Current Comments

Nicotine Addiction Is a Major Medical Problem: Why So Much Government Inertia?

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Readers of *Current Contents*® are probably familiar with my feelings about the smoking habit.[1,2] I particularly dislike being forced to suffer the choking pollution so casually created by most smokers. On the other hand, I'm especially appreciative of smokers who understand my concern. Many other non-smokers feel the same way. It doesn't make sense to us that smokers maintain their habit in obvious disregard of its dangers and costs. Nevertheless, this is not without an understanding that the smoker has a need which can at best be delayed only temporarily.

The dangers and costs attributed to smoking are legion. Smoking is linked to a number of diseases: cardiovascular disease; cancers of the throat, lung, mouth, pancreas, and urinary bladder; peptic ulcers; decreased fertility; and increased still-births and spontaneous abortions.

Society loses the most from the smoker's habit. A few years ago the National Institute of Drug Abuse (NIDA) published an important volume on smoking behavior research. In this work, on which I will draw heavily below, Bryan Luce and Stuart Schweitzer (UCLA School of Public Health) state that smoking results in a major drain of the nation's economic resources in both direct health care costs and the costs associated with lost earnings due to sickness and death.[3] The NIDA estimates that smoking-related illnesses cost the American public nearly $8 billion in 1975. Lost earnings resulting from smoking-related illnesses and deaths totalled nearly $18 billion. By comparison the $170 million cost of smoking-caused fire damage seems small. But the National Fire Prevention and Control Administration says that smoking-caused fires account for 47% of all fire-related deaths and injuries.[4]

Most smokers will agree that their habit is dangerous and costly. The majority of them *want* to quit but few are successful. A 1967 survey of adult and adolescent smoking habits in Britain indicated that 77% of current smokers want to stop.[5] However, only one in five stops permanently.

Many non-smokers find it especially ironic and annoying that smokers often dislike the habit. There is a common view that smokers are simply weak people with little will-power. This is a distorted view of a *significant medical problem*. Smoking is more than just a bad habit that is socially and physically unacceptable to non-smokers. Smoking is a *powerful physical addiction*. I agree with M.A.H. Russell, senior lecturer and honorary consultant psychiatrist at Maudsley Hospital Addiction Control Unit, UK, who asserts, "Cigarette-smoking is probably the most addictive and dependence-producing form of... self-administered gratification known to man."[6] Unfortunately the evidence is

growing that the statement is now equally applicable to women.

I cringe when I recall a recurring scene from my youth. A beautiful young woman, dressed as a cheerleader, would stand on the corner outside my high school giving away sample packets of cigarettes. Her supply was inexhaustible: she was never empty-handed. She and her colleagues were the predecessors of the drug-pushers who now pervade the educational establishment. Whether she realized it or not, she was pushing the powerful addictive drug called nicotine.

Unfortunately, most people do not acknowledge this *addictive* aspect of smoking. In fact, the 1964 Surgeon General's Report alleged that smoking is not an addiction because "there are no withdrawal symptoms, no tolerance is developed, and no anti-social behavior is elicited."[7]

Not surprisingly, the Tobacco Institute in Washington, DC, the chief lobbying group for the tobacco industry, also maintains that smoking is not an addiction. Ann Browder, assistant to the president of the Institute, explains: "If nicotine is addictive, we wonder why 30 million people have given up the habit since 1964. Cigarette smoking is not addicting, as opposed to being habituating, in that an individual who began smoking a pack or a pack and a half a day doesn't have to increase that consumption in order to satisfy the desire to smoke. Our stand is certainly that it is habituating but not addictive."[8]

The distinction the Tobacco Institute draws between habituation and addiction has been called artificial by the World Health Organization (WHO). In its reports, WHO has replaced both terms with a single term: drug dependence.[9] Since the 1964 Surgeon General's Report was issued, there has been convincing research to show that at least one component of tobacco, nicotine, is a dependence-producing drug, as defined by WHO: "a drug having the capacity to produce a state of psychic or physical dependence, or both."[9]

