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Editorial

# Giving up smoking

Since the recognition of the health hazards associated with tobacco smoking[1] techniques designed to aid smokers to quit have proliferated. The concerned physician or layman is faced with a bewildering array of methods to apply to the individual smoker to aid abstention from tobacco and with a number of conflicting strategies to apply to society as a whole to limit tobacco smoking.

At the centre of this controversial subject is our basic lack of knowledge about why an individual first takes up the habit of smoking and why he or she continues despite recognising the hazard. Furthermore, over the last decade millions of people have voluntarily given up smoking[2] without any direct assistance from the health agencies. Again we have little information on the makeup of the successful ex-smoker and what contributes to this modification in behaviour.

Despite the lack of basic understanding there is an extensive array of publications on smoking withdrawal. The individual physician finds it hard to draw useful guidance from the diverse information available. In this editorial a selection of the more popular approaches to aid quitting smoking will be reviewed and particular attention will be given to those making use of substitutes for tobacco smoking.

Before we consider these approaches it may be helpful to describe what is at present understood about the psychological makeup of smokers and, perhaps more importantly, of successful ex-smokers. In addition, it is important to understand some of the external factors which influence the prevalence of cigarette smoking.

## Profile of a smoker

Smokers are considered to differ from non-smokers in their psychological makeup, tending towards extraversion[3]—that is, tending to be people who crave excitement, who are willing to take risks, and who are more sociable and easy going. This is particularly true for men. Neuroticism or anxiety may be also important in their make up,[4] although tobacco dependence may itself lead to greater neuroticism.[5] A further interesting psychological classification that has been applied to smokers and non-smokers is the concept of internal and external loci of control. Smokers tend to be more externally controlled,[6] believing that fate, luck, or things generally outside themselves control their lives. Finally, smokers consume more caffeine, alcohol, and other psychotropic drugs than do non-smokers.[7]

Adult smokers are likely to have many smoking friends.[8] Probably the most important family influence on maintenance of smoking is the smoking habit of the spouse or cohabitant.[9] The increasing militancy of non-smokers and increasing restriction of public opportunities to smoke[10] may act to tighten the ranks of smokers, making support from smoking friends all the more important.

Professional and technical workers have the lowest cigarette smoking rates, while unskilled workers have the highest.[11] This relationship is strong in men, though women show the opposite trend. Furthermore, the most upwardly mobile individuals in social terms, with respect to their parents, are the least likely to smoke.[12]

One of the most striking findings to emerge from surveys over the last 20 years has been the increase in smoking among teenage girls, with no corresponding increase in the prevalence in teenage boys.[12] The changing sex role of women as manifested by changes in higher education and the nature of their work may be important.

## Profile of a successful ex-smoker

Discrimination on psychological grounds between a successful ex-smoker and a continuing smoker is less easy than that between non-smoker and smoker. For example, ex-smokers tend to be more extrovert but less neurotic than smokers.[13] Those with "type A" personalities, who are hard driving, ambitious, and competitive, are less likely to quit than "type B" people, with the opposite characteristics.[14] Heavy use of other drugs, such as caffeine or alcohol, lessens the chances of successful abstinence from smoking.[4]

The most important considerations in determining the success of abstinence, however, are the smokers' own use of cigarettes and that of his or her friends. There is mounting evidence that heavier cigarette

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smokers are markedly less able to quit than lighter smokers, who perhaps have less dependence on tobacco.[15] A further important powerful influence on ability to quit is whether the smoker's spouse or cohabitant continues to smoke.[9] Successful abstainers are also more likely to have friends who are former smokers.[16]

Men are much more likely to succeed in abstaining than women.[16] With the growing convergence of male and female roles in society, however, this effect may be lessening.

## Some general influences on smoking in society

In addition to those factors influencing an individual's attitudes and behaviour, powerful forces are at work within society. The dramatic changes noted in adult smoking, especially among middle aged men and professional groups, may in part be attributable to the information and education campaigns which have taken place since 1964.[17] While specific events like the publication of the 1964 Surgeon General's report and the Royal College of Physicians' report may have had only small and transitory effects on smoking cessation, the cumulative effects of persistent publicity probably has had more influence. Bans on television advertising for cigarettes in several countries, including the United Kingdom, Denmark, Ireland and New Zealand, have had only a small effect upon per capita cigarette consumption.[18] In the United Kingdom the ban on television advertising produced a statistically insignificant fall of 3%.[19] The loss of advertising on the television was compensated for by the channelling of advertising into displays and promotion, making it difficult to evaluate the television ban per se. Cigarette smoking remains prevalent, however, in Communist countries, where there is no advertising.

