

# Smoking and Diabetes

## Smoking and Risk of Diabetes

- The nicotine in cigarette smoke can raise your blood glucose (sugar) level, which can lead to insulin resistance (a pre-diabetic condition where glucose levels are above normal).<sup>1</sup>
- People who never smoked but were exposed to secondhand smoke are also at increased risk for developing glucose intolerance in young adulthood.<sup>1</sup>
- Twelve percent of diabetes cases in the U.S. are attributable to smoking.<sup>2</sup>
- Based on a review of 25 studies, current smokers have a 44% greater chance of developing diabetes than non-smokers. The risk is greatest for heavy smokers.<sup>3</sup>
- Current smokers were 2-3 times more likely than never smokers to develop Type 2 diabetes within five years. The risk was highest (five-fold) among adults who smoked a pack per day for 20 years or more (≥ 20 “pack years”).<sup>4</sup>
- It appears to be a modifiable risk factor: the risk of developing diabetes among former smokers was similar to that of never smokers.

## Smoking, Diabetes and Related Health Problems

Smoking aggravates certain health problems that people with diabetes already face:<sup>3,5,6</sup>

- High blood pressure
- High blood cholesterol levels, which can lead to heart attack and stroke
- Reduced oxygen levels in the blood, which increases risk of heart attack and stroke
- Reduced blood circulation and impaired ability to heal wounds, which can lead to infection
- Difficulty controlling blood glucose levels and managing your diabetes
- Neuropathy or nerve damage (pain, tingling, numbness, weakness), especially in the feet and hands, that can lead to infection and limb amputation
- Impotence
- Kidney disease
- Eye problems (retinopathy) that can lead to impaired vision or blindness
- Periodontal (teeth) problems like bleeding gums and ulcers

## *Smoking and Diabetes*

- Premature death: diabetics who smoke have triple the risk of death from heart disease than non-smokers.
- Increased body fat (especially in the abdomen or stomach area), body inflammation, oxidative stress, and impaired endothelial function.

### Smoking, Pregnancy and Diabetes

- Women who smoked heavily during pregnancy increased by almost five-fold the likelihood of their offspring later developing early adult onset of Type 2 diabetes.<sup>7</sup>

### Benefits of Quitting Smoking

- People with diabetes who quit regain control over their blood glucose levels and achieve better A1c levels over time. Other benefits: less insulin resistance, fewer diabetes complications, better blood circulation, lower blood pressure, lower blood cholesterol levels, and subsequently lower risk for heart disease.<sup>8</sup>
- Former smokers reduce their risk of diabetes to that of never smokers after 5 years for women and after 10 years for men.<sup>9</sup>

### Barriers to Quitting

- Healthcare providers do not frequently ask their diabetic patients if they smoke<sup>9</sup> nor advise them to quit.<sup>10</sup>
- Patients think that quitting smoking is less important than avoiding certain foods or limiting intake of alcohol.<sup>11</sup>
- Because smoking suppresses appetite for some, people with diabetes may view smoking as a strategy for controlling their weight and better managing their diabetes. People with diabetes are concerned about possible weight gain associated with quitting.<sup>12</sup>
- People with diabetes are at greater risk for depression.<sup>13</sup> Because nicotine is a mood-altering drug (acts as a sedative and alleviates anxiety when it first reaches the brain), smokers with diabetes may be using cigarettes as a way of coping with their depression.

### Diabetes and Smoking in Virginia

- In 2008, 16.4% of adults in Virginia (~ 970,000) currently smoke cigarettes.<sup>14</sup>
- An estimated 470,000 Virginia adults (8% of the population) have been told by a healthcare professional that they have diabetes. Another 283,000 adults (5.2% of the population) have been told that they have pre-diabetes.<sup>14</sup> Other surveys

## Smoking and Diabetes

indicate that a total of 2.4 million Virginians aged 20 years and older have either diabetes or pre-diabetes, whether diagnosed or undiagnosed.<sup>15</sup>

- An estimated 128,500 adults with either diagnosed diabetes or pre-diabetes smoke. The smoking prevalence rate is 18.6% for adults with diabetes and 14.9% for adults with pre-diabetes.<sup>14</sup>
- Adults who are poor, less educated, of a racial or ethnic minority group (e.g., Native American), or aged 20-55 years - some of the groups that tend to have higher smoking rates -- also have high diabetes prevalence rates.<sup>14</sup>

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<sup>1</sup> Houston TK, Person SD, Pletcher MJ, Liu K, Iribarren C, Kiefe CI. [Active and passive smoking and development of glucose intolerance among young adults in a prospective cohort: CARDIA study.](#) *BMJ* 2006 (June 3); 332(7549): 1064-1069.

<sup>2</sup> Ding EL, Hu FB. [Smoking and Type 2 diabetes](#) (editorial). *JAMA* 2007; 298(22): 2675-76.

<sup>3</sup> Willi C, et al. [Active smoking and the risk of Type 2 diabetes.](#) *JAMA* 2007; 298(22): 2654-64;

<sup>4</sup> Foy CG, Bell FA, Farmer DR, Goff DC, Wagenknecht LE. [Smoking and incidence of diabetes among U.S. adults.](#) *Diabetes Care* 2005 (October); 28(10): 2501-2507. Assuming 20 cigarettes in a pack, a "pack-year" is defined as the number of cigarettes smoked daily divided by 20 (assuming 20 cigarettes per pack) and multiplied by the number of years smoked.

<sup>5</sup> American Diabetes Association (ADA; <http://www.diabetes.org/>), "Smoking" fact sheet (accessed June 30, 2009).

<sup>6</sup> Haire-Joshu D, Glasgow RE, Tibbs TL. [Smoking and diabetes.](#) *Diabetes Care* 1999 (November); 22(11): 1887-1898.

<sup>7</sup> Montgomery SM, Ekblom A. [Smoking during pregnancy and diabetes mellitus in a British longitudinal birth cohort.](#) *British Medical Journal* 2002; 324: 26-27.

<sup>8</sup> Will JC, Galuska DA, Ford ES, Mokdad A, Calle EE. [Cigarette smoking and diabetes mellitus: Evidence of a positive association from a large prospective cohort study.](#) *International Journal of Epidemiology* 2001; 30: 540-546.

<sup>9</sup> Robinson M, Laurent S, Little JJ. Including smoking status as a new vital sign: It works. *Journal of Family Practice* 1995; 40: 556-563.

<sup>10</sup> Centers for Disease Control and Prevention. [Physician and other health care professional counseling of smokers to quit—United States, 1991.](#) *MMWR* 1993; 42(44): 854-857.

<sup>11</sup> Glasgow R, Hampson S., Strycker L, Ruggiero L. Personal-model beliefs and social-environmental barriers related to diabetes self-management. *Diabetes Care* 1997; 20: 556-561.

<sup>12</sup> Haire-Joshu D, Heady S, Thomas L, Schechtman K, Fisher EB Jr. Beliefs about smoking and diabetes care. *Diabetes Education* 1994; 20: 410-415.

<sup>13</sup> Lustman P, Griffith L, Gavard J, Clouse R. Depression in adults with diabetes. *Diabetes Care* 1992; 15: 1631-1639.

<sup>14</sup> Virginia Behavioral Risk Factor Surveillance System, 2008. Percentages are weighted.

<sup>15</sup> CDC, National Center for Health Statistics, *National Health and Nutrition Examination Survey (NHANES)*, 2005-2006.