WHO defines drug dependence as "a state, psychic and sometimes physical, resulting from the interaction between a living organism and a drug, characterized by behavioral and other responses that always include a *compulsion* to take the drug on a continuous or periodic basis in order to experience its psychic effects, and sometimes to avoid the *discomfort of its absence* [withdraw]. *Tolerance* may or may not be present."[9]

Tolerance is indicated when the addict becomes accustomed to the initial effects of the drug. Also, it usually involves a physical change of some kind in the addict. In its third report on smoking and health, the Royal College of Physicians stated that nicotine fits the definition of tolerance: "When inhaling cigarette smoke for the first time most people have symptoms such as palpitations, dizziness, sweating, nausea and vomiting.... If they continue to smoke, they acquire a tolerance to nicotine, and over a period of two or three years the smoking pattern usually changes so as to allow a high intake of nicotine.... The metabolic type of tolerance also occurs, in that smokers metabolize nicotine more efficiently than do nonsmokers."[10]

Withdrawal symptoms are those "which follow sudden withholding of a drug to which a person has become addicted."[11] (p. 1483) The regular smoker feels withdrawal symptoms an hour or two after his last cigarette. Stanley Schachter, professor of psychology at Columbia University, observes, "Restrained smokers appear to be chronically more irascible, to nibble more, and to have poorer concentration than unrestrained smokers."[12] Russell adds, "Such [withdrawal] symptoms as depression, anxiety, restlessness [and] intense craving...have frequently been described.... More recently, objective physical withdrawal effects have been clearly demonstrated and include sleep

disturbance, sweating, gastrointestinal changes, drop in pulse rate and blood pressure, disturbed time perception... impaired performance at simulated driving...and EEG changes."[5]

Jerome Jaffe, professor of psychiatry at Columbia, points out that society is unwilling to recognize these withdrawal symptoms as signs of illness. Jaffe reported, "Even where severe withdrawal phenomena do occur...society generally has taken the view that such signs and symptoms are 'normal' and to be expected under the circumstances. While tremulousness following abrupt withdrawal of alcohol, or autonomic disturbances from withdrawal of opiates are equally to be expected under the circumstances, they are, for some reason, not regarded as equally 'normal under the circumstances' and are viewed as representing signs of illness."[13] In short, alcohol addiction is now viewed as an illness (it wasn't always) but smoking has not yet reached that stage in the public's perception of the problem.

Smokers are compelled to smoke to avoid the disagreeable symptoms of withdrawal. Compulsion is "an irresistible impulse to perform some act contrary to one's better judgment or will."[11] (p. 332) Not only did 77% of the British smokers surveyed in 1967 want to quit but they also gave good reasons for quitting.[5] Smoking causes physical harm and discomfort, is expensive, and is increasingly disapproved of by other people. Since only one in five of those surveyed quit permanently it is clear that the majority of smokers act against their will and better judgment. For them, cigarette smoking is a compulsion.

I can't avoid mentioning here a certain woman Ph.D. who makes frequent TV and public appearances on behalf of the Tobacco Institute. She is one of those one in five who smokes out of free will. She is well paid to convince smokers that they should cling to their habit in spite of the statistical evidence that smoking is disease related. None of those statistics applies to them, she says. My contempt for such misuses of science is difficult to express briefly. While it may not matter what she says to today's smokers who can't quit even if they want to, it does matter that she convinces individuals who haven't started smoking that they may be exempt from the laws of probability.

