

# Improving the effectiveness of tobacco use cessation (TUC)

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This paper includes an update of a Cochrane systematic review on tobacco use cessation (TUC) in dental settings as well as narrative reviews of possible approaches to TUC and a more detailed discussion of referral for specialist TUC services. On the basis of these reviews we conclude that interventions for tobacco users in the dental setting increase the odds of quitting tobacco. However, the evidence is derived largely from patients using smokeless tobacco. Pharmacotherapy (such as nicotine replacements, bupropion and varenicline) is recommended for TUC in medical settings but has received little assessment in dental applications, although such evidence to date is promising. Whether the dental setting or referral to specialist TUC services is the most effective strategy to help people to quit tobacco use is unclear. An effective specialist service providing best available TUC care alone may not be the answer. Clearly, such services should be both accessible and convenient for tobacco users. Closer integration of specialist services with referrers would also be advantageous in order to guide and support oral health professionals make their referral and to maximise follow-up of referred tobacco users. Future research direction may consider investigating the most effective components of TUC in the dental settings and community-based trials should be a priority. Pharmacotherapy, particularly nicotine replacement therapy, should be more widely examined in dental settings. We also recommend that various models of referral to external and competent in-house TUC specialist services should be examined with both experimental and qualitative approaches. In addition to overall success of TUC, important research questions include facilitators and barriers to TUC in dental settings, preferences for specialist referral, and experiences of tobacco users attempting to quit, with dental professionals or specialist services, respectively.

*Keywords: Tobacco use cessation, dental practice, effectiveness, nicotine replacement therapy*

The health effects of tobacco use are both well known and devastating. Based on current patterns, smoking will kill about 650 million people alive in the world today, and if these patterns continue, tobacco-caused deaths worldwide are expected to reach about 10 million per year by the 2030<sup>1</sup>. Most tobacco users state a desire to quit, yet multiple attempts are often required before being successful<sup>1</sup>. The evidence is clear that smokers who receive assistance from health care providers are more successful at quitting than without support<sup>2</sup>. In this regard, the dental team appear to have a unique opportunity to assist patients who want to quit. For

those smokers who regularly visit a dental clinic the opportunity exists for initial and follow-up assistance over time from a trusted health care provider.

Increasingly, the literature suggests that tobacco use cessation (TUC) should be regarded in a manner similar to the management of any chronic disease<sup>3,4</sup>. Instead of being considered a one-off intervention, TUC is likely to require repeated interventions, support, maintenance, monitoring and treatment of relapse. This perspective also implies that as well as successful quitting, other meaningful measures to assess outcomes of TUC may include quit attempts, reduction of smoking and

changes in patients' attitudes. In view of the traditional dental recall approach to oral health, the dental setting can be seen to provide a potentially useful environment to support the long-term, chronic nature of TUC.

For the purposes of this paper, we will focus on a consideration of improving the effectiveness of TUC in the dental setting. The paper commences with an update of a Cochrane Systematic review<sup>5</sup> to understand the current evidence for the effectiveness of TUC. We follow this with a consideration of the possible approaches for TUC in the dental setting and their potential. In conclusion, the last section reviews the rationale for referral for TUC to specialist services.

### Systematic review of current evidence for effectiveness of TUC in the dental setting

The first version of this systematic review was designed to investigate the effectiveness of TUC interventions in the dental setting<sup>5</sup>. The following hypothesis was applied to the included literature: *In dental settings, brief counselling cessation interventions are more effective than usual care for increasing tobacco abstinence rates among tobacco users.* Whilst effectiveness is fundamental to developing policy, other issues such as implementation and barriers to change are important to investigate but are beyond the scope of the focussed question<sup>6</sup>.

The methods followed standard Cochrane Collaboration approaches. This report is a version of a review which is currently being updated and we therefore view it as an interim report. We recommend accessing the Cochrane Library for the final updated review in due course ([www.cochrane.org](http://www.cochrane.org)).

In summary, the criteria for study inclusion into the review included; randomised and pseudo-randomised trials; participants reporting any type of tobacco use (including cigarette and smokeless tobacco use) and receiving oral health interventions by dental professionals; any intervention to promote tobacco use cessation which included a component delivered by a dentist, dental hygienist, dental assistant or office staff in the dental practice setting; and the outcome measure smoking and tobacco use cessation, assessed at least six months from the delivery of the intervention. Biochemical validation of self-reported cessation was not required but was recorded.

