

Irregular sleeping habits may increase risk of atherosclerosis in older adults

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Sleeping an inconsistent number of hours each night and falling asleep at different times may increase the risk of developing atherosclerosis among adults older than 45 compared to people with more consistent sleep habits, according to new research published today in the *Journal of the American Heart Association*.

Atherosclerosis is the buildup of fatty deposits, known as plaque, on the [artery walls](#). The plaque can cause arteries to narrow, reducing [blood flow](#) and the amount of oxygen and other nutrients reaching the body. Or the plaque may burst and create a blood clot that blocks the artery, which could lead to a [heart attack](#) or stroke, according to American Heart Association health information.

"This study is one of the first investigations to provide evidence of a connection between irregular sleep duration and irregular sleep timing and atherosclerosis," said study lead author Kelsie Full, Ph.D., M.P.H., an assistant professor of medicine in the division of epidemiology at Vanderbilt University Medical Center in Nashville, Tennessee.

The analysis included more than 2,000 adults, average age 69 years old. Just over half of the participants were women, 38% self-identified as white adults, 28% as Black or African American adults, 23% as Hispanic American adults and 11% as Chinese American adults. Participants were drawn from the Multi-Ethnic Study of Atherosclerosis (MESA), which included men and women ages 45-84, free of clinical cardiovascular disease recruited in six U.S. communities: St. Paul, Minnesota; Baltimore City and Baltimore County, Maryland; Chicago; Forsyth County, North Carolina; Los Angeles County, California; Northern Manhattan and the Bronx, New York.

Between 2010 and 2013, the participants wore a wrist device that detected when they were asleep and awake, and they also completed a sleep diary for seven consecutive days. In addition, participants completed a one-night, in-home sleep study to measure [sleep disorders](#) involving breathing, sleep stages, waking after sleep onset and heart rate. Sleep duration was defined as the total amount of time spent in bed fully asleep, while sleep timing was described as the time a person falls asleep each night.

The greatest irregularity in the number of hours participants slept was a variation of more than 2 hours within one week. Those with the greatest irregularity in sleep timing varied the time they fell asleep by more than 90 minutes within one week.

Researchers gauged the presence of plaque in the arteries by measuring: calcified fatty plaque buildup in arteries ([coronary artery calcium](#)); fatty plaque buildup in neck arteries (carotid plaque presence); thickness of the inner two layers of the neck arteries (carotid intima-media thickness); and narrowed peripheral arteries (the ankle brachial index).

Data evaluated also included information from participant health records and questionnaires, such as age, sex, race and ethnicity, education, yearly income, work schedule, smoking status, alcohol consumption, physical activity, body mass index, [blood pressure](#), sleep habits and usual work schedules—night shift vs. day shift, as examples.

The analysis found:

- Participants with irregular sleep durations that varied by more than two hours within a week were 1.4 times more likely to have high coronary artery calcium scores compared to those with more consistent sleep durations within a week. The score measures the amount of calcified plaque in the arteries, which is the main underlying cause of cardiovascular disease events such as heart attacks and strokes.
- Participants with irregular sleep durations that varied by more than two hours within a week were 1.12 times more likely to have carotid plaque and nearly 2 times more likely to have abnormal results from an ankle brachial index—a test of systemic atherosclerosis and stiffness in the blood vessels, comparing blood pressure at the ankle to blood pressure in the arm.

- No associations were found between sleep duration irregularity and abnormal carotid intima-media thickness.
- Participants with more irregular sleep timing, varying more than 90 minutes within a week, were 1.43 times more likely to have high coronary artery calcium scores compared to those with more regular sleep timing, varying 30 minutes or less within a week.
- There was little evidence linking sleep timing irregularity with other cardiovascular disease markers.

"Maintaining regular sleep schedules and decreasing variability in sleep is an easily adjustable lifestyle behavior that can not only help improve sleep, but also help reduce cardiovascular risk for aging adults," Full said.

Poor sleep, including low quality, abnormal quantity and fragmented segments, is linked to heart disease, hypertension, obesity, Type 2 diabetes and other cardiovascular disease conditions. Sleep was recently added to [the American Heart Association's Life's Essential 8](#) key recommendations to improve and maintain optimal cardiovascular health. The Association suggests adults should get 7-9 hours of sleep a night because adequate sleep promotes healing, improves brain function and lowers the risk for chronic diseases.

The cross-sectional nature of the study—the fact that sleep and atherosclerosis were measured at the same time—represents a limitation of the analysis because researchers were not able to assess if greater sleep irregularity causes the development of atherosclerosis. The results, however, are novel and support continued research to better understand sleep irregularity and the development of cardiovascular disease risk, the authors said.

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More information: Sleep Irregularity and Subclinical Markers of Cardiovascular Disease: The Multi-Ethnic Study of Atherosclerosis, *Journal of the American Heart Association* (2023). [DOI: 10.1161/JAHA.122.027361](https://doi.org/10.1161/JAHA.122.027361)

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