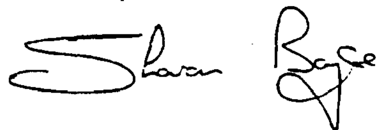
Circulation: BATCo No 1s/Public Affairs Managers
Scientific Research Group

Enclosed are some views on the Surgeon-General's 20th report: "Nicotine Addiction" published earlier this week. Please do not hesitate to contact me for any further information that is required.



Dr Sharon Boyse
Corporate R&D Department
Millbank

cc Mr N B Cannar
Mr R L O Ely

20th May 1988

300535912

BATCo document for Province of British Columbia 29 October 1999

BATCO 00094931

The 20th Report of the Surgeon-General makes the following conclusions:

- Cigarettes and other forms of tobacco are addicting.
- Nicotine is the drug in tobacco that causes addiction.
- The pharmacologic and behavioural processes that determine tobacco addiction are similar to those that determine addiction to drugs such as heroin and cocaine.

The Surgeon-General uses the following criteria for drug dependence (or addiction):

Primary criteria

- Highly controlled or compulsive use
- Psychoactive effects
- Drug-reinforced behaviour

Additional criteria

- Addictive behaviour often involves:

  sterotypic patterns of use
  use despite harmful effects
  relapse following abstinence
  recurrent drug cravings

- Dependence - producing drugs often produce

  tolerance
  physical dependence
  pleasant (euphoriant) effects.

1. It is well-known that there has been considerable conflict among scientists in developing a satisfactory definition of addiction/dependence and the criteria that can be considered as representative of addiction. Even bodies such as the World Health Organisation, the American Psychiatric Association etc. have recognised this difficulty, and have produced definitions that have not been universally accepted.

   The Surgeon-General has produced his own list of criteria that he considers to be important. This is open to exactly the same criticisms as earlier definitions and need not be viewed as definitive. In fact, more importantly, the Surgeon-General's definition of addiction differs in various important ways from previous definitions (see below). Unfortunately, the changes made have made it much easier to compare nicotine with addicting drugs than was previously possible; nicotine could not convincingly be incorporated into traditional definitions. So, for example, we find that the Surgeon-General:

   (i) has relegated certain criteria of addiction to the bottom of his league table. Unfortunately, these happen to be the criteria that have always been agreed to be critical to any definition of addiction: tolerance, physical dependence, and euphoria. These also happen tto be the criteria for which conviincing evidence on nicotine has never been forthcoming (see below).

300535913

BATCo document for Province of British Columbia 29 October 1999

BATCO 00094932

(ii) These important criteria now take second place to some rather vague, new criteria e.g. 'psychoactive effects' and 'drug-reinforced behaviour'; reasons why it is rather strange to consider these criteria as primary are discussed in detail below.

2. The simplest way of considering the Surgeon-General's argument and the reasons why his theory that nicotine is addictive is not acceptable, is to consider each of his criteria in turn, and the evidence for nicotine's relevance to each of these criteria. Even with the Surgeon-General's new definition it is apparent that nicotine does not fit comfortably into his scheme.

1. Highly-controlled or compulsive use

Compulsive use has been a component of many previous definitions. Compulsive use, as elaborated by the WHO (1957) is: "... an overpowering desire or need (compulsion) to continue taking the drug and to obtain it by any means". This degree of 'compulsion' hardly seems to apply to tobacco; many smokers have interesting patterns of smoking behaviour by which they smoke at work but not at home, and vice versa. This is hardly characteristic of 'compulsion'.

2. Psychoactive effects

Any drug that affects mood or behaviour in any way is generally classified as a psychoactive drug. This does not mean that any psychoactive drug is addictive. For example, caffeine is classified as a psychoactive drug, and by this line of reasoning coffee would be addictive. Antidepressants are a major class of psychoactive drug because they alter mood, but there has never been any suggestion that they are addictive. Nicotine's psychoactive effects are extremely difficult to measure and by no means as apparent as the psychoactive effects of heroin, amphetamine, alcohol, valium etc.

This criterion has never appeared in any major definition of addiction/dependence in this simple form.

As support for the inclusion of this criterion, the Surgeon-General says that, "to distinguish drug dependence from habitual behaviours not involving drugs, it must be demonstrated that a drug with psychoactive (mood-altering) effects in the brain enters the blood stream". However, this distinction is inherently illogical for the following reason: psychoactive drugs are able to alter mood and behaviour because they mimic the effects of naturally-occuring chemicals in the brain that are responsible for normal behaviour not involving drugs. On the basis of what happens in the brain under normal circumstances, it is not possible to qualitatively distinguish between 'normal' and drug-induced behaviour. The difference is, in fact, usually a quantitative one (more of a particular chemical present; increased activity of particular brain cells).

300535914

BATCo document for Province of British Columbia 29 October 1999

BATCO 00094933

3. Drug-reinforced behaviour

This criteria is included on the basis of studies carried out in animals. Some evidence shows that the behaviour of laboratory rats (e.g. pressing a lever in a box) is 'reinforced' by nicotine i.e. rats will press a lever as a result of which they obtain a nicotine injection. However, this finding has to be put into perspective: it is well-known that laboratory rats will also press a lever to obtain food, water, milk, saccharin, chocolate ... 'Addiction' is not a necessary corollary. Also, early studies in this field suggest that is extremely difficult to find the correct circumstances under which rats can be induced to lever-press for nicotine. With drugs such as heroin, rats will work extremely hard for the compound under any circumstances e.g. they will press a lever thousands of times to obtain one injection. This is not so with nicotine.