We searched both the Cochrane Tobacco Addiction group trials register and the Oral Health Group trials register as well as standard electronic retrieval systems and databases up to the end of June 2008. The updated search identified two additional publications for inclusion to add to the six previously included in 2006. Search terms were included that described participants, interventions, outcomes, and the intervention environment, along with Medical Subject Headings used in MEDLINE and CINAHL to focus on the dental environment. Experts were also contacted to locate unpublished studies in an effort to minimise publication bias.

The records retrieved by the searches were screened for potential relevance by two reviewers against the stated inclusion criteria. Studies of possible relevance were checked for inclusion or exclusion by two reviewers, included studies were retrieved in full text, and data were extracted by both reviewers independently and compared. Lack of agreement was resolved by discussion and consensus. Data were extracted to capture location and environment of trial, protection from bias, characteristics of interventions and types of care-givers and types of outcomes.

One outcome was selected for each study with the most rigorous definition of outcome available with regard to maintenance of abstinence (i.e., continuous *vs.* point prevalence) and type of tobacco abstinence (i.e., all tobacco *vs.* cigarettes or smokeless tobacco only). Rates were based on an intention-to-treat analysis with dropouts and losses to follow-up assumed to be tobacco users. Any difference in numbers lost to follow-up between intervention and control groups were noted.

The outcome from each trial was expressed as an odds ratio (OR). Where cessation was the outcome, it was defined as (number of quitters in treatment group/number of smokers in treatment group) / (number of quitters in control group/number of smokers in control group). The OR was greater than one if people were more likely to quit in the treatment group. A pooled weighted average of ORs was estimated using a random effects model, Mantel-Haenszel method, with 95% confidence intervals. If any studies in a group to be pooled had corrected for clustering or differences between groups, and therefore generated ORs that do not derive directly from numbers of quitters, studies were pooled using the generic inverse variance method, with study results expressed as an estimate of treatment effect and a standard error. Trial quality assessment included consideration of randomisation processes, allocation concealment, and bias impact.

Heterogeneity was explored through subgroup analyses assessing patient characteristics, interventions, outcomes, and method of randomisation.

### Findings

The review included eight studies<sup>7-14</sup>. One study had to be excluded due to unavailability of subgroup denominator values from the authors<sup>15</sup>. An additional study<sup>16</sup> providing one-year outcome data for an included study<sup>10</sup> was retained in order to conduct a sensitivity analysis with two-year outcomes *vs.* one-year outcomes. Five studies were conducted in the dental office setting<sup>7-9,12,13</sup> and three involved oral health professionals (dentists and dental hygienists) providing interventions to athletes within high school or college community settings<sup>10,11,14</sup>. Additional study characteristics are described in (Table 1)<sup>7-14</sup>.

**Table 1** Characteristics of trials included in the systematic review of TUC effectiveness in dental settings

	Setting	Type	Intention	Intervention	Randomization	Follow-up	Outcome
Stevens '95 <sup>13</sup>	Dental office	SLT	Not seeking treatment	Counseling 5 A's	Patient/Pseudo-randomized	6 months	All tobacco, 7 & 30 day PP
Severson '98 <sup>12</sup>	Dental office	Smokers	Not seeking Treatment	Counseling, extended arm 5 A's	Practice	6 months	All tobacco Continuous
Walsh '99 <sup>14</sup>	Community	SLT	Seeking treatment	Counseling, NRT	School	6 months	All tobacco 30 day PP
Andrews '99 <sup>7</sup>	Dental office	SLT	Not seeking treatment	Counseling 5 A's	Practice	6 months	All tobacco Continuous
Gansky '02 <sup>10</sup>	Community	SLT	Seeking treatment	Counseling, 5 A's variant	School	24 months	30 day PP
Gansky '05 <sup>11</sup>	Community	SLT	Seeking treatment	Counseling, 5 A's variant	School	6 months	All tobacco, 30 day PP
Binnie '07 <sup>8</sup>	Dental office	Smokers	Seeking treatment	Counseling, 5 A's, NRT	Patient	6 months	Smoking Cessation repeated PP, 6 & 12 months
Ebbert '07 <sup>9</sup>	Dental office	Smokers	Seeking treatment	Counseling, Quitline	Practice	6 months	Smoking Cessation 7 day PP

