



Diabetes and Environmental Hazards

Information for Older Adults and Their Caregivers

If you've been diagnosed with diabetes or metabolic syndrome, a precursor to diabetes and cardiovascular disease, you may be more vulnerable to environmental hazards, such as air pollution and extreme heat.

Did you know that 1 out of every 5 Americans over the age of 60 has diabetes? More than 60 million people in the United States (U.S.) suffer from diabetes or metabolic syndrome^{1,2}, a precursor to diabetes and cardiovascular disease (heart disease and stroke). A study shows that as the rates of diabetes have risen in the U.S., as has the proportion of cardiovascular disease linked to diabetes³. Diabetes is among the top ten leading causes of death in the U.S. for men and women over 65 years of age⁴ and costs our nation more than \$132 billion annually¹.

Diabetes occurs when the body fails to make insulin, a hormone

produced in the pancreas. It also occurs when the body does not properly respond to insulin. The exact cause of the disease is unknown, although genetics and lifestyle factors, such as obesity and lack of exercise, appear to be involved. There are two types of diabetes: Type 1, an autoimmune disease that limits insulin production and typically appears in childhood; and Type 2, which affects more than 90% of those with diabetes, occurs later in life and is caused primarily by inactivity and obesity.

Diabetes carries an increased risk for heart attack, stroke and complications related to poor circulation. It can result in long-term health problems that affect almost every part of the body. Blindness, heart and blood vessel disease, stroke, kidney failure, amputations and nerve damage are some of the complications resulting from diabetes. Exposure to environmental hazards, such as air pollution and extreme heat can worsen the health of persons living with diabetes.

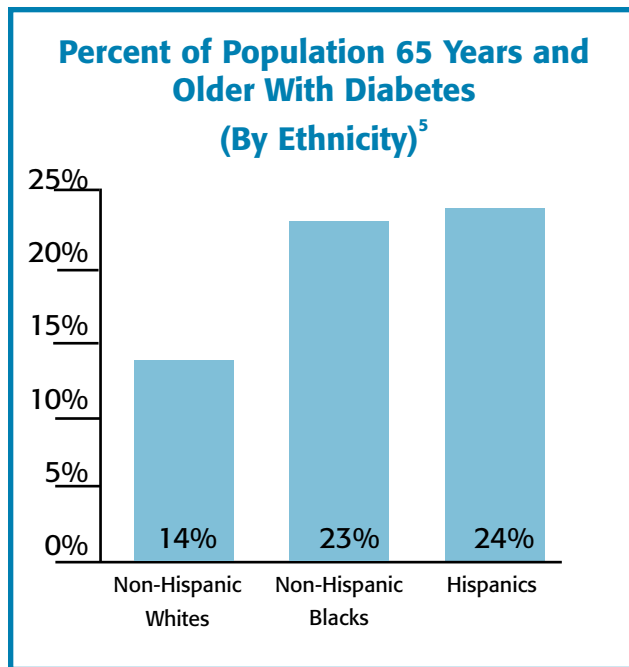
This fact sheet summarizes how environmental factors can affect

- Approximately 20 million U.S. residents have diabetes.¹
- About 47 million people in the U.S. have metabolic syndrome, a pre-diabetes condition.²

the health of older adults who are living with diabetes and suggests how to minimize exposure to air pollution and extreme heat.

Diabetes is More Common Among Minorities

Among persons age 65 and older, 20% of U.S. men and 15% of women report having diabetes. Diabetes occurs more often in African Americans; Native Americans; some Asian Americans, Native Hawaiians and other Pacific Islander Americans; and Hispanics. Non-Hispanic blacks report significantly higher levels of diabetes, compared with non-Hispanic whites (23% compared to 14%). Hispanics also report higher levels of diabetes than non-Hispanic whites (24% compared to 14%)⁵. In 2001, diabetes was the 5th leading cause of death for Native American and Hispanic women and the 6th leading cause of death for Native American and Hispanic men.



