

# Effects of Smoking and Methods of Cessation

By Chetan Kaher

Cigarette smoking is the leading cause of preventable death in the United States. It accounts for almost 500,000 deaths per year, or one in every five deaths. Cigarette smoking contributes to a remarkable number of diseases, including coronary heart disease, stroke, chronic obstructive pulmonary disease, peripheral vascular disease, peptic ulcer disease, and many types of cancer. Of the 46 million smokers in the United States, 34 percent try to quit each year— but less than 10 percent succeed. Tobacco is responsible for 24% of all male deaths and 7% of all female deaths, rising to over 40% in men in some former socialist economies and 17% in women in the USA. The average loss of life for all cigarette smokers was about 8 years and for those whose deaths were attributable to tobacco about 16 years.

## 1.1 Health Effects of Smoking – Why it is important to quit

### Immediate effects

Increase in blood pressure, increase in heart rate, thickening of blood, narrowing of arteries, decrease in skin temperature, increase in respiration, stimulation of the central nervous system, vomiting, diarrhoea.

### Long term effects

High blood pressure, blockage of blood vessels, depletion of vitamin C, reduction in the effectiveness of the immune system, cancer of the mouth, throat, and lungs, cancer of the upper respiratory tract, bronchitis and/or emphysema, stomach ulcers, weight loss, dryness and wrinkling of the skin, production of abnormal sperm in males.

## Physiological Effects

### Respiratory System

Bad breath, cough, sputum production, wheezing, and respiratory infections such as bronchitis and pneumonia. These effects can be reduced, but not entirely reversed, by quitting. Smoking is the principal risk factor for developing COPD—i.e., chronic bronchitis and emphysema. Cigarette smoking is, the major cause of lung cancers of all major histological types.

### Heart and Circulation

Premature coronary heart disease (CHD) is one of the most important medical consequences of smoking. Smoking is a strong risk factor for several types of blood-vessel disease. Smoking causes poor circulation to the legs by narrowing the blood vessels that supply these extremities.

### **Eyes and Vision**

Two recent studies published in the *Journal of the American Medical Association* tracked 50,000 smokers for approximately 12 years. The studies found a two- to threefold increased rate among both smokers and ex-smokers of developing macular degeneration, an irreversible form of blindness. Cataracts (clouding of the lens) are another visual problem associated with cigarette smoking.

### **Mouth and Throat**

Cigarette smoke irritates the eyes, nose, throat, and gums. These tissues respond by thickening and by undergoing cellular changes that can eventually lead to mouth, throat, or esophageal cancer. The nicotine causes blood vessel constriction in the mouth, which prevents normal healing of mouth tissues, thus periodontal disease and tooth loss are also common among smokers. Quitting halves the risk for cancers of the oral cavity and esophagus during the first five years after cessation, but ex-smokers always have an increased risk as compared to the risk in those who have never smoked.

### **Genito-Urinary Tract**

Smoking causes bladder and kidney cancer. It is, in fact, the strongest risk factor known for developing bladder cancer. An ex-smoker's risk of bladder cancer is reduced by one half within a few years after quitting, but a higher risk of developing these cancers remains for decades.

### **Musculoskeletal System**

Smoking is associated with osteoporosis (thinning of the bones due to loss of bone minerals) in women, and with spinal disk disease in both sexes.

### **Reproduction**

Infertility is more common among smokers but is not irreversible. The damage done to smokers' babies during pregnancy often is irreversible, however. Smoking during pregnancy is associated with dire consequences for the baby as a fetus, as a newborn, and even as a child. Miscarriage is two to three times more common in smokers, as are stillbirth due to fetal oxygen deprivation and placental abnormalities induced by the carbon monoxide and nicotine in cigarette smoke. Smokers have a fourfold risk of having a low birthweight baby; such babies are more likely than normal-weight babies to have impaired physical, emotional, and intellectual development and intellectual development. The authors of a 1996 study found that women who smoked during pregnancy were 50 percent more likely to have a

child with mental retardation of unknown cause than were nonsmoking women. Women who smoke have a greater risk of premature detachment of the placenta. Once detachment has occurred, perinatal death rates also increase. This risk increases by 20% with every 1/2 pack of cigarettes smoked. Women who smoke also suffer from more reproductive tract infections, fertility and menstrual disorders, earlier menopause, and problems during pregnancy. Female smoking-related death rates have been rising. It is estimated that by the year 2020, more than 1 million adult females will die from tobacco-related illness.