**Key:**

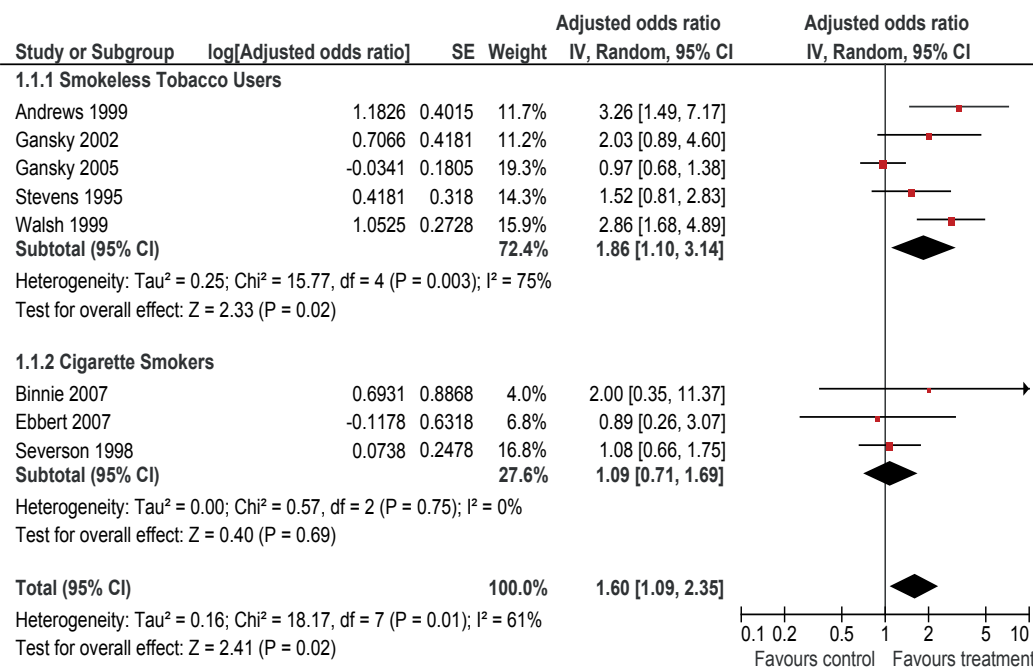
Setting: Study setting (dental office or community)

Type: Tobacco type - SLT refers to smokeless tobacco, smokers refers to cigarettes/cigars

Intention: Of subjects – seeking or not seeking assistance with their tobacco use

Intervention: Behavioral counseling (using 5 A's or variant of this format), NRT (nicotine replacement therapy), or Quitline (proactive tobacco telephone counseling)

Randomisation: Individual patient randomisation or cluster randomisation (by practice or school)

Outcomes: Cessation measures - *All tobacco*, cessation of all tobacco products; *PP*, point prevalence cessation or cessation at the point in time when patients respond; *continuous cessation*, cessation over a continuous time period (time period may vary)**Figure 1.** Forest plot of trials included in the systematic review of TUC effectiveness (odds ratio of quitting tobacco use) in dental settings

### Methodological quality of included studies

Randomisation was adequate in four studies<sup>8-11</sup>. The remaining studies did not report how randomisation was performed or reported it in insufficient detail to determine whether a satisfactory attempt was made to control for selection bias. Pseudo-randomisation based upon last digit of patient identification number was used in one study<sup>13</sup>. No biochemical confirmation was used to validate self-report in four studies<sup>7,9,11,12</sup>. In three studies, biochemical confirmation was initially utilised and abandoned<sup>13</sup>, or used to enhance self-report<sup>10,14</sup>. In one study<sup>8</sup> both cotinine and CO were used for biochemical confirmation at the three and six months assessments, while only cotinine was used for the 12 month evaluation. Ability to blind was limited due to the nature of the behavioural interventions evaluated. One school-based study reported a 'spill-over' bias<sup>11</sup> that was felt to influence the outcomes.

The meta-analysis showed a statistically significant increase in the odds of tobacco abstinence at 12 months or more in the test groups, (OR 1.60, 95% CI 1.09, 2.35) and with statistically significant heterogeneity ( $P=0.01$ ,  $I^2$  61%) (Figure 1). Closer inspection of the subgroups showed a statistically significantly greater odds of quitting in studies with smokeless tobacco users but not for cigarette smoking. All analyses were conducted following adjustment for clustering of patients within practices and schools using the reported ICCs and generic inverse variance method. Unfortunately, due to the limited numbers of studies and data, it was not possible to explain the causes of the heterogeneity.