Environmental Factors Can Affect the Health of Persons Living with Diabetes

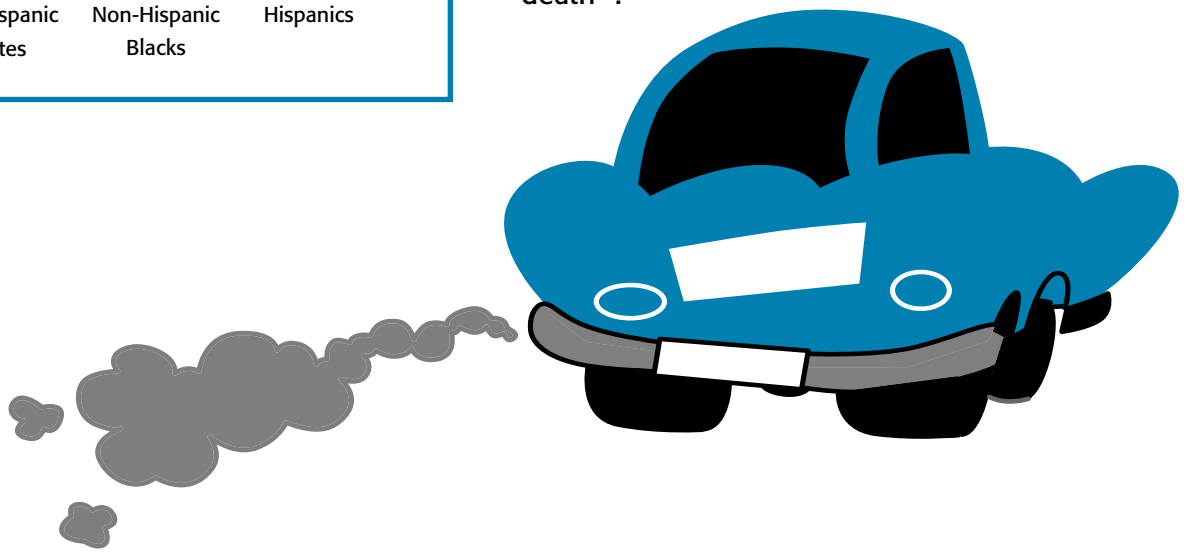
Air Quality

People living with diabetes are considered at high risk for adverse health effects from exposure to harmful particles, or air pollution found both indoors and outdoors. Breathing in harmful particles from air pollutants (for example, smoke, vehicle exhaust, industrial emissions and haze from burning fossil fuels) may increase your risk of heart attack and stroke.

A recent study found that in adults living with diabetes the ability of their blood vessels to control blood flow was decreased on days with high levels of particles from traffic and coal-burning power plants. Decreased blood flow has been associated with an increased risk of heart attack, stroke and other heart problems. Other studies have shown that when air pollution levels are high, people with diabetes have higher rates of hospitalization and death related to cardiovascular problems^{6,7}.

Extreme Heat

Exposure to temperatures above 90 degrees Fahrenheit can be very dangerous, especially when humidity is also high. Having diabetes can make it more difficult for your body to regulate its temperature⁹ during extreme heat. If you're living with diabetes, you should take precautions during periods of extreme heat. Avoiding exposure to extreme temperatures is the best defense. Air-conditioning is one of the best ways to protect against heat-related illness and death¹⁰.



What Can You Do to Minimize Exposure to Environmental Hazards?

LIMIT CONTACT WITH ENVIRONMENTAL FACTORS

■ **Reduce exposure to traffic and outdoor air pollution**

Pay attention to Air Quality Index (AQI) forecasts to learn when the air is unhealthy for sensitive groups. Check with your healthcare provider about lowering your activity level when the AQI is high. If there is smoke outside of your home from forest or other types of fires, or if you live in a multi-family building and there is cooking smoke or fumes in the building, put your air conditioning on the re-circulate mode and keep windows closed until the smoke has cleared. Reduce your time in traffic. Avoid physical activity. Limit exercise near busy roads.

