Clinical Problems

Cigarette Dependence: I—Nature and Classification

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A teenager need smoke only twice to have a 70% chance of smoking for the next 40 years if he lives so long. This follows from the facts that only 15% of adolescents who smoke more than one cigarette avoid becoming regular smokers¹ and that only about 15% of smokers stop permanently before the age of 60.² When asked why they smoke many smokers are at a loss for a satisfactory answer. Few can claim they enjoy every cigarette they smoke and there are some who get little positive pleasure. Only after a pause for consideration are reasons for smoking gradually elicited—such as, "Habit I suppose," "It calms my nerves," or "It helps me to concentrate."

While genetic, social, psychological, and pharmacological factors have been demonstrated in the causation of cigarette dependence, their synthesis into a coherent explanation of how they operate and interact in the individual case is lacking. However, it is apparent that the onset of smoking during adolescence is determined by an interaction of social and psychological factors, while its maintenance is due largely to dependence on the pharmacological effects of nicotine.²

Dependence Disorder

Three out of four current smokers either wish to or have tried to stop smoking, yet only about one in four succeeds in becoming a permanent ex-smoker.¹ Thus most smokers smoke not because they wish to but because they cannot easily stop. This is a feature of a dependence disorder. Smoking is certainly associated with other dependence disorders; 92% of alcoholics³ and 99% of heroin addicts⁴ are smokers compared with 58% of the general population.⁵ Intermittent or occasional cigarette smoking occurs only in about 2% of smokers.¹ People who smoke at all sooner or later become regular, dependent smokers.

Most people smoke to obtain nicotine and are unsatisfied by nicotine-free cigarettes. Only 9% of male and 19% of female cigarette smokers deny that they inhale.⁵ Smokers unconsciously modify their puff rate to maintain a steady nicotine intake when given high or low nicotine cigarettes.⁶ Intravenous nicotine reduces cigarette consumption significantly compared with saline control.⁷ Nicotine is taken up within a few minutes of smoking by receptors in the brain, where its action is rapid, complex, and varied. It may act as a stimulant or sedative. It shares with other dependence-producing drugs the quality of acting as a primary reinforcer of behaviour, in that animals will self-inject it for its own sake. It is in some way intrinsically rewarding.

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SCHEME for CLASSIFYING SMOKING according to the PREDOMINANT PATTERN of REINFORCEMENT

Note: The types of smoking are shown in circles; the types of positive reinforcement in boxes. The arrowed lines indicate the inter-relationships — for example, it is shown that "tranquillization smoking" may be reinforced by sensory rewards or by the sedative effect of nicotine or by a combination of these.

Apart from subjective withdrawal symptoms such as depression, tension, irritability, restlessness, intense craving, and difficulty in concentration, there is evidence that some smokers exhibit physical withdrawal effects—namely, sleep disturbance, sweating, gastrointestinal changes, and a fall in pulse rate and blood pressure.⁸ There are also reports that cigarette withdrawal causes E.E.G. changes⁹ and impaired performance in simulated driving¹⁰ and certain monotonous psychomotor tasks.¹¹ There is little doubt that in addition to psychological dependence many cigarette smokers fulfil the criteria for physiological dependence—namely, tolerance and physical withdrawal effects.

Classification of Smokers

In the past smokers have been simply classified as heavy or light, inhaler or non-inhaler, regular or intermittent, etc. More recently two sophisticated attempts have been made to type smokers. The first is based on the use of smoking to control affect (Horn-Tomkins typology^{12 13}), and the second classifies smokers according to the occasions on which they smoke (McKennell-Thomas typology¹). Both studies have made use of the statistical procedure known as factor analysis. However, this does not make them foolproof, since the analysis is performed only on the data submitted and much of relevance may have been left out. In fact, the Horn-Tomkins typology omits the important oral and social aspects of smoking, and the conscious and unconscious symbolic meanings of smoking are also ignored. McKennell and Thomas were able to draw a useful distinction between smoking for social reasons and smoking to satisfy an "inner need," probably for nicotine.

Smoking behaviour is dependent on the balance of its positive and negative reinforcers. Smokers may be classified according to the pattern of positive reinforcers, or motives, that maintain their smoking. These motives fall into three main groups—psychosocial rewards, sensory rewards, and pharmacological rewards (see Fig.). Psychosocial rewards include smoking to conform and to gain acceptance as well as use of the symbolic values of "toughness" and "precocity"¹⁴ provided by smoking to increase social confidence. Sensory rewards include the many sensory satisfactions (taste, smell, handling, watching the smoke, etc.) as well as the more specific oral gratifications. Pharmacological rewards include the euphoriant, sedative, and stimulant effects of nicotine as well as the powerful drive of withdrawal relief in physiologically dependent cases.

Some complexity in classification is inevitable since smokers range from those who absorb virtually no nicotine to those with a high intake. The majority probably absorb a moderate amount of nicotine. Similarly there may be a distinction of smokers among those dependent on sensory and those dependent on pharmacological rewards, but this distribution is probably more towards dependence on the pharmacological rewards. Further complexity arises in that the sensations and activities of smoking may be conditioned by frequent association with the powerful pharmacological rewards of nicotine to become increasingly rewarding themselves as secondary reinforcers.

Five Types of Smoking

The figure illustrates how five types of smoking are derived from the various reinforcers of smoking behaviour. The types are not mutually exclusive. A single smoker may, for example, smoke for tranquillization as well as indulgent motives.

Psychosocial Smoking.—Here the rewards are all psychosocial. There may be virtually no nicotine intake. This type of smoking is largely confined to the early stages of smoking during adolescence. Smoking is intermittent and tends to occur only in social situations. Outside these there is little desire to smoke. For the majority absorption of nicotine soon ensures evolution to smoking for pharmacological rewards, but in the few who do not inhale an intermittent psychosocial type of smoking may persist for years. Alternatively there may be gradual evolution to smoking for sensory rewards.

Indulgent Smoking.—This is smoking purely for pleasure and may occur in many situations—watching television, resting after work, while reading. The pleasure may be derived from predominantly oral rewards (oral-indulgent), sensorimotor rewards (sensorimotor-indulgent), or a mixture of these rewards (mixed-indulgent). The oral-indulgent smoker will do most of his smoking in association with or instead of other oral activities—for example, after meals or with tea, coffee, or alcohol—and tends to resort to oral compensations when giving up smoking. Indulgent smoking is not completely regular. Periods of two to three hours without smoking are common, especially when the smoker is busy and otherwise absorbed, yet smoking may be frequent on indulgent occasions.

Tranquillization Smoking.—Use is made of the sedative effect of nicotine and the calming effect of oral gratification and the occupation of the hands to relieve anxiety and tension. Frequency of smoking varies greatly with emotional state.

Stimulation Smoking.—Use is made of the stimulant qualities of nicotine to maintain performance and allay fatigue when performing monotonous tasks like long distance driving or to enhance performance and alertness in demanding creative tasks such as writing or meeting deadlines in hectic commercial situations. Frequency of smoking increases greatly in these specific situations.

Addictive Smoking.—Here the smoker experiences withdrawal symptoms whenever he has gone 20-30 minutes without smoking, and he smokes to avoid or relieve this distressing state. Smoking frequency varies little with changing external situations. It begins soon after waking, ceases only during sleep, and is regulated to maintain a high level of nicotine in the brain.²

(The medical management of cigarette dependence will be discussed next week in Part II of this article.)

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