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**Media Contacts Below**

## **Secondhand Smoke Linked to Higher Odds of Heart Failure**

*Findings call attention to need for more education and stringent smoke-free policies, especially for vulnerable populations*

**WASHINGTON (May 5, 2021)** — Breathing in secondhand cigarette smoke may leave you more vulnerable to heart failure, a condition where the heart isn't pumping as well as it should and has a hard time meeting the body's needs, according to a study being presented at the American College of Cardiology's 70<sup>th</sup> Annual Scientific Session.

The data showed that nonsmokers with recent exposure to secondhand smoke had a 35% increased odds of developing heart failure compared with those who hadn't been around tobacco. The association between tobacco exposure and heart failure remained, even after controlling for other factors known to heighten the risk for heart failure such as a history of other heart conditions, high cholesterol and diabetes.

While previous studies have demonstrated the impact of secondhand smoke exposure on people with existing heart failure—for example, on outcomes such as mortality, quality of life and exercise tolerance—this is the first to show an association between tobacco exposure and developing heart failure.

“It adds to overwhelming evidence that secondhand smoke is harmful,” said Travis Skipina, MD, resident physician in the department of internal medicine at the Wake Forest School of Medicine and the study's lead author. “[Secondhand smoke] has been associated with stroke and heart attacks, but what really hadn't been reported before was its association with heart failure, which is a very debilitating and costly disease.”

The analysis included 11,219 participants from the U.S. Third National Health and Nutrition Examination (NHANES) survey who reported being nonsmokers. Participants in this NHANES cohort were followed from 1988-1994. They were 48 years old on average, just over half were women (55.9%) and most (70.5%) were white. Nearly 1 out of 5 had evidence of secondhand smoke exposure.

The association of secondhand smoke and heart failure was stronger in men (compared with women) and among those who had reported a prior heart attack or stroke. The findings were similar across other subgroups, including different ethnic/racial groups and individuals with obesity and diabetes.

“For whatever reason, in males, the impact of secondhand smoke appears to be more likely to put them at risk of heart failure,” Skipina said. “Males, in general, tend to get [cardiovascular] disease at a younger age and overall, they were younger, so that may be why they were predisposed.”

Skipina and his colleagues defined secondhand smoke as having a serum cotinine level  $\geq 1$  ng/mL, the recommended cutoff for heavy exposure used by the Centers for Disease Control and Prevention. Serum cotinine is a metabolite of nicotine that is used to measure levels of smoke exposure and usually signifies

that someone has been breathing in tobacco smoke in the environment within the last one to two days (half-life of 18-20 hours). To assess dose-response, cut-off points of serum cotinine  $\geq 3$ ng/mL and  $\geq 6$ ng/mL were also used. Whether someone had heart failure was defined as answering “yes” to the survey question, “Has a doctor ever told you that you have congestive heart failure?”

Because this is a cross sectional study, it only gives a snapshot in time and cannot establish cause and effect. It is also based on an older data set. Still, Skipina said the association of secondhand smoke exposure with prevalent heart failure persisted even in a contemporary comparison of 3,796 participants followed between 2003-2006, which comes after many public smoking efforts had taken effect.

“Even with the decrease in background secondhand smoke exposure, it was still found to have a positive association with heart failure,” Skipina said. “Active and secondhand smoke induces a proinflammatory state, and higher levels of inflammation affects all body tissues, and it can lead to maladaptive changes in the heart structure and damage to the blood vessels.”

More research is needed to unravel the link between secondhand smoke, especially with the advent of vaping, and heart failure. Still, Skipina said the findings are a reminder for people who have heart failure or are at high risk of developing it that “they should be aware that secondhand smoke exposure may play a role.” He notes this is even more relevant for lower income communities and countries where rates of tobacco use are often much higher and stringent health policies are less likely to be in place and/or enforced.

*Skipina will present the study, “Secondhand Smoke is Associated with Prevalent Heart Failure: The Third National Health and Nutrition Examination Survey,” on Sunday, May 16, at 9:45 a.m. ET / 13:45 UTC.*

ACC.21 will take place May 15-17 virtually, bringing together cardiologists and cardiovascular specialists from around the world to share the newest discoveries in treatment and prevention. Follow [@ACCinTouch](#), [@ACCMediaCenter](#) and [#ACC21](#) for the latest news from the meeting.

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