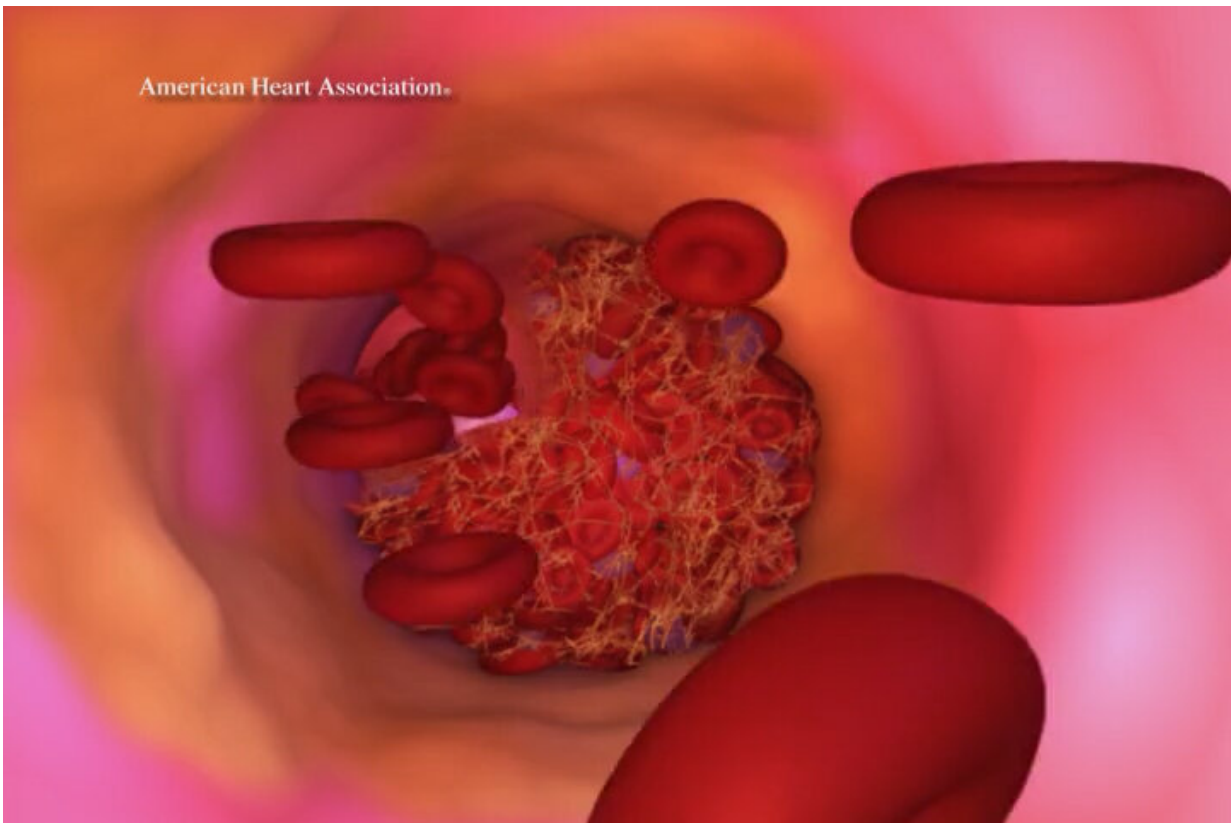


Persistent asthma linked to increased buildup of plaque in arteries leading to the brain

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Atherosclerosis blockage forming graphic. Credit: American Heart Association

Adults with persistent asthma may be at increased risk of heart attack or stroke because of excess plaque buildup in the carotid arteries, according to new research published today in the *Journal of the American Heart*

Association, an open access, peer-reviewed journal of the American Heart Association. People in the study had more plaque buildup in the carotid arteries, large arteries on the left and right side of the neck that carry blood to the brain, compared to people without asthma.

Asthma is a respiratory condition that causes a person's airways to become inflamed—often due to allergic reactions—making it difficult to breathe. Chronic inflammation over time is known to contribute to artery [plaque buildup](#) known as atherosclerosis and is associated with a higher risk of plaques rupturing, triggering a heart attack or stroke.

