i.e. unprepared – manner. Even if this approach works for some smokers (34), others require varying amounts of support (11, 14). This support can be given in an individual way manner by adapting the four steps outlined in the following:

Session 1: Ask the patient to fill in the tobacco use journal

Every smoker has his or her individual smoking habits. To pinpoint the behavioural changes required in each particular case, it is recommended to fill in a tobacco use journal (Fig. 3) for several days. The patient will be instructed to fill in every column in the journal.

- Instructions for the period up to the patient's next appointment: Fill in each cigarette and the time it is smoked; again, be sure to fill in all four columns of the journal labelled as 'Time', 'Place or activity', 'Companion', 'Importance' and 'Alternative'.

Session 2: Evaluate the tobacco use journal

Reading through the journal entries at the follow-up appointment may reveal patterns of smoking and assessments of importance which may not have been aware to the patient. This information will serve as the basis for re-assigning new habits for the patient in order to give up smoking (ideally without withdrawal symptoms) and to replace the old habit with new patterns of behaviour. During this period, the patient will be advised to reduce tobacco use to a bearable minimum.

The four columns of the journal (Fig. 3) contain information on four important elements of the cessation protocol:

- 'Time': Patients who smoke regularly throughout the day are primarily advised to alleviate the physical symptoms of withdrawal with sustained-release nicotine patches. On the other hand, patients who only smoke at certain times throughout the day are generally advised to use nicotine gum, sublingual tablets or lozenges. The smoking behaviour that has been evaluated can be entered later in the form labelled 'Recommendations for Use of Nicotine Replacement Therapy' (see below).

Tobacco use journal

Date: _____

Cig.	Time	Place or activity	Companion	Importance	Alternative
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Date: _____

Cig.	Time	Place or activity	Companion	Importance	Alternative
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Fig. 3. Tobacco use journal. This form is available for download at http://www.dental-education.ch/smoking/downloads.

- 'Place or Activity' and 'Companion': Instructions for the period up to the patient's next appointment: Attempt to change situations. Example: Spend your work break with different colleagues and at a different location than usual.
- 'Importance': Instructions for the period up to the patient's next appointment: Try to reduce the number of 'less important' cigarettes.
- 'Alternative': Instructions for the period up to the patient's next appointment: The patient should try to find his or her own personal alternatives – so-called replacements – which could help them to resist. In this context, they should take care to alternatively distract their mind (mental), their hands (physical) and their mouths (oral). Examples: Play a game that requires mental concentration or manual dexterity. Do not select alternatives that simulate smoking. Example: chewing on a stick of liquorice.

Session 3: Behavioural changes and nicotine dependence

The process of successfully replacing smoking habits with other activities can be difficult and time-consuming. Each patient should identify replacements (see above) that contain a personal reward. It might be wise to schedule and arrange additional consultation time as this point so that enough emphasis can be devoted to this important step.

- Note the replacements identified.
- Determine the degree of nicotine dependence: This can be assessed easily by asking the following questions (Table 1):

  1 How many cigarettes do you smoke a day?

  2 How many minutes after waking-up in the morning do you smoke your first cigarette?

On the basis of the answers to these questions, the patients can be divided into four groups: extremely dependent, very dependent, moderately dependent and slightly dependent. N.B.: The answer showing the greatest dependency indicates the overall dependency (35).

- Set the quit date.

Table 1. **Nicotine dependence test adapted by Fagerstrom (35)**

Have you already attempted to give up smoking?	How many cigarettes do you smoke per day?	How long after waking up in the morning do you smoke your first cigarette? (minutes)	Level of dependence
Yes	>30	<5	Very high dependence
Yes	20–30	5–30	High dependence
Yes	10–20	30–60	Medium dependence
No	<10	>60	Low dependence

Session 4: Quit date

On the quit date, ideally, the patient will be released from the dental practice as a former smoker. It may be worthwhile to give each individual patient a written recommendation for the use of nicotine replacement therapy (NRT) for the following 3 months (Fig. 4).

- Confirm or redefine the replacements that have been identified.
- Give the patient a written recommendation on NRT on the basis of both his or her smoking behaviour and degree of nicotine dependence.

Relapses and referrals

Experience reveals that smokers have to make several attempts to quit smoking before staying a former smoker. Of the patients who initially succeed in kicking the habit, 50–60% will suffer a relapse within the next year (13, 36). Even though there are at present no evidence-based methods for preventing relapses (36, 37), the dental practice team can continue to offer support during their patients' repeated attempts to quit smoking. Alternatively, the patients can be referred at this time to tobacco use cessation specialists, their family doctors, pharmacists or psychotherapists.