### What do the results of the review mean?

Although we found that the amount of research published on this topic is limited, the available evidence is consistent with the hypothesis that TUC interventions conducted in the dental office and school community setting can be more effective than usual care for promoting TUC. Whilst the overall effect of the intervention was small, the pooling of the studies in this review represents tobacco abstinence at 12 months or longer which is a demanding, although important outcome measure. Reporting of 12-month outcomes or longer may correlate much more closely with life-long tobacco abstinence than assessments at three or six months. Despite the fact that research on smokeless tobacco was fairly well represented, the literature does not yet provide evidence to support the effectiveness of cigarette smoking cessation interventions in the dental setting.

All of the studies included in this review included brief advice to quit by either a dentist or a dental hygienist, and the beneficial effect of brief advice by a dental professional achieves similar outcomes to those reported for physicians<sup>17</sup>. Although in general our results show a benefit to TUC in the dental setting, there is not enough information available yet to determine what

specific components of interventions provide additional effectiveness beyond brief advice by the dental professional. For instance, personalised feedback from an oral examination that identifying negative tissue effects from tobacco use could prove to be a significant cessation tool, especially in individuals who may be unrealistically optimistic about their susceptibility to disease<sup>13,14</sup>.

In reviewing these studies, it became clear that they employed behavioural interventions of variable intensity as well as the use of additional interventions such as nicotine replacement therapy and quitline referral and this can make comparison trials quite challenging. Other differences between studies are also important to understand in order to interpret the results. The most important of these differences is the make-up of the control groups. For the studies focusing on smokeless tobacco interventions<sup>7,10,11,13,14,16</sup> all control groups received either 'usual care' or no intervention. By contrast, all 'test' groups received behavioural interventions consistent with the 5 As. Therefore the comparison in these studies approximated to that of TUC behavioural modification *vs.* nothing and was similar between trials. However, for the studies focusing on smokers<sup>8,9,12</sup> the control groups differed among the studies. In two trials<sup>8,9</sup>, the controls received a low intensity TUC behavioural intervention while in the remaining study<sup>12</sup>, the control group received no TUC information. Since both test and control groups received a form of TUC intervention (although of different intensity) in these two studies, it is likely that such a comparison would reduce the size of the difference between groups and therefore reduce the evidence of effectiveness.

Biases that might exaggerate the apparent effectiveness of TUC include publication bias. Unfortunately, we were unable to test for this as there were too few studies. Further distortions might have arisen for methodological concerns about the published research and these included inadequate protection from bias, lack of biochemical validation of TUC and wide variations in the nature of the interventions.

In summary, this review has shown that interventions for tobacco users in the dental setting, either in the dental office or in the school community, increase the odds of quitting tobacco. However, the evidence is derived largely from patients using smokeless tobacco. Further research should be designed to investigate and identify the most effective components of TUC in the dental settings. We would also suggest that community-based trials to investigate TUC in smokers in dental settings should be a priority for research funding.

### Should the dental team be engaged in TUC?

It has been widely reported that patients expect their oral health professional to ask about their smoking status<sup>18-20</sup> as part of the overall health assessment. Despite this finding, many oral health professionals have reservations

regarding their role in TUC. These reservations include the possibility that their patient would be offended by a discussion on smoking cessation and leave the practice. The data suggest that this concern is unfounded with 76% of patients disagreeing with such a statement<sup>20</sup>. In their review, Needleman and co-workers reported that only 33-50% of dentists routinely ask patients about their tobacco use and very few documented these data<sup>21</sup>.

In addition to asking, oral health professionals have an ethical, medical and legal responsibility to at least inform the patients of the consequences of tobacco use for prevention as well as treatment. It is thus necessary to include content on tobacco use, disease and treatment in the undergraduate curriculum and continuing professional development for dentists and dental hygienists<sup>22</sup>. Vanobbergen and co-workers concluded in a study on dental students, that better knowledge and belief in effectiveness of tobacco cessation counselling was associated with an increased positive attitude towards tobacco cessation programmes<sup>23</sup>. However, increased knowledge does not necessarily result in behaviour change which is true for both oral health professionals and patients. One study has demonstrated that the patients would expect to receive assistance from their oral health professional should they wish to make a quit attempt<sup>19</sup>. However, the patient recall of receiving such assistance was reported by only 35% of the total study participants. Patients who smoked and were interested in making a quit attempt strongly supported the role of the oral health professional in TUC. It was reported by Needleman and co-workers that between 30-66% of dentists provided at least brief advice<sup>21</sup>. Therefore, the current evidence suggests that the understanding of patient and practitioner perceptions regarding the promotion of tobacco use cessation in the dental setting remains an opportunity for further development.