Like other addictive compulsions, cigarette smoking leads to antisocial behavior when the available supply is restricted. Gwenda Blair, writing in *Mother Jones*, claims: "Data from Germany after World War II indicates that even under conditions of extreme deprivation, and in situations where food rations were under 1,000 calories a day, smokers still bartered eats for smokes.... Smokers' need for cigarettes was so overwhelming that some also... prostituted themselves or stole other goods that could be traded for cigarettes."[14]

It should be obvious that cigarette smoking is not a minor vice. Nicotine, "the most powerful pharmacological agent in cigarette smoke,"[15] is in the same chemical family as the poison strychnine, the medicine quinine, the hallucinogen mescaline, and the addictive pain relievers cocaine, opium, morphine, codeine, and heroin. Russell suggests that nicotine is addictive because it stimulates the hypothalamus, which is considered to be the "pleasure center" in the brain. He states, "It is likely that the special feature of dependence-producing potential possessed by some psychoactive drugs [including nicotine] rests in their ability to either directly or indirectly influence the hypothalamic reward system."[5] He claims that stimulation of the hypothalamus is a more powerful reinforcer of behavior than hunger, thirst, and sex.[5]

Some researchers now believe that nicotine is the *most* powerful addictive drug. Russell also quotes a survey indicating that 85% of those who smoke

more than *one* cigarette develop a dependence on nicotine.[5] Thus, nicotine addiction is established even more quickly than heroin addiction.

Robert Dupont, former director of the NIDA, estimates that nearly 70% of people who ever smoked (and are still alive) still smoke on a regular basis.[14] He compares this to less than 15% of people who ever used heroin and are still alive and addicted. Once established, the smoking habit is harder to break than addiction to heroin. In fact, heroin addicts consider nicotine to be more "needed" than heroin. In 1974, 278 British opiate users were asked to list a number of drugs in subjective order of greatest personal need. They rated nicotine above heroin, methadone, amphetamine, barbiturates, LSD, cannabis, alcohol, and tea or coffee.[5] I'll have more to say about coffee in a future essay.

There are several reasons why nicotine is more addictive than other dependence-producing drugs. First, the beginning smoker inhales around 200 puffs of nicotine-rich smoke in his or her first pack of cigarettes. The heroin user starts off with only one or two shots a week. The pack-a-day smoker "shoots up" more than 50,000 nicotine puffs in a year! Behavioral psychologists agree that the strength of a habit increases with the frequency of its reinforcement.[5, 16] Nicotine forms the most addictive habit because it is reinforced most frequently.

A second factor affecting habit strength is the timing of reinforcement. After heroin enters the bloodstream through intravenous injection, it takes almost 14 seconds for it to reach the brain. Nicotine enters the bloodstream through the lungs—it takes only eight seconds for it to reach the brain and pay off its pharmacological rewards.[5] The Australian Council on Smoking and Health says this rapid absorption explains why nicotine is so much more dependence-producing than alcohol and other drugs.[16] I suppose when you are addicted, six seconds faster can seem like a vast improvement.

Third, cigarette smoking is a socially accepted habit. The Royal College of Physicians contrasts the role of cigarette smoking with alcohol and barbiturate use in society. "Most people who drink alcohol or take sleeping pills are able to do so in moderation or on special occasions and can tolerate periods without them. It is only a small minority who become alcoholics or addicts. Furthermore, dependence on alcohol or barbiturates usually occurs in settings of psychological or social difficulty. With cigarette smoking the situation is altogether different. The most stable and well-adjusted person will, if he smokes at all, almost inevitably become dependent on the habit."[10]

As any cigarette smoker will tell you, it is much harder to kick the habit than to acquire it. Since the 1950s, when public withdrawal clinics first opened in the Scandinavian countries, there have appeared almost as many smoke control programs as there are brands of cigarettes. Jerome Schwartz, chief of health care research at the California Department of Health, Sacramento, classifies the variety of smoke control programs into nine categories: individual counseling by health professionals; educational programs sponsored by schools or commercial groups; group control activities sponsored by volunteer associations, foundations, commercial groups, and health departments; medications used to help smokers overcome their habit and withdrawal symptoms; hypnosis; behavioral conditioning; self-control procedures; mass-media programs on the risks of smoking and ways to kick the habit; and community efforts to involve neighborhoods and cities in educational programs.[17]