The price of cigarettes may well be important in determining consumption.[19] This may be particularly so at the present time of slow rates of growth of real income in the face of an increasing range of consumer products.

Factors other than price, level of advertising, and antismoking policy must be at work in determining the considerable differences in sales of tobacco goods between countries and the variation of market size in any one country with time. This is clearly shown by a recent comparison of per capita sales of tobacco in countries in the Organisation for Economic Cooperation and Development that have similar gross national product to the United Kingdom.[20] Interestingly, the countries with the most well developed antismoking policies—for example, Norway and Finland—are those in which the tobacco market was least well developed.

## Withdrawal techniques and strategies

It is against this background of multiple factors influencing both an individual's smoking habit and society's attitudes to smoking that a physician is left with the task of evaluating the many alternative approaches to aid cessation in his smoking patient.

There have been considerable improvements in the quality of data on smoking cessation methods in recent years. In particular, controls and random assignment of treatment have been introduced into studies. Long term follow up for at least six months and often for over a year have been included. Perhaps the most important advance has been the introduction of biochemical tests to verify self reported abstinence from smoking. While these tests—measurement of alveolar carbon monoxide,[21] blood carboxyhaemoglobin,[22] nicotine, cotinine,[23] and thiocyanate[24]—remain imperfect they permit the identification of up to 20% of self reporting cigarette abstainers who are actually continuing to smoke.[25]

Despite these definite improvements, broad generalisations about efficacy of measures against smoking are still made without proper reference to factors such as age, sex, social class, or previous smoking habit. Little effort is made to control for clinical zeal. Many studies remain methodologically deficient in some respects. The clinician needs to be cautious when attempting to assess the relative merits of new methods.

## Specific intervention: nicotine substitution

Recently attention has focused on the so called pharmacological and psychological aspects of tobacco smoking in which nicotine dependence or habituation plays an important role.

Tobacco smoke inhalation appears to satisfy both physiological and psychological needs in the smoker. Among the myriad of compounds in smoke, nicotine is the most powerful pharmacological agent,[26] acting on both sympathetic and parasympathetic ganglia. Two psychopharmacological models contribute to our understanding of the role of nicotine. The first is the suggestion that nicotine is a drug of addiction, and the second is that nicotine is used as a psychological tool.

Several aspects of the smoker's behaviour suggest that nicotine dependence is a primary reinforcer of the smoking habit. Some smokers appear to titrate their requirement for nicotine[27] and many smokers experience symptoms of withdrawal.[28] Nicotine does not, however, appear to have the characteristics of abuse liability of the established "drugs of addiction": beyond overcoming the initial aversive prop-

Table *Rates of successful abstinence from smoking using nicotine gum*

| *Reference* | *Validation method* | *Follow up (m)* | *Percentage treatment success* | | | | *Diseased or healthy* | *Allocated or volunteer* |
|---|---|---|---|---|---|---|---|---|
| | | | *Chewing gum* | | *Advice only* | *Control* | | |
| | | | *Active* | *Placebo* | | | | |
| 36 | COHb and thiocyanate | 12 | 10 | 14 | 9 | | Diseased | Passive |
| 37 | COHb | 6 | 26 | 28 | | | Healthy | Volunteer |
| 38 | Expired CO | 6 | 63 | 45 | | | Healthy | Volunteer |
| 39 | Expired CO | 12 | 47 | 21 | | | Healthy | Volunteer |
| 40 | COHb | 6 | 23 | 5 | 14 | | Healthy | Passive |
| 41 | COHb or expired CO | 12 | 38 | | 14 | | Healthy | Volunteer |
| 42 | COHb | 12 | 23 | | | | Healthy | Volunteer |
| 43 | Expired CO | 12 | 9 | | 4 | 4 | Healthy | Passive |
| 44 | Expired CO | 12 | 30 | 20 | | | Healthy | Volunteer |

CO—Carbon monoxide; COHb—Carboxyhaemoglobin.

erties of nicotine, smokers do not appear to develop an increasing tolerance to the drug. Studies of intravenous self administration show that nicotine is a less robust reinforcer of habit than other drugs of abuse—for example, heroin.[29] Nevertheless, the proportion of smokers who appear to be dependent on their habit appears large by comparison with those dependent on other socially sanctioned drugs—for example, alcohol.