### **Nicotine and Pregnancy**

Low birth weight, premature birth, greater occurrence of miscarriage and stillbirth, impairment of mental development, impairment of physical development, Sudden Infant Death Syndrome (SIDS), baby has a greater likelihood of being hyperactive. Because nicotine is so addictive, there are withdrawal symptoms that may occur when a person is not using the drug

### **The Skin**

Smoking causes premature facial wrinkling through vasoconstriction of the capillaries of the face (vasoconstriction decreases the flow of oxygen and nutrients to facial skin cells). The effect of this reduced blood flow is visible in deep crow's feet radiating from the corners of the eyes and pale, grayish, wrinkled skin on the cheeks.

### **1.2 Reasons for smoking cessation**

Overall risk of Quitting reduces your risk of dying early by 50% within premature death. 5 years of quitting. After 15 years the risk is the same as if you had never smoked.

Lung Cancer: Quitting reduces your risk of lung cancer by 30-50% after 10 years of abstinence. The longer you stay quit, the lower the risk. Cancer of the Your risk is reduced by 50% within 5 years of quitting.

Esophagus Cervical Cancer: Your risk is substantially lower a few years after quitting.

Coronary Heart Disease: Excess risk of CHD caused by smoking is cut in half one year after quitting. Within 15 years it is the same as the risk of someone who never smoked.

Chronic Obstructive Lung function can improve slightly within a few months Pulmonary Disease of quitting. Your risk of death from COPD goes down with continued abstinence.

### **1.3 Withdrawal symptoms**

Drop in pulse rate, drop in blood pressure, disturbance of sleep, slower reactions, tension, restlessness depression, irritability, constipation, difficulty in concentration, craving for tobacco, increase in weight.

## **2.1 Methods of Cessation**

### **Nicotine Replacement Therapy**

Although not the universal cure that it was thought to be when first introduced, nicotine replacement therapy in the form of both the patch and gum has proved effective. The basic idea is to allow the smoker to break the cigarette habit before attempting to actually get off the nicotine. This separates some of the difficulty of quitting from the physical withdrawal and lets you do it in two stages. Later the dosage is lowered and the smoker is slowly weaned off the nicotine replacement.

#### **The Patch**

The patch works by maintaining a steady level of nicotine in the bloodstream throughout the entire day. For some people who smoke for the "kick" or bolus effect of nicotine, the patch may be less effective as it spreads nicotine delivery out over the day.

The patch is available in strengths: 21mg, 14mg and 7mg/day. The patch is probably not a good option for people who smoke a half pack or less of light cigarettes a day, as the patch itself would actually be an increase in nicotine intake.

What the patch does not do:

It doesn't work equally well for everyone.  
It doesn't eliminate withdrawal symptoms entirely.  
It doesn't give you any more willpower.

What the patch does do:

It does let you concentrate on your habit before breaking the physical addiction.

If you are interested in using the patch it will need to be prescribed by your physician or nurse practitioner.

#### **Specifics on Transdermal Nicotine Therapy (The Patch)**

Dosing:

People who smoke 10-15 cigarettes or more per day may decide to start with the highest dose patch. For lighter smokers, using a lower-level dose patch may work best. Highly addicted smokers may opt for the 24-hour patch to avoid morning cravings. A patch is usually worn for 16 hrs or 24 hrs, depending on the brand. The patch is first applied upon awakening on the quit day. A new patch is applied daily. Do not smoke while using the patch.

Product Strengths:

Patches range in strength from 7 mg - 22 mg of nicotine, depending on the brand, and whether the product uses a single dose regimen, or the 'step down' approach. The 'step down' approach gradually weans the user off therapy over a set number of weeks.

#### Manufacturer's Recommended Treatment Duration:

Manufacturers recommend that the patch be used from a range of 4 weeks – 10 weeks, depending on the product. Treatment for 8 weeks is reasonable for most smokers; studies show 8 weeks is as effective as longer treatment. Tapering the dose after 4 weeks is generally recommended for most smokers. Consult your physician to help you decide an appropriate strategy to meet your needs.

#### Adverse Reactions:

About half of patch users experience mild skin reactions. You can treat skin reactions by rotating patch sites and applying anti-itch creams. Less than 5% of patients have to stop using the patch because of skin reactions. Some people report vivid dreams and sleep disturbances while using the 24-hour patch. If sleep disturbances occur, consider removing the patch at bedtime.

#### Unique Product Contraindications:

People who suffer from severe eczema, allergy to adhesive tape, or other skin diseases which may be exacerbated by the patch, should consider using an alternative therapy.