Even though the current scientific evidence for successful smoking cessation in the dental setting is not robust (see earlier), there are reasons to believe that the dental setting provides a conducive environment for supporting quit attempts. There are apparent signs of smoking habits in the oral cavity such as staining and malodour that could be an evident concern for patients. This obvious demonstration of smoking sequelae could assist in providing a valuable platform for further discussion. Secondly, as patients are visiting the dental office regularly, there is greater opportunity to support tobacco use cessation by treating it as a chronic disease. For the patient who is receiving specialist periodontal care, this scenario is further supported by the acknowledged improvement in treatment outcomes should the patient stop smoking. For those ready to quit oral health behaviour support and NRT appear more promising when used in combination in other health care settings<sup>4</sup>.

### **Possible approaches to behaviour support in the dental setting**

Oral health behaviour support appears to be of importance, however, there is a need to investigate further which models fit into the dental setting<sup>24</sup>. Although previous guidelines indicate that oral health professionals should strongly advise users to quit, other evidence suggests that a more autonomous supportive process could be more effective<sup>25</sup>. In the ongoing relationship between patients and their dental team establishing the patients' goals and supporting their autonomy may be more important than the pressure to quit. One method of behaviour change promotion, Motivational Interviewing (MI), has a demonstrated effect on drug use in other settings<sup>26,27</sup> and has been suggested as a method for smoking cessation counselling<sup>28</sup>. However, the philosophy behind MI does not recommend advising without the patient's implicit permission<sup>29</sup>. MI is a method to explore and approach the patients' willingness to change behaviour and if the patient does not want to change, it is necessary for the caregiver to accept such a statement. This MI philosophy may represent a significant paradigm shift for oral health care providers who are more comfortable with an advisory role as the 'expert' in the patient-clinician relationship. MI has been used in the dental setting in prevention of dental caries and the authors stated that MI is a promising approach that warrants further attention in a variety of dental contexts<sup>30</sup>.

In addition, the component stage of change from the transtheoretical model has also been suggested as a potential tool to support behavioural change<sup>31</sup>. The model involves five different stages from precontemplation to maintenance phase and depending on which phase the patients are in, the communication needs to be altered. In a recent study where the stages of change model was used in combination with MI they found that a modest short-term benefit and a positive movement in stages among adolescents<sup>32</sup>.

Whichever approach is taken to support health behaviour change, it is important to recognise that every member of the oral health professional team can contribute to the promotion of tobacco use cessation. A coordinated programme from the intervention to ongoing support can assist the patient to maintain their tobacco-free status<sup>33</sup>. In the currently available literature, the dental hygienist has undertaken most of the interventions in a dental setting. The nature of the role of the dental hygienist offers a valuable opportunity to promote behavioural change that may improve the oral health of the patient. For example, it is well evidenced that standard protocols such as improved levels of plaque control are integral to the long-term stability of periodontal health. However, there are currently a limited number of standardised protocols or frameworks for tobacco control. Therefore, there is an opportunity for the dental hygienist to apply the promotion of tobacco use cessation within the established framework of other oral health interventions such as plaque control.

## Nicotine replacement therapy (NRT)

The literature demonstrates that the provision of NRT can assist in the alleviation of the symptoms of nicotine withdrawal for the patient undergoing a quit attempt when used according to the manufacturer and smoker's profile<sup>34</sup>. The most common symptoms of nicotine withdrawal are headache, gastrointestinal complaints, sleeping disorders, depression and increased appetite. These can appear shortly after the person has smoked his or her last cigarette and can last for several days or weeks. All of these symptoms can be reduced markedly by a selectively administered pharmacotherapy involving nicotine called 'nicotine substitution.' Nicotine substitution can help former smokers to give up their smoking habits and to accept the planned ersatz measures as new habits without succumbing to the physical longing for nicotine in cigarette form. Therapy with nicotine-containing medication approximately doubles the success rate of quitting<sup>33</sup>. Studies have demonstrated comparable success rates were via the use of sustained-release chewing gum, sublingual tablets or lozenges, and nicotine skin patches<sup>34</sup>.