Nicotine replacement therapy

The symptoms of nicotine withdrawal can substantially hamper a person's success to quit smoking. The most common symptoms of nicotine withdrawal are reported to be headache, gastrointestinal complaints, sleeping disorders, depression and increased appetite. Withdrawal usually occurs shortly after the person has smoked his or her last cigarette and occasionally lasts for several days or a few weeks. Withdrawal symptoms can be significantly reduced by pharmacotherapy i.e. with the replacement of nicotine. It can help former smokers to resist their withdrawal and to carry out the replacements instead as planned. NRT (e.g. Nicorette®; Johnson & Johnson, Langhorne, PA, USA and Nicotinell®; Novartis, Basel, BA, Switzerland) is shown to increase success rates by roughly 100%. Additionally, research on NRT consistently revealed that comparable success rates were achieved with the use of nicotine gum, nicotine sublingual tablets or lozenges, or nicotine patches (11).

If there are no medical contraindications for the patient, NRT products can be used without restrictions. Nevertheless, some reservations remain for pregnant women and patients with cardiovascular conditions. Literature suggests, however,

Recommendations for use of nicotine replacement therapy

Last name: _____ First name: _____

Level of nicotine dependence:

- ☐ Very high
- ☐ High
- ☐ Moderate
- ☐ Low

Smoking behaviour:

- ☐ Smokes regularly through the day: Recommendations: use of patch
- ☐ Smokes only at specific times: Recommendations: use of gum

From Day 1 of quitting:

	Patch (mg day^{-1})	**Gum** (number day^{-1})	**Others** (number day^{-1})
1st month			
2nd month			
3rd month			
After 3 months			

Place, Date: _____ Signature: _____

Nicotine replacement	Low nicotine dependency	Moderate nicotine dependency	High nicotine dependency	Very high nicotine dependency
Patch		■	■ in combination with another nicotine preparation	■ in combination with another nicotine preparation
Gum	■ 2 mg	■ 2 mg	■ 4 mg	■ 4 mg
Sublingual tablets	■	■	■ in combination with patch	■ in combination with patch

Fig. 4. Recommendations for use of nicotine replacement therapy form. This form is available for download at http://www.dental-education.ch/smoking/downloads.

that the benefits of NRT for smoking cessation may outweigh the detrimental effects from the continued use of tobacco (11).

Significant success rates from the use of NRT will be achieved when the appropriate product is selected adjusted to (1) the degree of nicotine dependency and (2) the individual smoking behaviour (Fig. 4). In general, patients with 'strong' or 'very strong' nicotine dependency are advised to take combinations of NRT. Furthermore, NRT should be used for the entire duration of the therapy (3 months), while the nicotine dose will be reduced every month as suggested by the manufacturer.

Conclusions

On the basis of recent evidence on the possible recovery of both the oral mucosa and the periodontium following tobacco use cessation, a new task has been emerged in dentistry: the role of oral health professionals providing counselling for patients who ought to quit tobacco use. Even though success rates from dental counselling are limited at a first glance, it has been demonstrated that the support from oral health professionals is yet comparable to that from doctors and psychotherapists. There are several barriers, however, constituting a complex of issues for the dental practice: e.g. the lack of possibilities to charge either patients or insurance companies for such counselling, and the lack of training in tobacco use cessation counselling in the curricula of oral health professionals. Considering the relatively small amount of time for short interventions (5 min each) and for tobacco use cessation counselling (up to four sessions of 15 min each), however, these efforts seem to be justified and may serve not only a public

health benefit but also help to achieve the goal of oral health for all.

References

1 Ramseier C. Potential impact of subject-based risk factor control on periodontitis. *J Clin Periodontol* 2005; **32:** 278–285.

2 Lang NP, Lindhe J, van der Velden U. Advances in the prevention of periodontitis. Group D consensus report of the 5th European Workshop in Periodontology. *J Clin Periodontol* 2005; **32 (Suppl. 6):** 291–293.

3 Axelsson P, Nystrom B, Lindhe J. The long-term effect of a plaque control program on tooth mortality, caries and periodontal disease in adults. Results after 30 years of maintenance. *J Clin Periodontol* 2004; **31:** 749–757.

4 Needleman I, Warnakulasuriya S, Sutherland G *et al.* Evaluation of tobacco use cessation (TUC) counselling in the dental office. *Oral Health Prev Dent* 2006; **4:** 27–47.

5 Binnie VI, McHugh S, Jenkins W, Borland W, Macpherson LM. A randomised controlled trial of a smoking cessation intervention delivered by dental hygienists: a feasibility study. *BMC Oral Health* 2007; **7:** 5.

6 Hogg RC, Raggenbass M, Bertrand D. Nicotinic acetylcholine receptors: from structure to brain function. *Rev Physiol Biochem Pharmacol* 2003; **147:** 1–46.

7 Svensson TH, Grenhoff J, Engberg G. Effect of nicotine on dynamic function of brain catecholamine neurons. *Ciba Found Symp* 1990; **152:** 169–180 (discussion 180–5).

8 Zhang H, Sulzer D. Frequency-dependent modulation of dopamine release by nicotine. *Nat Neurosci* 2004; **7:** 581–582.

9 Wang H, Sun X. Desensitized nicotinic receptors in brain. *Brain Res Brain Res Rev* 2005; **48:** 420–437.

10 DiFranza JR, Wellman RJ. A sensitization-homeostasis model of nicotine craving, withdrawal, and tolerance: integrating the clinical and basic science literature. *Nicotine Tob Res* 2005; **7:** 9–26.

