

Tobacco Addiction



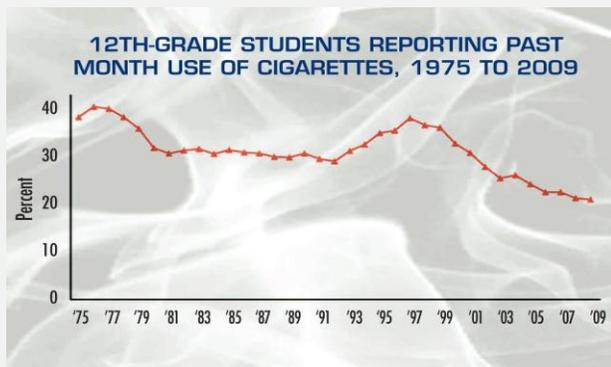
Yesterday

- The world was tallying the smoking-related deaths of more than 75 million people.
- People did not realize that smoking was an addiction and that nicotine was the cause; in fact, cigarette smoking was widely perceived as a glamorous behavior.
- Science was just beginning to understand the connection between cigarette smoking and disease.
- Since 1965, the prevalence of cigarette smoking among United States adults declined by almost half. Without the compelling contributions from research findings, we would have an estimated 80 million smokers in America today rather than 45 million.

Today

- We now know that nicotine is powerfully addictive and that cigarette smoking is the greatest preventable cause of premature death in the United States. In fact, cigarette smoking accounts for 1 out of 5 U.S. deaths, 87% of lung cancer deaths, and at least 30% of all cancer deaths each year. We also know that persons who quit smoking before age 50 reduce by half their risk of dying in the next 15 years.

Cigarette smoking among high school seniors is at its lowest point since NIH began tracking it in 1975



- Results of 3 decades of NIH-supported research have informed high-impact public health education campaigns, which have inspired dramatic reductions in cigarette use (see figure) and in smoking-related disease and death, saving the lives of millions of Americans in the last 30 years.

Tomorrow

- A better understanding of the mechanisms underlying nicotine addiction enabled the development of first-line therapies such as nicotine replacement (e.g., gums and patches). Other medications for smoking cessation—Bupropion (Zyban) and Varenicline (Chantix)—have since been approved as safe and effective by the FDA.
- Behavioral approaches complement most tobacco addiction treatment programs and can prolong effects of medication therapies by teaching people how to recognize high-risk situations, develop alternative strategies, and manage stress.
- Still, significant challenges remain:
 - Relapse rates remain high—75-80% of smokers who try to quit relapse within 6 months.
 - People with mental illnesses/other addictions are particularly vulnerable: they purchase approximately 44 % of all cigarettes sold in the United States. Studies have also shown that as many as 80% of alcoholics and 90% of people with schizophrenia smoke regularly. Many of these individuals will die from smoking-related illnesses.
 - Women who are pregnant continue to smoke. Exposure to nicotine in utero can adversely affect development and increase vulnerability to a variety of negative health effects, including tobacco addiction, later in life. This calls for improved treatments for pregnant women, many of whom also have comorbid mental disorders.

Collective advances will further drive down the incidence and prevalence of tobacco use and nicotine addiction in the United States and set an example for the developing world, where cigarette use is still on the upswing.

- The identification of susceptibility genes for tobacco addiction and associated health effects will allow for the earlier identification of individuals most at risk and will help identify novel targets for medications development. Selected publications:
 - <http://www.drugabuse.gov/newsroom/08/NR4-02a.html>
 - <http://www.nature.com/nature/journal/v452/n7187/full/nature06846.html>
- Treatment strategies that focus on relapse prevention will gain support. One current approach in clinical trials is a vaccine designed to bind and eliminate nicotine from the blood, preventing it from reaching the brain and exerting its effects (<http://www.drugabuse.gov/pdf/news/NR103009.pdf>). Results so far show improved smoking cessation and continuous long-term abstinence (compared to placebo), and decreased use among smokers who did not achieve complete abstinence.
- Research will help us understand the relationship between smoking and mental illness and other addictions, leading to improved approaches to curtail the problem.
- New technologies (web, PDA, or text-based modalities) will broaden the reach and immediacy of behavioral interventions for smoking cessation, increasing treatment access for millions of smokers annually.



- Advances in pharmacogenomics—understanding how variations in an individual’s genome affect his or her response to a medication—will lead to personalized tobacco cessation strategies that can minimize

adverse reactions and optimize quit success (http://www.molmed.org/pdfstore/021_027.Drgon.00096.PDF).

- The knowledge we have already gathered, if translated into effective public health and prevention campaigns and therapeutic developments, can do much to eradicate tobacco addiction. What is needed now is the will and financial investment to make this a reality.

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**National Institute on Drug Abuse (NIDA) website:
www.drugabuse.gov**