If there are no medical contraindications, nicotine substitution products can be used by all patients. However, they are recommended only with reservations for pregnant women and patients with cardiovascular problems. The available literature suggests, however, that the benefits of nicotine substitution for smoking cessation far outweigh the detrimental effects of continued tobacco use<sup>35</sup>. The best results are achieved with nicotine products when the product is selected with an eye to the degree of dependency and smoking behaviour of the smoker who wants to quit. In general patient with 'strong or 'very strong' nicotine dependency are advised to use combinations of nicotine products<sup>35</sup>. Patients who have smoked for a long time including those 'hard core smokers' for whom trying to quit is very challenging, due to a combination of socioeconomic factors and high dependency may require longer usage of NRT<sup>36</sup>.

NRT should be combined with thorough advice and support, much as the dental team are familiar with providing for oral hygiene aids. This approach helps to avoid incorrect use which can lead to less successful quitting. Fiore and co-workers<sup>4</sup> have recognised seven first-line medications (five nicotine and two non-nicotine) to reliably increase long-term smoking abstinence rates: NRT: gum, inhaler, lozenge, nasal spray and patch. The non-nicotine medications available are bupropion and varenicline.

### Sustained-release nicotine gum

Sustained-release nicotine gum is available in 2mg or 4mg doses with a neutral taste or various tastes, e.g. peppermint or citrus. Chewing this gum too fast can lead to irritations in the mouth and throat as well as to a burning sensation in the stomach, hiccups or nausea.

For this reason, patients are advised to follow the manufacturer's instructions exactly: chew the gum for only 10 seconds and then deposit it in your cheek pocket for a minute, chew again for 10 seconds and deposit in your cheek pocket for another minute. The chewing activity is the catalyst for nicotine release from the gum. Chewed in this way, this gum can release nicotine for around 30 minutes. Another point to observe is not to drink liquids directly before or during chewing as the nicotine absorption is influenced by the environmental pH.

### Sublingual nicotine tablets or lozenges

Sublingual nicotine tablets or lozenges are placed under the tongue, where they dissolve within 30 minutes. They are often used instead of nicotine gum in situations where chewing gum in public should be avoided. The tablets should be taken once every hour to every two hours. Normally 8-12 tablets are an adequate daily dose. The maximal daily dose should not exceed 24 tablets. The tablets should not be sucked, chewed or swallowed. This is because nicotine can cause hiccups and a burning sensation if it reaches the stomach.

### Sustained-release nicotine patch

Nicotine is absorbed relatively slowly from the sustained-release nicotine skin patch. The highest concentration of nicotine in the blood is usually reached within 4-9 hours after application of the patch. For this reason, the patch is suitable for former smokers whose cigarette consumption was distributed evenly over the day. Since the plasma nicotine concentration drops again 9 hours after application of the patch, heavy smokers are advised to combine the patch with some other nicotine-containing medication, e.g. gum or sublingual tablets. The patch is applied to cleaned, dry and unbroken skin. The most frequently reported side effects of the nicotine patch are skin irritations, which can be prevented by changing the site of application. The manufacturer's instructions should be followed precisely when using the nicotine patch. The patches release a decreasing amount of nicotine, e.g. 15mg/16 hrs, 10mg/16 hrs and 5mg/16 hrs, during the first, second and third months after the patient has stopped smoking. Patches are also available in a 21mg format, and can be used overnight in very dependant smokers.

These patches can also be used as pre-quit nicotine patches, providing 'therapeutic' nicotine and have been recommended for use prior to the cessation of smoking in some countries. The manufacturer suggests that the dosage delivered via the pre-quit nicotine patches two weeks prior to smoking cessation assists in decreasing the cravings to smoke. Once the smoker has stopped smoking, the recommended use of nicotine patches can be implemented. This approach has been found to provide a robust increase in quit rates compared to current

regimens. A recent meta-analysis<sup>37</sup> identified a double fold increase in quit rates using the pre-quit patches. This new approach seems to be a reversed reflection of how the patient became addicted – gradually. It would be reasonable to assume that most smokers do not start their 10 or 20 cigarettes per day habit the first time they smoke. The habit increases over time with the influence of pharmacological and psychological addiction. Therefore, the approach of moving from high to low levels of the addictive substance prior to complete abstinence may provide additional benefits in promoting smoking cessation.