Given the evidence for physical dependence on nicotine, you would think that smoke control programs concentrate on handling withdrawal prob-

lems. However, most do not. It is no coincidence that these smoke control programs show disappointingly low cure rates. Schwartz surveyed 123 smoking cessation programs and found that only one-fifth had success rates of 40% or better. Nearly one-half of the programs had success rates of 21% or *less*. This would seem to be the expected rate based on the British data. Only three of the programs in the survey claimed success rates higher than 70%.[17]

Edward Lichtenstein, professor of psychology at the University of Oregon, Eugene, admits that behavioral programs are generally unsuccessful because they ignore nicotine dependence as one of the more important clinical aspects of smoking behavior. He says, "Most social learning workers, including myself, consistently ignore the implications of a large body of research which suggests that nicotine is a primary reinforcer for smoking and that, at least for heavy smokers, there are internal or physiological stimuli that drive the smoking habit.... The challenge for social learning workers is to incorporate this information on physiological processes into treatment programs. At least, we should probably cease trying to persuade smokers that their habit is entirely or even largely under external stimulus control."[18] (Incidentally, a social learning worker is a psychologist who studies the situational and environmental factors influencing a person's behavior.)

The Five-Day Plan, organized by the Seventh-Day Adventist Church, uses the educational and group approach. While it acknowledges nicotine as an addictive drug, the Plan encourages people to overcome their habit by changing their attitudes toward both themselves and cigarettes. V.E. Gardner, medical director of the Five-Day Plan at the Philadelphia Better Living Center, explains, "We strongly follow concepts of nicotine as an addictive drug with very definite withdrawal symptoms. The plan is designed to minimize these. The withdrawal symptoms clear up in less than one week if no cigarettes are used. We get together each day to support each other during the few days of withdrawal. During this time, focus is placed on changing attitudes—toward the cigarette and towards oneself. The cigarette must not be looked upon as a reward or its denial a deprivation. New health promoting behavior gives a new self image in which smoking is out of character. It is these changed attitudes that are of real help in preventing a return to smoking, for the psychological craving persists even after the physical withdrawal symptoms have cleared."[19]

Smokers in the Five-Day Plan attend five consecutive group-therapy sessions, each lasting one and one-half hours. Sessions include lectures, films, and discussions on the psychological aspects of the smoking habit and ways to overcome it. The Five-Day Plan also encourages physical fitness exercises, balanced diet, hot and cold showers, and abstention from tea, coffee, and alcohol. A series of monthly follow-up meetings is organized to make sure that those who have quit or cut down on their smoking continue to do so.

During the five days of treatment, between 70% and 100% of the participants stop smoking. But, Schwartz points out, "Follow-up reports indicate that recidivism is high.... In-residence treatment at the Seventh Day Adventist Church's facility in St. Helena, California, showed 35% cure rates a year afterward."[17] Data from ten Five-Day Plan programs in different parts of the world show cure rates ranging from 16% to 40% after periods ranging from six months to five years.[17] Again we find that only about one in five can break the habit. Evidently, the changes in attitude and self-image are less permanent than the persistent physiological craving for nicotine.

The Smokenders program uses a behavior modification approach to help

the smoker kick the habit. The program is designed with nicotine addiction in mind. Participants are given "assignments"—things to do which physically and psychologically recondition them for withdrawal. Lois Rafalko, vice president for program and training at the Smokenders headquarters in Phillipsburg, New Jersey, explains, "We do things to deal with the physiological withdrawal in advance. It happens gradually so that on the day when the member stops smoking he doesn't have the physical trauma of 'cold turkey.'"[20] Cold turkey is the abrupt cessation of drug intake, at which time the drug user begins to feel symptoms of withdrawal.

Participants in the Smokenders program attend eight weekly sessions, each lasting two hours. The first five sessions are smoking sessions—participants can smoke as much as they choose. But participants must stop smoking completely on the day after the fifth session. The last three sessions are reinforcing meetings that prepare reformed smokers to live without the habit. As long as people are not smoking they can return after the program ends for continued reinforcement.

