

Virtual Mentor

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CLINICAL PEARL

Health Effects of Smoking and the Benefits of Quitting

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Smoking is the most important and preventable cause of morbidity and premature mortality in the developed and developing world. The overall smoking rate in the United States has slowly diminished over the past four decades, transforming the habit from a cultural centerpiece to a target of social exclusion. Several states have taken bold action to protect residents from the well-known and extensively documented adverse effects of using tobacco products. Since smoking regulations are a local affair, significant variability exists from state to state, with smoking prevalence rates ranging from a high of nearly 30 percent in Kentucky and West Virginia to lows of below 13 percent in California and 10 percent in Utah [1]. Despite these public health victories, the downward trajectory of smoking rates has leveled off in the past 5 years. In fact, according to the Centers for Disease Control and Prevention (CDC), one in five Americans still lights up regularly. If all states had prevention programs like those in California and Utah, 5 million fewer people would be smoking [1, 2].

However, despite extensive efforts to curb smoking in the United States and parts of the European Union, the cigarette industry is still flourishing in other regions of the globe. Worldwide, between 80,000 and 100,000 kids start smoking *every day*. Approximately one quarter of children alive in the Asian Pacific Region will die from smoking [3]. These sobering numbers are not just the problem of our international neighbors; rather, they directly impact the U.S. health care system, given the rising numbers of immigrants entering the United States each year. The trends in mortality for the six leading causes of death in the United States have been stable or decreasing, save one: chronic obstructive pulmonary disease (COPD).

In data from the years 1970 and 2002, the percentages of death rates for heart disease, stroke, and accidents decreased the most, ranging from 40 to 60 percent reductions. In contrast, death rates for COPD doubled during those years [4]. The legacy of our romanticization of cigarettes throughout most of the twentieth century is catching up to smokers and ex-smokers as they age and manifest more health complications. The skyrocketing COPD rates seen today represent those who picked up the habit decades ago, when cigarette smoking was less regulated. An impact on the rate of COPD is not expected to reflect recent antismoking legislation victories for some time to come.

Consequences of Tobacco Use

Fifty percent of smokers die of a smoking-related disease, and the life expectancy of one in four smokers is reduced by as much as 15-20 years [5]. Before the advent of widespread tobacco use in World War II, lung cancer was rare [6]. So rare, in fact, that doctors were required to report cases of lung cancer to the federal government to help identify the local environmental cause of the condition among an affected population, much like reporting cases of mesothelioma today. Now, it is estimated that over 85 percent of all lung cancer is tobacco-related [5]. While most people recognize that smoking is highly destructive for their lungs, many have yet to come to terms with how smoking affects the rest of the body. Damage to one's skin, mouth, hands, feet, respiratory system, heart, bones, and reproductive system becomes readily evident in long-time smokers [7-9]. Areas of the body damaged by smoking include:

- **Skin:** Poor blood circulation due to chronic vascular insults leads to impaired oxygen delivery to the skin, causing lasting damage to collagen and epithelial tissue. This phenomenon also contributes to poor wound healing, making elective surgeries risky and emergency surgeries dangerous [7].
- **Mouth:** Smoking can contribute to bad breath, mouth and jaw cancer, recurrent pharyngitis, and a reduced sense of taste and smell, as well as stained, yellowed teeth and plaque. Smoking reduces the flow of saliva, which, because saliva cleanses the lining of the mouth and teeth and protects the teeth from decay, promotes infection [7].
- **Hands and feet:** Poor circulation leaves hands and feet chronically poorly perfused and cold. Walking can become painful due to peripheral vascular disease induced by smoking, which can even lead to eventual amputation. The blood vessels in the fingers that hold cigarettes can also become so severely impaired that gangrene can set in and lead to amputation, forcing stubborn smokers to switch to the other hand [7].
- **Respiratory system:** Smoking can lead to lung cancer, chronic bronchitis, continuous shortness of breath due to emphysematous injury in COPD, and persistent cough often with pneumonia [8].
- **Heart:** No organ except for the lungs is more affected by smoking than the heart and its circulation. Cigarette smoking by itself increases the risk of coronary heart disease; a smoker's heart is 2 to 4 times more likely to have coronary artery disease than that of a nonsmoker [5]. When smoking acts with other factors such as diabetes, it greatly increases this risk. Smoking increases blood pressure, decreases exercise tolerance, and increases the blood's tendency to clot [7]. Smoking also increases the risk of recurrent coronary heart disease after bypass surgery and raises the rate of abdominal aortic aneurysms fivefold [8, 9].
- **Bones:** Osteoporosis, spine and hip fractures, and degenerative disc disease can all be directly linked to smoking [7].
- **Reproductive System:** Infertility is often a complication with chronic smokers, both male and female. While smoking lowers the sperm counts and decreases sperm motility in men, women have impaired ovulation and egg function [7]. Maternal smoking is associated with several complications of