■ **Keep smoke out of indoor spaces**

Avoid tobacco smoke. When you can, ask smokers to smoke outdoors. Choose smoke-free restaurants, bars and other public places. Properly vent wood-burning stoves and fireplaces.

■ **Use caution when working around the house**

If you plan indoor painting activities, schedule it when windows and doors can be left open and use fans to ventilate the area. Take frequent fresh-air breaks; avoid painted rooms for several days.

Before renovating a home built before 1978, take precautions to avoid lead paint exposure. Do not use a belt-sander, propane torch, heat gun, dry scraper or dry sandpaper to remove lead-based paint. These generate unacceptable amounts of lead dust and fumes.

■ **Protect yourself during periods of extreme heat**

Use your air-conditioner or go to air-conditioned buildings in your community. Take a cool shower or bath. Wear lightweight, light-colored and loose-fitting clothing. Ask your doctor or nurse if your medications increase your susceptibility to heat-related illness.

Drink lots of fluids, but avoid beverages containing caffeine or alcohol. These drinks can cause dehydration and increase your carbohydrate load.

If a doctor limits your fluid intake, be sure to ask how much you should be drinking during extreme heat events.

EPA's Aging Initiative is working to protect the health of older adults from environmental hazards through risk management and prevention strategies, education, and research. For more information about EPA's Aging Initiative, visit www.epa.gov/aging.

Additional Resources:

■ U.S. EPA

Indoor Air Quality: www.epa.gov/iaq/

Air Quality Index: www.epa.gov/airnow

■ Centers for Disease Control and Prevention: <http://www.cdc.gov/diabetes/>

■ National Institute of Diabetes and Digestive and Kidney Diseases: <http://diabetes.niddk.nih.gov/>

■ American Diabetes Association: www.diabetes.org

Endnotes

1 National Institute of Diabetes and Digestive and Kidney Diseases. National Diabetes Statistics fact sheet: general information and national estimates on diabetes in the United States, 2005. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, 2005.

2 Ford ES, Giles WH, Dietz WH. Prevalence of the metabolic syndrome among US adults: findings from the Third National Health and Nutrition Examination Survey. *JAMA* 2002; 287(3): 356-9.

3 Fox CS, Coady S, Sorlie PD, D'Agostino RB Sr, Pencina MJ, Vasan RS, Meigs JB, Levy D, Savage PJ. Increasing cardiovascular disease burden due to diabetes mellitus. *Circulation* 2007; 115(12): 1544-50.

4 Federal Interagency Forum on Aging-Related Statistics. Older Americans Update 2006: Key

Indicators of Well-Being. Washington, DC. U.S. Governmental Printing Office. May 2006.

5 Federal Interagency Forum on Aging-Related Statistics. Older Americans 2004: Key Indicators of Well-Being. Washington, DC. U.S. Governmental Printing Office. November 2004.

6 Goldberg MS, Burnett RT, Bailar JC 3rd, Brook J, Bonvalot Y, Tamblyn R, Singh R, Valois MF, Vincent R. The association between daily mortality and ambient air particle pollution in Montreal, Quebec, 2: cause-specific mortality. *Environ Res*. 2001; 86(1): 26-36.

7 Zanobetti A, Schwartz J. Cardiovascular damage by airborne particles: are diabetics more susceptible? *Epidemiology* 2002; 13(5): 588-92.

8 Naumova EN, Egorov AI, Morris RD, Griffiths JK. The elderly and waterborne *Cryptosporidium* infection: gastroenteritis hospitalization before and during the 1993 Milwaukee outbreak. *Emerging Infectious Diseases* 2004; 9(4): 418-25.

9 USEPA. Excessive Heat Events Guidebook. Office of Atmospheric Programs (6207J). Washington, DC. EPA 430-B-06-006. June 2006.

10 Naughton MP, Henderson A, Mirabelli MC, Kaiser R, Wilhelm JL, Kieszak SM, Rubin CH, McGeehin MA. Heat-related mortality during a 1999 heat wave in Chicago. *Am J Prev Med*. 2002; 22(4): 328-9.



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