The gradual and "painless" modification of smoking behavior makes the Smokenders program one of the more successful methods. Rafalko claims that 80-85% of those who complete the program are not smoking at all at the end of eight weeks. At the end of one year, 70% of those who quit smoking in the program are still not smoking. These data have not been confirmed by independent reviewers. Let's hope it is true.

Any program that tries to change smoking behavior faces a number of problems from the start. First, little has been done to identify tried and true smoke control techniques. Instead, researchers are influenced by currently popular ideas. Lichtenstein states, "The complexity of smoking permits a wide variety of social learning strategies and tactics to be applied. Unfortunately, choices often seem to depend on current fads or trends rather than flowing from a clinical and empirical analysis of smoking behavior itself."[18]

Also, behavioral smoke control programs must treat a large number of variables. Phoebus Tongas, chief psychologist at the Kaiser-Permanente Medical Center, says, "[Smoking] is under the control of such a great number and variety of discriminative stimuli and reinforcers that the task of eliminating it for long periods of time is immensely difficult as every research study has shown."[21] Lastly, the number of variables is multiplied by the number of individual smokers. John Pinney, director of Health, Education, and Welfare's Office of Smoking and Health, remarks, "If we've got 53 million smokers, we've got 53 million different kinds of smokers."[22]

Treating the cigarette habit as a physical addiction makes the problem of kicking the habit simpler. Instead of balancing hundreds of behavioral stimuli and reinforcers, the researcher can concentrate on the relatively few physiological motivations behind nicotine dependence. Pinney says, "If we can find some common denominators between [smokers]—biochemical or otherwise—then that will help."[22]

Schachter, suggests one such biochemical common denominator. He was interested in the smoker's claim that smoking is calming in stressful, anxious situations. Using a number of experimental subjects and strategies, Schachter found that "the smoker's mind is in the bladder."[12] Stress results in making the urine more acidic. When the urine is acidic nicotine is flushed out of the body. The smoker begins to feel withdrawal symptoms as the level of nicotine in the body decreases. "When the urine is alkaline, only one fourth as much nicotine is excreted as when the urine is acid; this is explained by the fact that nicotine base is reabsorbed from an alkaline urine."[12]

Psychologist James Fix at the Univer-

sity of Nebraska in Omaha thinks this biochemical fact can be practically applied to kick the smoking habit. Fix and co-workers divided a total of 42 subjects into three groups. One group took daily supplies of sodium bicarbonate, which decreases the acid content of the digestive system. Another group took vitamin C, which raises the acid content. The third group took a placebo.[23]

After five weeks, Fix reported "totally astonishing" results: "The bicarbonate group's average daily consumption dropped drastically to 0.14 cigarettes, while the vitamin C group and placebo groups went to 7.8 (up slightly from the fourth week); moreover, bicarbonate takers proved more likely to abstain from smoking for a 48-hour period."[22] Fix cautions that these results are preliminary, since many variables were not controlled in the experiment. However, they are encouraging enough to support the original idea that increased alkaline content makes the craving for nicotine less compelling.

There is good reason to be excited by Fix's advance in smoking control research. Any advance that does not depend upon a behavior modification program is bound to be valuable. It should encourage basic research scientists and others involved in clinical research because a cure for the disease is attainable. Whether we are coming closer to a cure is debatable. The Australian Council on Smoking and Health asserts, "An effective cure [for smoking] would rank with the discovery of penicillin in its effect on the health of mankind."[16] Russell adds, "The effective control of cigarette smoking is potentially the most important health measure that is likely to be open to us for the rest of this century."[5]

But it will not be enough to cure smokers of their addiction to nicotine. It is even more important to prevent people from getting hooked in the first place. This involves changing society's attitude toward the smoking habit. Recently, WHO's Expert Committee on Smoking Control recommended that "nonsmoking be regarded as 'normal social behavior' and [that] governments ...step up antismoking legislation to establish that objective.... The purpose of smoking-control measures is not to punish the smoker but to encourage recognition of non-smoking as the norm."[24] Perhaps when the smoke clears a bit society may see the wisdom in this position.