An alternative model for the smoker's behaviour views smoking as a "psychological tool."[30] Analysis of questionnaire data suggests that, in addition to dependence on nicotine, both the stimulant and the sedative action of smoking are important motives for smoking.[31] Administration of nicotine to non-smoking subjects improved their short term performance in tasks requiring rapid information processing,[32] presumably through control of electrocortical arousal. Several animal studies have shown that the effect of nicotine on arousal is biphasic, initial stimulation being followed by a compensatory phase of depression. It is likely that smokers could learn to modulate their level of arousal through smoking.

Whichever of these models is preferred, the potential value of sources of nicotine other than tobacco in controlling smoking is clear, particularly during initial withdrawal. Interest in substitutes for tobacco has been wide ranging, encompassing both pharmacological analogues such as lobeline and alternative means of nicotine administration such as nicotine chewing gum,[33] snuff,[34] and nasal sprays or aerosols of nicotine.[35] The most thoroughly explored of these substitutes is nicotine containing chewing gum.

The results of some of the studies of the use of nicotine chewing gum in which abstinence from smoking was verified biochemically are summarised in the table. Follow up in these studies varied from six months to one year. Healthy people and those with diseases associated with smoking have been included and studies on individuals who volunteered to participate in a study of withdrawal have been distinguished from those in which participants merely agreed to receive treatment to discourage smoking. Although we must be cautious about comparing these different studies it becomes clear that people who volunteer for smoking abstinence programmes are more likely to succeed whatever is offered them than those smokers who are simply allocated a treatment. In general, however, smokers who volunteer for smoke cessation appear capable of being aided by nicotine containing chewing gum. This probably offers a simple means of identification of those smokers attending a physician who would be most suitable for this approach. How long the tobacco substitution should continue remains uncertain. It is maintained usually for only three months during the initial withdrawal period, but a case could be made for extending this period. Further work in this area is necessary.

The physician is still left with the question of how best to help the patient with a low level of motivation to quit smoking. The size of this problem in clinical practice is well illustrated in the British Thoracic Society (BTS) study (p 651), where long term abstinence was achieved by less than 10% of patients with smoke related disease. Treatment was randomly allocated and nicotine chewing gum was found to offer no more help in giving up smoking than advice or placebo gum.

**Non-specific intervention**

Bernstein[45] commented over 15 years ago that clinics specialising in smoking withdrawal, where counsellors offer advice and guidance, have had more effect on research and clinical activity than on smoking behaviour. The comment remains valid in 1984. In general, fairly equivocal results have been reported by specially designed antismoking clinics.

Most achieve 15–20% long term abstinence, but inferior results are seen where biochemical verification of self reporting is used.[24]

In contrast to smoking withdrawal clinics that offer general advice, a physician's advice to a patient to quit smoking may have a greater impact, particularly in the presence of dramatic symptoms.[46] This effect is seen in patients recovering from myocardial infarction.[23] This trend is further supported by the BTS study (p 651), again particularly in men who have suffered a myocardial infarction. Other identifiable health professionals, such as nurses, may be as effective as doctors.[47] Although there remains uncertainty about the content of the advice that should be given, there is clearly a need to exploit all of the opportunities offered when a smoker presents with concurrent medical problems.

Hypnosis[48] and acupuncture[49] have been suggested as aids to abstinence and both enjoy some popular support. Reports of controlled studies have, however, shown little convincing evidence and a legacy of chaotic early studies leaves considerable doubt about the efficacy of these forms of treatment.

The use of aversive stimuli to reduce the probability of smoking—for example, electric shock treatment—does not appear to contribute significantly to the response of human subjects.[50] Rapid smoking procedures may be an effective aversion treatment, but concern has been expressed about their safety.[51] Interestingly, there are no reports on the effect of behavioural treatments such as yoga on smoking cessation.

## Controlled smoking

The disappointing results of these measures force the physician to consider how best to cope with the majority of patients who continue to smoke despite all the aids to abstinence. Although strictly not within the realm of quitting smoking, a case can be made for considering controlled smoking, to lessen the risks to health associated with continued smoking.

