

# Air pollution connected with narrowing of the arteries

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People living in areas with more air pollution face a greater risk of carotid artery stenosis, a narrowing of the arteries that supply blood to the brain, according to research scheduled for presentation at the American College of Cardiology's 64th Annual Scientific Session in San Diego. Carotid artery stenosis, which results when fatty substances build up in the arteries in the neck, is associated with more than half of the strokes that occur in the United States each year.

Several recent studies have linked [air pollution](#) with cardiovascular problems, but most have focused on effects in the heart and surrounding arteries. This new study is the first to examine effects in the arteries in the head and neck, shedding light on how air pollution might increase the risk of strokes that deprive the brain of oxygen. Such strokes are among the leading causes of death in the United States.

"Our study adds to the growing body of evidence that air pollution is a significant risk factor for cardiovascular disease," said Jonathan D. Newman, M.D., M.P.H., a cardiologist at NYU Langone Medical Center and the study's lead author. "It shows that a person's [cardiovascular risk](#) is not only associated with their genes, health behaviors and lifestyle choices, it also depends to some extent on the world we live in and the air we breathe."

The study is based on an analysis of cardiovascular screening tests from more than 300,000 people living in New York, New Jersey and Connecticut. The screening tests were provided by the Life Line

Vascular Screening program, a voluntary, self-pay program that assesses the health of participants' hearts and arteries using cardiovascular ultrasounds and other tests. The researchers examined the relationship between [carotid artery stenosis](#) and the levels of air pollution in each person's home ZIP code based on air quality measurements collected by the U.S. Environmental Protection Agency from 2003-2008.

The analysis revealed those living in ZIP codes in the top quartile for air pollution had a 24 percent greater risk of carotid artery stenosis compared to those living in the bottom quartile ZIP codes. The analysis excluded people with known carotid disease and adjusted for age, demographics, medical history and median household income.

The research focused on a type of pollution known as fine particulate matter, defined as particles of pollution smaller than 2.5 micrometers in diameter. Fine particulate matter is the most common form of air pollution and stems largely from combustion-related sources, such as car exhaust and the burning of coal or wood.

"The results draw attention to the importance of strategies to reduce air pollution," Newman said. "If you're in good health, the level of air pollution we see in most parts of the United States probably doesn't pose a significant health risk to you. But for people who are very young, very old or have other medical problems, air pollution could be a significant source of [cardiovascular disease risk](#)."

The findings also point to air pollution as one potential factor that could help explain why some people, such as those with diabetes, seem to be more susceptible to [cardiovascular problems](#) than others.

"People with other [cardiovascular risk factors](#) would be wise to limit the amount of time spent outdoors on days when [air pollution levels](#) are high," Newman said.

Indoor and outdoor air pollution is linked with about eight million premature deaths from respiratory and other diseases each year worldwide, according to the World Health Organization. Air pollution imposes the most severe disease burden in developing countries, where open fires are commonly used for heating and cooking.

Newman suggested future research directions could include broadening the analysis to include more of the Life Line screening program's 3.5 million participants nationwide. Studying the biological mechanisms by which air pollution might increase [carotid artery](#) stenosis could also help elucidate the role of air pollution in strokes and other forms of [cardiovascular disease](#).

This study will be simultaneously published online in the *Journal of the American College of Cardiology* at the time of presentation.

The study, "Particulate Air Pollution and Carotid Artery Stenosis," will be presented on March 16 at the American College of Cardiology's 64th Annual Scientific Session in San Diego. The meeting runs March 14-16.

**More information:** Newman will present the study, "Particulate Air Pollution and Carotid Artery Stenosis," on Monday, March 16 at 9:45 a.m. PT/12:45 p.m. ET/4:45 p.m. UTC in Hall B1.

Provided by American College of Cardiology

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