4. Stereotypic patterns of use

This means that a behaviour may develop into regular temporal and physical patterns of use. It is a characteristic pattern of human behaviour to adopt 'stereotypic' patterns of doing things i.e. meals tend to be taken at particular times, tea and coffee are taken at particular times, people sleep at particular times. There is no evidence that cigarette smoking is a particularly unique example of a stereotypic pattern of behaviour; in fact, it is frequently less stereotyped than food intake!

5. Use despite harmful effects

Whether or not cigarette smoking causes certain diseases has still to be established and further scientific and medical research is required. However, even if it should be established that it constitutes a health risk, humans frequently indulge in behaviour that may involve potentially harmful consequences e.g. flying, driving. The fact of participating in an activity that has a risk associated with it does not mean that one is addicted to it. In spite of regular warnings by health officials that certain behaviour (e.g. eating certain types of food) may entail harmful consequences, these behaviours are continued. In many previous definitions of addiction 'harmful consequences' has tended to refer to harm to society. This may well be the case for drugs like heroin, when a breakdown in the psychological functioning of the individual may lead to serious consequences for society e.g. crime etc; however, it can hardly be applied to cigarette smoking.

6. Relapse following abstinence

Many definitions of addiction have cited, as a preferred criterion, difficulty in abstaining; however, with cigarette smoking this does not apply as millions of people worldwide have given up successfully. Once they have given up, some people do indeed begin smoking again. However, this does not mean they are 'addicted'. It may mean that, for them, the perceived benefits of smoking (improved concentration etc. - see David Warburton) are great enough that they prefer to continue to smoke. People frequently give up certain behaviour or habits, only to begin again.

300535915

BATCo document for Province of British Columbia 29 October 1999

BATCO 00094934

7. Recurrent drug cravings

The Surgeon-General defines this in the following way: urges (cravings) to use a drug may be recurrent and persistent. 'Craving' is a rather tenuous concept that no-one has been able to define satisfactorily. Again, it does not apply solely to drugs, and certainly not solely to 'addictive' drugs. People can 'crave' for anything that they enjoy doing, once they are deprived of it or are not able to do it at a particular time, e.g. sex. Are all such behaviours 'addictive'?

8. Tolerance

Although 'tolerance' apparently occurs quite rapidly to the initial effects of cigarette smoking e.g. nausea, dizziness, there is little evidence that tolerance develops to the 'psychological' effects of smoking (e.g. stress relief, improved concentration etc). The idea of tolerance of necessity carries with it the assumption that as you habituate to the effects of a substance, it is essential to take in more of it to try and regain the initial effect. This does not occur at all with cigarette smoking. Smokers rapidly arrive at their preferred number of cigarettes per day, which can vary widely. This pattern tends to remain stable for years and there is little evidence that people increase their level of smoking as they get older. In fact many smokers in recent years have switched from high tar (and therefore high nicotine) cigarettes, to low tar (and therefore low nicotine) cigarettes. This argues totally against tolerance and dependence.

9. Physical dependence

The existence of physical dependence is an inference made from the observations of a stereotyped withdrawal or abstinence syndrome that occurs in the vast majority of users when a chronically-administered drug is discontinued. Shiffman (1979) concluded that "... the presence of an abstinence syndrome is crucial to the definition of drug dependence". However, there is considerable doubt as to whether any symptoms that smokers may experience when they stop smoking are a result of true withdrawal, or merely symptoms of frustration encountered by many people when they decide to give up something that they enjoy. Cigarette 'withdrawal' symptoms', such as they are, differ widely from one individual to another, are totally absent in many people that give up smoking, and are minor compared to symptoms that occur upon giving up drugs like heroin.

300535916

BATCo document for Province of British Columbia 29 October 1999

BATCO 00094935

10. Pleasant (euphoriant) effects

Euphoriant effects tend to go hand in hand with behavioural intoxication e.g. alcohol is a euphoriant, and by and large intoxication accompanies (or is a result of) the euphoria. No behavioural intoxication accompanies cigarette smoking or intake of nicotine. One of the major studies that has been used to suggest that nicotine is euphoriant is a study by Henningfield (1984). In this study nicotine was compared to a series of drugs such as cocaine and heroin, and was reported to produce similar levels of ratings of euphoria by subjects. However, this study has been extensively criticised (e.g. by David Warburton) because the ratings of euphoria were so variable that in some cases subjects who took placebo (no drug) rated it as euphoric! This is apparent when one examines the data from the study, but is not stressed in its conclusions.

3. Conclusions

The Surgeon-General's report concludes that nicotine, and therefore tobacco products are addictive. However, this conclusion is based upon a novel definition of addiction that has many flaws and contains many new criteria which other eminent scientists have not considered to be appropriate to the question of addiction. Furthermore, even if one adopts the Surgeon-General's criteria, it is still debatable whether nicotine fits the criteria. Many aspects of the behaviour of cigarette smoking which would argue against his theory are not considered in the report.

Dr S Boyse
Corporate R&D Department
BATCo (Millbank)

SB/LES
20th May 1988

300535917

BATCo document for Province of British Columbia 29 October 1999