The first step is to reduce the amount of inhaled smoke. There have been dramatic changes in the types of cigarette smoked over the last 20 years. Filter cigarettes have become the norm and average tar yields have declined significantly.[52] This probably reflects the desire of most smokers to reduce the risks of smoking. Anxieties have been expressed about this approach because of uncertainty about what components of tobacco smoke are associated with the development of disease. Reduction in tar yield is, however, likely to contribute to a decline in the risk of developing lung cancer and ischaemic heart disease.[53] Furthermore, human smokers do not necessarily smoke in the same way as the analytical smoking machines on which cigarette tar yields are determined. For example, when smokers "switch" from higher to lower tar cigarettes there is evidence that they inhale more smoke or "oversmoke."[27] This may be the result of a need to increase the uptake of nicotine, as the falls in cigarette yields of tar have been generally associated with a corresponding reduction in nicotine yield. There seems to be some uncertainty about the degree of "oversmoking" of low tar cigarettes. Rawbone demonstrates in this issue (p 657) that in the smokers' own environment, as opposed to the laboratory setting, the degree of oversmoking of low tar cigarettes appears to be small. Interestingly, like other workers he did not find any increase in the number of low tar cigarettes consumed daily.

One way to avoid oversmoking of lower tar cigarettes is to increase the yield of nicotine relative to tar.[54] Such higher nicotine but low tar cigarettes would be unlikely to require compensatory oversmoking. Indeed, there is now some evidence that lower tar cigarettes with enhanced nicotine yield are proving popular among smokers.

It is possible to control the level of tobacco exposure not only by reducing the number and strength of the cigarettes smoked but also by altering the manner in which cigarettes are smoked.[55] Smokers can be encouraged to take fewer puffs of smoke from a cigarette and to inhale less. The long term stability of such changes still needs to be verified before this behavioural approach can be applied generally.

Alternatively, cigarette smokers may switch to smoking pipes and cigars.[46] While these forms of smoking are not usually associated with inhalation and pipe and cigar smokers carry only a small increased risk, ex-cigarette smokers who switch appear to continue to inhale.[24] Inhalation presumably is controlled at an unconscious level. The cigarette smoker who switches can therefore achieve comparable or even increased tobacco smoke exposure. The change in form of tobacco use cannot be recommended as a form of controlled smoking unless specific training is offered to alter the manner of smoking.

## How should a physician approach smoking cessation?

From this review it is clear that there are only weak pointers to the best course of action. Nevertheless some tentative guidelines can be offered.

Firstly, it should be recognised that initial cessation is only the start of treatment. Continued assistance and support should be planned from the start, perhaps by the use of health professionals other than

physicians.

In the presence of illness associated with smoking, advice on its own appears effective when offered by a physician or other health professional. Consideration should be given to counselling the spouse or cohabitant who continues to smoke. Above all, advice should be offered with kindness, enthusiasm, and awareness of the many factors which may be influencing the continuation of the smoker's habit. Punitive approaches may be counterproductive and lack compassion. Explanation of the psychological effects of withdrawal should be offered and fears of symptoms such as weight gain during abstinence should be allayed.

Alternative sources of nicotine other than tobacco in the form of nicotine gum or nasal spray may have a particular place in the withdrawal programme for smokers who are highly motivated to stop. This approach may also be more effective in smokers showing a pharmacological dependence on nicotine as determined by the smoking patterns test questionnaire.[31]

For those smokers who consistently fail to quit, advice should be directed towards controlled smoking with the aim of achieving at the least a significant reduction in the number of cigarettes smoked and a change to the brand of cigarette offering the lowest tar yield.

## Conclusion

More information is needed about why people take up smoking, particularly in the case of the young, so that coherent strategies for prevention can be devised. An historical analysis of international comparisons of usage of tobacco goods might be useful in identifying the cultural factors which determine smoking habits within each country. For those inveterate smokers who are unable or unwilling to quit we need to know even more about the elements of tobacco smoke which are associated with development of disease so that at least their risks can be minimised. There is a need to identify more clearly the factors which most influenced the millions of smokers who have successfully abstained without requiring direct medical advice. The relatively limited success of intervention in smoking cessation programmes compared with spontaneous cessation emphasises the fact that we remain largely ignorant about the causes of a form of behaviour undertaken by just under 40% of the population in the United Kingdom.

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