### **Bupropion and Varenicline**

There are other pharmacotherapies that can be used to support a quit attempt. Bupropion (Zyban), originally used to in the treatment of depression, can approximately double the odds of quitting (OR 1.94, 95% CI 1.72-2.19)<sup>38</sup>. However, the side effects of bupropion can include insomnia, dry mouth and nausea. This medication can also cause seizures, with a 1:1000 risk at the drug levels used in smoking cessation. Bupropion takes time for the levels to build in the body, with the patient taking the medication for around 1-2 weeks before quitting.

Varenicline (Chantix, Champix) is a newer drug which has been developed specifically for smoking cessation and is thought to work by reducing the strength of the smoker's urge to smoke and by relieving craving and withdrawal symptoms<sup>39</sup>. Varenicline increased the chances of quitting between two- and three- fold, compared with placebo (OR 3.85, 95% CI 2.70 to 5.50)<sup>40</sup>. More participants quit successfully with varenicline than bupropion. The main side effect of varenicline was nausea, mostly mild to moderate in intensity, which usually subsides over time. Smokers should set a quit date to stop smoking and treatment with varenicline should start one to two weeks before this date. Varenicline is increasingly being used with high dependency smokers. As with other drug treatments, best results with regards to quitting are achieved with patients, if combined with behavioural support.

Future research should focus on the effectiveness (and cost-effectiveness) of smoking cessation counselling in the dental setting. There is a need for randomised controlled trials (RCT) to test different interventions designed to be as close to the dental setting as possible. The reason for the need for RCTs is that they are the only research design with the potential for a reliable evaluation of cessation, especially where differences in quit rates between study groups may not be large (although relative small differences are likely to be important from a public health perspective). It is not ethical to compare such interventions against a no treatment control group by withholding information about tobacco-use cessation. Therefore we should be aware

that the comparison of the cessation intervention will always be against a control group comprising some form of 'minor' intervention. Qualitative research will also play a vital role in exploring the experiences of tobacco users attempting to quit in the dental setting as well as those of healthcare workers.

### **Referral to external quit tobacco services**

The purpose of this section is to review the evidence supporting dental professionals making referrals for tobacco counselling, in contrast to them providing the counselling in-office. We will first review the evidence comparing the efficacy of the two models. Next we will consider whether patients are likely to follow through with referrals. Finally we will consider whether dentists are more likely to provide referrals over in-office counselling.

### ***Efficacy of in-house counselling compared with specialist referral***

We conducted a PUBMED search using the following logic: 'tobacco'[MeSH Terms] OR 'tobacco'[All Fields]) AND ('counselling'[All Fields] OR 'counseling'[MeSH Terms] OR 'counseling'[All Fields]). This produced 1,189 papers. This field was next limited to papers concerning dentists or dental hygienists, using the following logic: ('dentists'[MeSH Terms] OR 'dentists'[All Fields]) OR ('dentistry'[MeSH Terms] OR 'dentistry'[All Fields]) OR ('dental hygienists'[MeSH Terms] OR 'dental'[All Fields] AND 'hygienists'[All Fields]) OR 'dental hygienists'[All Fields]). This narrowed the list to 141 papers. All these papers were examined to locate studies that compared the efficacy of dental professionals providing in-house counselling with dental professionals referring out for counselling. Only two studies were relevant to this criterion<sup>9,41</sup>.

Both of these studies employed designs which randomly assigned private dental practices into either the condition of providing referrals to telephone quit lines, and/or providing brief cessation counselling. In addition, one study<sup>41</sup> randomised practices into a third 'usual care' group. In both studies, the intervention (either brief counselling or referral to quit line) was made after patients had been asked about tobacco use and advised to quit. If the patient then expressed an interest in quitting, the intervention was performed. The referral intervention involved patients filling out a form which was then transmitted to a telephone quit line service, which then contacted the patient for telephone counselling.