Not only would it be illegal for cigarette companies to dispense samples to adolescents, but the government would be ready to discourage tobacco growing. One cannot ignore the economic significance of the cigarette industry. Cigarettes will be produced even if all forms of advertising and promotion are banned. Tobacco production will stop only when a better use for tobacco crop land is found. This is difficult to achieve because thousands of small farmers derive high income from a few acres of tobacco. The complicated nature of agricultural politics makes it doubtful that we would curtail tobacco farming to eliminate "the most lethal of all breathable pollutants."[16] Consider how difficult it has been to prevent production of the poppy plants needed to produce heroin.

The tobacco industry is well aware of society's changing attitude toward the cigarette habit and of the increasing restrictions on cigarette advertising and smoking in public places. As a result, it has turned to Third World countries in order to bolster declining sales. Blair points out that the Third World market is ripe for exploitation because it is "eager for symbols of Western affluence and still unencumbered by health and advertising regulations."[14]

Another recent article noted that the US government is helping the tobacco industry market cigarettes to the Third World at the same time it helps to alleviate malnutrition there. "Perhaps the most cynical foreign use of tobacco by the United States has been the inclusion of tobacco in the...'Food for Peace'

program of concessional agricultural sales to needy countries. This supposedly humanitarian aid program has been manipulated...to get rid of unwanted domestic tobacco surpluses, to introduce foreigners to US tobacco in hopes of nurturing a future commercial market, and to provide aid to politically favored governments."[25]

But the Third World countries are not as ignorant as the tobacco industry hopes. China, the world's leader in cigarette production, recently acknowledged the link between cigarette smoking and cancer. "The government's first anti-smoking effort is aimed at discouraging the young from taking up the habit.... The reason for the push may not be hard to find: the World Health Organization estimates that cancer is the leading cause of death in China."[4] In Egypt, where smoking has increased *tenfold* in the last two years, cigarette advertising has been banned from television and smoking has been restricted in theaters and on planes. Cairo's English-language newspaper, *The Gazette*, angrily observes, "The tobacco industry, like the arms industry, is looking increasingly to the vast Third World for what sensible people would call suckers with a death instinct."[4]

While the tobacco industry here and abroad will not be dissuaded from pushing nicotine in the Third World, the US government can be. Lest anyone be left with the impression that it is only the profit-minded capitalists who are guilty of indirect mass murder through smoking-induced disease, let me remind you that the smoking habit is equally tolerated, supported, and prevalent in the socialist countries. Clearly it is a problem that is not going to be solved by cliches.

It is also clear that the amount of research directed at a solution is pitifully small. The total research budget this fiscal year for the NIDA is $48 million; only $1.7 million of that is going into smoking research.[26] Not only should there be direct allocations to basic and applied research from tobacco revenues, there should also be allocations for prevention programs and treatments. Two bills, now in the Pennsylvania General Assembly, would allocate funds from the sales of cigarettes for such worthwhile programs. One would place a 1 cent per pack tax on cigarettes to be paid to the Pennsylvania Cancer Control and Research Fund.[27] The other would place a 1 cent per pack tax on cigarettes to be paid to the state's Department of Health for grants and low interest loans for the payment of cancer treatment.[28] Let us hope that these bills and others like them will be passed.

I do not deny that I feel strongly about this issue. My father and three of my best friends died of smoking-related diseases. Every one of them would have supported every effort, financial and otherwise, that would assure future generations would be spared the agony of emphysema and other smoking-induced diseases.

At the same time we need to recognize that the smoking problem is a very complicated issue. Simplistic formulas for resolving the complex issues involved are not enough. While I would never support legislation to outlaw cigarette production, there is not adequate moral justification for cigarette production merely because people want it. The tobacco industry has an obligation to help support research that will produce disease-free alternatives for future generations.

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