

# Quitting smoking could lead to major changes in gut bacteria

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Quitting smoking leads to major changes in intestinal bacteria, according to new research. But just what the changes mean will need further investigation.

The small pilot study, to be presented during the American Heart Association's Scientific Sessions in Philadelphia, comes in the wake of past research showing a link between bacteria in the gut and cardiovascular health. That past work has shown [smoking](#) is associated with a decrease in diversity in the types of beneficial bacteria living in the gut.

For the new study, researchers looked at 26 people who were trying to quit smoking and analyzed their stool samples at the start of the study and again two weeks and 12 weeks later.

"We concluded that smoking cessation changes the [gut microbiota](#), and I think that's a significant piece of science," said the study's lead author, Dr. Marcus Sublette.

"It's already been established that smoking changes the gut microbiome. What we're adding here is that smoking cessation itself will continue to change the gut microbiome. Then the question of course is, "Is this good? Or is it bad?" We don't know yet."

The study showed improvements in bacterial diversity were associated with reductions in heart rate, systolic blood pressure and C-reactive protein levels, which rise in response to inflammation. It also showed an increase in hemoglobin, the red blood cells that carry oxygen.

"All of those changes are indirect markers of potentially better health," said Sublette, a cardiology fellow at the University of Wisconsin, Madison. "It adds greater fuel to the hypothesis that the gut microbiome is really doing something for cardiovascular disease."

Sublette said researchers also found that people who quit smoking had decreases in some bacteria called firmicutes and increases in others called bacteroides that past studies have shown could be measures for

lower risk for diabetes and obesity.

"It's hard to know exactly yet what that ratio means, because we are very early on in the study of the gut microbiome and cardiovascular disease. But it adds to the overall picture and helps us start to understand this," he said.

The study was limited by its small patient size and its relatively narrow focus, Sublette said. "We are not digging down to the exact species of bacteria. Rather, we're looking at larger proportions or ratios of large groups of bacteria."

Sublette said he plans to do future research in which mice are fed living [bacteria](#) from humans.

"If we give the microbiota of both an ongoing smoker and a successful quitter to a sterile mouse, how does that change their atherosclerotic disease progression?"

Dr. Stanley Hazen, director of the Center for Microbiome & Human Health at the Cleveland Clinic, said the study results "hint at the need to take a global view of one's metabolism, including the gut microbial community within."

Hazen, who was not involved in the research, said "a change in our environmental exposure impacts the host in many different ways, including shifts in the gut microbial community. What changes occur as a result of smoking cessation is an interesting question that remains to be determined."

**More information:** Effects of Smoking Cessation on the Intestinal Microbiota. *Circulation*. [www.ahajournals.org/doi/10.116 ... irc.140.suppl\\_1.9944](http://www.ahajournals.org/doi/10.116/irc.140.suppl_1.9944)

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