pregnancy including abruption placentae, placenta previa, bleeding during pregnancy, premature and prolonged rupture of the membranes, and preterm delivery. Smoking during pregnancy also retards fetal growth and causes an average reduction in birth weight [10]. High levels of nicotine have even been found in cervical mucus contributing to cervical cancer [11].

- Malignancy: In addition to the malignancies mentioned above, smoking also increases the risk of cancers of the throat, esophagus, stomach, pancreas, kidneys, bladder, and colon and acute myeloid leukemia [9, 12-14].

Health Benefits of Smoking Cessation

The potential health benefits of smoking cessation are substantial. Stopping smoking reduces the future risk of tobacco-related diseases, slows the progression of existing tobacco-related disease, and improves life expectancy by an average of 10 years [5]. Quitting can bring immediate health benefits at any age, regardless of how long one has smoked. It is never too late to quit. Within the first 24 hours of quitting, a person's blood pressure, heart rate, and peripheral circulation begin to improve. The carbon monoxide content of the airways within the lung can decrease to normal levels by the end of the first day.

By 48 hours, all nicotine has left the body, and the former smoker's taste and smell are on their way to recovering. After 1 to 3 months, an ex-smoker's lung function may have already improved by as much as 30 percent [7], and, about 6 months later, shortness of breath has significantly improved, and that chronic "smoker's cough" is becoming less of a daily occurrence [15].

One year after cessation, the risk of a heart attack drops to *half that of the risk of smokers*. All else being equal, no other single intervention or modern "miracle drug" can make this claim. The risk of lung cancer falls by 50-60 percent after a decade of abstinence. After 15 years of abstinence, the risk of heart attack and stroke falls to that of people who never smoked [7].

Promoting Smoking Cessation

The medical community has refined hospital discharge protocols for patients who suffered heart attacks by making sure, in general, that they are taking an ACE inhibitor, beta-blocker, aspirin, and statin. However, none of these important inventions come close to the impact that a patient can make on his or her health through smoking cessation. Physicians play an essential role in promoting this point as vigorously as they promote compliance to medical therapy. Tobacco use should be added to a patient's problem list along with hypertension, diabetes, and heart disease. In many clinics, smoking status is just another vital sign that intake nurses record along with temperature, blood pressure, and pulse. Although medical schools traditionally teach medical students to put tobacco use in the "social history" section of a history and physical, it is much more apropos in the "past medical history" section.

The attempt to apply the “3 Ts” (tension, trigger, treatment) model of behavior change proposes that, at a given time, a smoker experiences some degree of motivational tension, which in the presence of a trigger may initiate or enhance quitting [5]. Seventy percent of smokers want to quit, but only 3-7 percent will be successful on their own [16]. Long-term tobacco abstinence is extremely difficult and may require several attempts using multiple cessation strategies before a smoker achieves his or her ultimate goal. The average smoker has tried to quit six to nine times, and the quit rate only reaches 15-30 percent with more effective interventions such as behavioral and pharmacological therapies [16].

It is imperative that physicians continue to work with patients on an ongoing basis to find cessation modalities that work for them. Nicotine replacement therapies (such as the gum, patch or inhaler) and Bupropion increase quit rates 1.5- to 2-fold [17]. Early results with Varenicline are also promising, with quit rates increased 2- to 3-fold over placebo. Bringing in social support systems such as friends and family may be effective as well. It is becoming ever more likely that a combination of factors from the physician’s office, social pressures from loved ones, cultural repudiation of public smoking, and growing statewide restrictions and taxes will ultimately be effective in turning the tide of tobacco smoking.

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