National Institutes of Health

Fact Sheet — *Tobacco Addiction*

Thirty Years Ago

- The world was tallying the smoking-related deaths of more than 75 million people.
- People did not realize that smoking was an addictive behavior and that nicotine was the cause; in fact cigarette smoking was widely perceived as a glamorous behavior.
- Even though evidence that smoking caused various diseases was mounting, there was no understanding of the mechanisms underlying this association.
- Between 1969 and 1980, the risk of premature mortality from smoking doubled in women and continued to rise in men.
- Since 1965, the prevalence of cigarette smoking among U.S. adults declined by almost half, such that we would have 80 million smokers in America today instead of 45 million without science's contributions.

Today

- We now know that nicotine is powerfully addictive and that cigarette smoking is the greatest preventable cause of cancer, accounting for at least 30% of all cancer deaths and 87% of lung cancer deaths. We also know that persons who quit smoking before age 50 reduce by half their risk of dying in the next 15 years compared with continuing smokers.

- Results of three decades of research informed massive public health education campaigns, which inspired dramatic reductions in cigarette use and in smoking-related disease and death. Prevention and publicity efforts are partly responsible for saving the lives of millions of Americans in the last 30 years.
- A better understanding of the mechanisms underlying nicotine addiction enabled the development of first-line therapies such as nicotine replacement.
- Behavioral approaches complement most nicotine addiction treatment programs and can prolong effects of medication therapies.
- Bupropion became available as Zyban for smoking cessation. Research indicates that it is an effective alternative medication.
- We know now that the brain continues to develop into early adulthood, and that exposure to nicotine in utero or during childhood or adolescence may adversely affect brain development and increase vulnerability to drug effects and addiction. This knowledge prompted a renewed emphasis on prevention efforts targeting early tobacco use, and partly underlies the current record low smoking prevalence among teens.
- Breakthrough advances in human genomic science launched searches for genes that influence the risk of nicotine addiction and that can predict responses to treatment.
- Clinical trials showed that a nicotine conjugate vaccine (NicVAX®) — designed to bind and eliminate nicotine from serum — is safe and effective in promoting abstinence in cigarette smokers.

Tomorrow

Collective advances will further drive down the prevalence of tobacco use and nicotine addiction in the U.S. and set an example for the developing world, where the epidemic curve of cigarette use is still on the upswing. If trends continue, 1 billion smoking-related casualties will mark the end of this century.

- *Predictive approaches to nicotine addiction.* The identification of susceptibility genes for nicotine

addiction will allow the targeting of individuals at risk of using and becoming addicted to tobacco products and enable the development of more effective and individualized prevention and treatment approaches.

- *Prevention messages that resonate.* As we understand the interaction between nicotine addiction genes, and environmental and developmental influences, we will be able to tailor prevention interventions to more efficiently counteract risk factors.

- *Protecting people from nicotine addiction.* Nicotine-specific antibodies herald a completely new prevention approach to cigarette smoking and nicotine addiction, especially if administered during periods of vulnerability (i.e., adolescence).

- *Personalized treatment strategies will garner better results.* Significant differences characterize the way in which different people respond to nicotine in their system, which, in turn, influences their likelihood of becoming addicted and their response to treatment.