"Many physicians and patients don't realize that asthmatic airway inflammation may affect the arteries, so for people with [persistent asthma](#), addressing [risk factors](#) for cardiovascular disease may be really helpful," said lead study author Matthew C. Tattersall, D.O., M.S., assistant professor in the department of medicine at the University of Wisconsin in Madison. "The presence and burden of [carotid artery plaque](#) is a strong predictor of future cardiovascular events."

For this analysis, researchers used data from participants enrolled in the Multi-Ethnic Study of Atherosclerosis (MESA) study to examine the potential association between [asthma](#) and carotid artery plaque. MESA is a research study of nearly 7,000 adults that began in 2000 and is still following participants today in six locations across the United States: Baltimore; Chicago; New York; Los Angeles County, California; Forsyth County, North Carolina; and St. Paul, Minnesota. At the time of enrollment, all participants in MESA were free from cardiovascular disease.

The researchers reviewed health data for 5,029 adults, average age of 61, who had baseline risk factors for cardiovascular disease and for whom there was carotid ultrasound data. The participant group is diverse: 26% of adults self-identified as African American, 23% self-identified as

Hispanic and 12% self-identified as Chinese. Additionally, more than half of the group (53%) was female.

The participants in this analysis's cohort were categorized as having persistent asthma, intermittent asthma or not having asthma. The subgroup with persistent asthma, defined as using daily controller medications to control asthma symptoms, consisted of 109 participants; the subgroup with intermittent asthma, defined as a history of asthma, but not using daily medications to control asthma symptoms, consisted of 388 participants; and the remaining participants did not have asthma.

At the start of the MESA study, all participants had an ultrasound of the left and right carotid arteries to identify any carotid artery plaque. The total plaque score defined the number of plaques in the walls of both carotid arteries. Blood levels of inflammatory biomarkers interleukin-6 (IL-6) and C-reactive protein (CRP) were also measured at the start of the MESA study.

The analysis found:

- Carotid plaque was present in 67% of participants with persistent asthma and 49.5% of those with intermittent asthma. Those with persistent asthma had an average of two carotid plaques, and those with intermittent asthma about one carotid plaque.
- Carotid plaque was present in 50.5% of the participants without asthma, with an average of about one carotid plaque.
- After adjusting for age, sex, race, weight, other [health conditions](#), prescription medication use and smoking, participants with persistent asthma had nearly twice as high odds of having plaque in their carotid arteries than those without asthma.

When compared to participants without asthma, those with persistent asthma had higher levels of inflammatory biomarkers. (Individuals with

persistent asthma had an average IL-6 level of 1.89 pg/mL, while those free from asthma had an average IL-6 level of 1.52 pg/mL.) The researchers found that accounting for IL-6 and CRP in the fully adjusted analysis did not reduce the association between persistent asthma and carotid artery plaque.

"This analysis tells us that the increased risk for carotid plaques among people with persistent asthma is probably affected by multiple factors," Tattersall said. "Participants who have persistent asthma had elevated levels of inflammation in their blood, even though their asthma was treated with medication, which highlights the inflammatory features of asthma. We know that higher levels of inflammation lead to negative effects on the cardiovascular system."

In 2019, the American Heart Association released [guidelines](#) for primary prevention of cardiovascular disease included inflammatory disorders such as arthritis and lupus as cardiovascular risk-enhancing factors. This study adds to the understanding of the impact of inflammatory diseases on cardiovascular health.

"The most important message from our findings is that more significant forms of asthma are associated with more cardiovascular disease and cardiovascular events," Tattersall said. "Addressing cardiovascular risk factors through lifestyle and behavior adjustments can be a powerful preventive tool for patients with more severe forms of asthma."

Everyone can improve their cardiovascular health by following the [American Heart Association's Life's Essential 8](#): eating [healthy food](#), being physically active, not smoking, getting enough sleep, maintaining a healthy weight, and controlling cholesterol, blood sugar and blood pressure levels. [Cardiovascular disease claims](#) more lives each year in the U.S. than all forms of cancer and chronic lower respiratory disease combined, according to the American Heart Association.

The study's main limitation is that it was observational since it is analysis of data, therefore, the findings indicate an association between asthma and increased [cardiovascular disease](#) risk, not cause and effect.

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More information: Matthew C. Tattersall et al, Persistent Asthma Is Associated With Carotid Plaque in MESA, *Journal of the American Heart Association* (2022). [DOI: 10.1161/JAHA.122.026644](https://doi.org/10.1161/JAHA.122.026644)

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