## **Nicotine Gum**

Nicotine gum is available in two strengths, 2mg and 4mg. It differs from the patch primarily in that it delivers nicotine on demand. Many people find that its unpleasant taste and inconvenience make it difficult to use. For very light smokers, or people who smoke for stimulation it may help.

Nicotine polacrilex, or "gum" is a nicotine containing compound that is designed to slowly release nicotine into the mouth when chewed and placed between the cheek and gum.

Unlike smoke, which passes almost instantaneously into the blood through the linings of the lung, the nicotine in the gum takes several minutes to reach the brain. This makes the "hit" less intense with the gum than with a cigarette.

#### Warnings and Cautions:

The FDA and the manufacturers of nicotine gum warn very strongly against smoking while also using the gum, as it could result in more nicotine in the user's system than they are prepared to handle. While actual cases of this are extremely rare, it is not worth the risk. Since the idea behind using any sort of nicotine replacement therapy is to let you break the smoking habit, continuing to use cigarettes while also using the gum is counter productive.

Remember to treat any nicotine containing product with respect. While both the patch and the gum eliminate most of health risks associated with tobacco use, nicotine itself can cause serious medical problems, including death, if abused.

Most people who use the gum make the mistake of chewing too little or stopping use too early. Make sure that you read the directions inside the pack and follow your doctor's instructions carefully. Using too little of the gum will result in withdrawal symptoms similar to abruptly stopping smoking.

## **Nicotine Inhaler**

### **Dosing:**

The initial dosage is individualized--people may self-dose to the level of nicotine they require. The best effect is achieved by frequent, continuous puffing for 20 minutes. One cartridge will last for 20 minutes of continuous puffing and deliver 4 mg of nicotine; only 2 mg are actually absorbed. This is the equivalent of about 2 cigarettes. The maximum suggested dose is 16 cartridges/day.

### **Product Strengths:**

The nicotine inhaler addresses pharmacological, behavioral & sensory stimuli aspects of smoking. Also, the potential for abuse is no greater than with nicotine gum, since the effects on the user are generally the same.

### **Manufacturer's Recommended Treatment Duration:**

Manufacturers report and research has shown that the most successful quitters use 6-16 cartridges/day for the initial treatment period of 12 weeks, followed by gradual reduction of dose over the next 6-12 weeks. Manufacturers recommend against using the inhaler for longer than 6 months.

### **Adverse Reactions:**

About 40% of users experience mouth and throat irritation. Symptoms usually diminish with regular use. Some people experience upset stomachs with use of the inhaler.

## **Nasal Spray**

### **Dosing:**

User should start with 1-2 doses per hour. A usual single dose is two sprays, one in each nostril. The maximum recommended dose is 5 doses/hour or 40 doses total.

### **Product Strengths:**

The nicotine in nasal spray is concentrated at 10 mg/ml.

### **Manufacturer's Recommended Treatment Duration:**

The manufacturer recommends treatment for up to 8 weeks, then stopping or tapering dose for 4-6 weeks.

### **Adverse Reactions:**

Some nasal spray users experience irritation in the nose and throat, watering eyes, sneezing and cough. These symptoms usually become less severe and more tolerable over time.

### **Contraindications:**

People with asthma, rhinitis, nasal polyps, or sinusitis should not use the nasal spray.

## **Bupropion/Zyban**

### Dosing:

Treatment with bupropion should be initiated while the person is still smoking. Approximately one week of treatment is required to achieve steady blood levels.

Dosing should begin at 150 mg/day given every day for the first 3 days, followed by a dose increase for most people to the recommended dose of 300 mg/day. The maximum recommended dose is 300 mg/day, given as 150 mg twice daily. An interval of at least 8 hours between successive doses is advised. The quit attempt should occur during second week of treatment.

### Product Strengths:

One dose of Zyban is 150 mg.

### Manufacturer's Recommended Treatment Duration:

The manufacturer of Zyban recommends a treatment duration of 7 - 12 weeks.

### Adverse Reactions:

The most common side effects from taking bupropion are dry mouth and insomnia. Also, shakiness and skin rash has been reported. Sleep disturbances can be minimized by avoiding bedtime doses.

### Contraindications:

There are specific conditions that would prohibit the use of bupropion. It is advisable that the user discuss his/her medical history with a physician prior to using this drug. The following conditions of concern are as follows:

seizure disorder

current use of Wellbutrin, Wellbutrin SR or other medications containing bupropion

current or prior diagnosis of bulimia or anorexia nervosa concurrent administration of bupropion and MAO inhibitors (a drug taken by people who suffer from mood disorders)

allergic response to bupropion.