11 Fiore MC, Bailey WC, Cohen SJ *et al.* US public health service clinical practice guideline: treating tobacco use and dependence. *Respir Care* 2000; **45:** 1200–1262.

12 Judge K, Bauld L, Chesterman J, Ferguson J. The English smoking treatment services: short-term outcomes. *Addiction* 2005; **100 (Suppl. 2):** 46–58.

13 Ferguson J, Bauld L, Chesterman J, Judge K. The English smoking treatment services: one-year outcomes. *Addiction* 2005; **100 (Suppl. 2):** 59–69.

14 Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *J Consult Clin Psychol* 1983; **51:** 390–395.

15 Eisenberg D, Quinn BC. Estimating the effect of smoking cessation on weight gain: an instrumental variable approach. *Health Serv Res* 2006; **41:** 2255–2266.

16 Filozof C, Fernandez Pinilla MC, Fernandez-Cruz A. Smoking cessation and weight gain. *Obes Rev* 2004; **5:** 95–103.

17 Warnakulasuriya S. Effectiveness of tobacco counseling in the dental office. *J Dent Educ* 2002; **66:** 1079–1087.

18 Christen AG, McDonald JL Jr, Olson BL, Drook CA, Stookey GK. Efficacy of nicotine chewing gum in facilitating smoking cessation. *J Am Dent Assoc* 1984; **108:** 594–597.

19 Cooper TM, Clayton RR. Stop-smoking program using nicotine reduction therapy and behavior modification for heavy smokers. *J Am Dent Assoc* 1989; **118:** 47–51.

20 Severson HH, Andrews JA, Lichtenstein E, Gordon JS, Barckley MF. Using the hygiene visit to deliver a tobacco cessation program: results of a randomized clinical trial. *J Am Dent Assoc* 1998; **129:** 993–999.

21 Carr AB, Ebbert JO. Interventions for tobacco cessation in the dental setting. *Cochrane Database Syst Rev* 2006: CD005084.

22 Al-Shammari KF, Moussa MA, Al-Ansari JM, Al-Duwairy YS, Honkala EJ. Dental patient awareness of smoking effects on oral health: comparison of smokers and non-smokers. *J Dent* 2006; **34:** 173–178.

23 Gerbert B, Coates T, Zahnd E, Richard RJ, Cummings SR. Dentists as smoking cessation counselors. *J Am Dent Assoc* 1989; **118:** 29–32.

24 Ramseier CA, Mattheos N, Needleman I, Watt R, Wickholm S. Consensus report: First European Workshop on Tobacco Use Prevention and Cessation for Oral Health Professionals. *Oral Health Prev Dent* 2006; **4:** 7–18.

25 Wickholm S, McEwen A, Fried J *et al.* Continuing education of tobacco use cessation (TUC) for dentists and dental hygienists. *Oral Health Prev Dent* 2006; **4:** 61–70.

26 Ramseier CA, Christen A, McGowan J *et al.* Tobacco use prevention and cessation in dental and dental hygiene undergraduate education. *Oral Health Prev Dent* 2006; **4:** 49–60.

27 Ramseier C. Smoking prevention and cessation. *Oral Health Prev Dent* 2003; **1 (Suppl. 1):** 427–439.

28 Klein JA, Guba CJ. Helping patients quit smoking: the role of the dental assistant. *Dent Assist* 1989; **58:** 13–16.

29 Rikard-Bell G, Donnelly N, Ward J. Preventive dentistry: what do Australian patients endorse and recall of smoking cessation advice by their dentists? *Br Dent J* 2003; **194:** 159–164.

30 Stott NC, Rollnick S, Rees MR, Pill RM. Innovation in clinical method: diabetes care and negotiating skills. *Fam Pract* 1995; **12:** 413–418.

31 Rollnick S, Butler CC, Stott N. Helping smokers make decisions: the enhancement of brief intervention for general medical practice. *Patient Educ Couns* 1997; **31:** 191–203.

32 Miller WR, Rollnick S. *Motivational Interviewing.* Guilford Press, New York, 2002.

33 Soria R, Legido A, Escolano C, Lopez Yeste A, Montoya J. A randomised controlled trial of motivational interviewing for smoking cessation. *Br J Gen Pract* 2006; **56:** 768–774.

34 West R, Sohal T. 'Catastrophic' pathways to smoking cessation: findings from national survey. *BMJ* 2006; **332:** 458–460.

35 Fagerstrom KO. Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. *Addict Behav* 1978; **3:** 235–241.

36 Hajek P, Stead LF, West R, Jarvis M.Relapse prevention interventions for smoking cessation. *Cochrane Database Syst Rev* 2005; **1:** 1–40. CD003999.

37 Lancaster T, Hajek P, Stead LF, West R, Jarvis MJ. Prevention of relapse after quitting smoking: a systematic review of trials. *Arch Intern Med* 2006; **166:** 828–835.