Neither study found a difference in quit rates between tobacco users who received the brief counselling and those who were referred to a telephone quit line. Both studies had problems with statistical power; one experiencing low numbers of participating practices

and subjects<sup>9</sup> and the other reporting unusually low quit rates across all treatment conditions<sup>41</sup>. In view of these problems, it is perhaps best to be cautious and conclude that they were unable to support or refute evidence of a difference between the two approaches. However, the studies do suggest that referral to a proactive telephone quit line is similarly as effective as providing brief counselling in-office.

### **What is the take-up of specialist referral?**

To address this question, the 1,189 papers about tobacco counselling located as described above were limited to those addressing referrals for tobacco counselling. The original search was limited to papers identified with the following logic: 'referral and consultation'[MeSH Terms] OR ('referral'[All Fields] AND 'consultation'[All Fields]) OR 'referral and consultation'[All Fields] OR 'referral'[All Fields]. This produced 67 papers. Examination of these papers revealed five studies in addition to the two already discussed which described the rates at which patients followed through with referrals for tobacco counselling, whether dental or not<sup>42-46</sup>. When the contact with a patient was initiated by a quit line telephone counsellor, rates of follow-through varied from 47% to 70%<sup>9,41-43,45,46</sup>. We were able to locate only one study of follow-through rates of patients when the intervention required patient initiation. In that study, the patients were referred to a smoking cessation programme consisting of a class, and none of the 20 patients followed through<sup>44</sup>. It would seem that if the referee institution actively solicits patients who have agreed to quit, and if the referrals are to a convenient method of counselling such as a quit line, the rate of follow through will be enough to consider it approximately equivalent to in-office counselling.

### **Dental professional's preference for counselling location**

The 141 papers found by searching for tobacco counselling crossed with dental professionals as described above were examined for information regarding dental professionals' preference for referral compared to in-office counselling. By searching through the abstracts of these papers, we located 22 that were surveys of dental professionals' attitudes and behaviours regarding tobacco counselling.

Of the 22 surveys of dental professional practices, eight were rejected as we arbitrarily set a publication date of 2000 to identify more contemporary research. Of the 14 remaining papers, no studies were found that specifically asked for dentists' preference between referral and in-house counselling. However, the existing surveys of behaviour were fairly consistent, and their results suggest a reasonable policy direction.

All the surveys seeking the information determined that certain tobacco cessation activities were more prevalent than others. The prevalence of these activities varied by country and by specialty, but the rank ordering of prevalence was consistent. Recording tobacco use history 'Asking' was the most prevalent, followed by 'Advising' the patient to quit. 'Assessment' of both degree of tobacco dependence and willingness to quit were both next in order of frequency. Finally, the various methods of 'Assisting' and 'Arranging' were characterised by the least frequency. Both referring a patient for tobacco counselling and providing in-house tobacco counselling fall into the Assisting and Arranging categories, and are engaged in with the least frequency. Eight papers reported a low incidence of dentists even asking or advising about tobacco use one paper each from Jordan<sup>47</sup> Sweden<sup>48</sup> and Germany<sup>49</sup>, two from the USA surveying orthodontists<sup>50,51</sup>, and three surveying paediatric dentists or dentists about children<sup>52-54</sup>. Of the seven surveys reporting that dentists asked, advised and assessed regularly, all reported that practices of assisting or arranging were much less prevalent. Of the seven studies, five were from the USA<sup>55-58</sup> one from Sweden<sup>48</sup> one Australian<sup>59</sup> and one English<sup>60</sup>. The Swedish study was included in both categories, because Swedish dentists reported asking about smoking but not about spit tobacco use, and reported very low incidences of arranging or assisting for either.

### **Conclusions**

In summary, the evidence indicates that neither referral nor the provision of in-office counselling is widely offered by dental professionals currently. Therefore, we suggest the following regarding specialist referral:

Specialist referral tobacco-use cessation services should be more widely available. These services will need to be convenient for patients' use, convenient for dental professionals to arrange and well advertised (marketed) to the dental community.

The referral service should proactively contact the tobacco users willing to quit to encourage greater participation in the programme.

It is likely that dental professionals could be more readily trained to use such a system than in providing in-office counselling. As a result, it would be anticipated that quit rates will be higher following referral. However, dental professionals with an interest in providing such specialist care would be encouraged to do so, as long as they have undertaken appropriate training.

Where such specialist referral is not available in-office counselling should be offered in helping patients quit.

Robust and appropriate study designs should be used to evaluate the impact of specialist referral from dental settings on tobacco-use quit rates and experience of care compared with in-house counselling and brief interventions.

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