

# Obstructive sleep apnea-induced hypertension linked to gut microbiome

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Obstructive sleep apnea increases the risk of hypertension, however the link between apneas and high blood pressure is unknown. So what is the connection? Researchers at Baylor College of Medicine say the answer could be found in the gut.

The findings, appearing in the current edition of *Hypertension*, say a high-fat diet in a rat model of obstructive sleep apnea can cause a gut microbiome imbalance, called dysbiosis, that can induce [hypertension](#).

"Obstructive sleep apnea often doesn't exist alone – usually people with apnea suffer from some other issues such as obesity or diabetes. So we started our research by feeding a [high-fat diet](#) to our rat model and found that they were not becoming obese but they were becoming hypertensive," said Dr. David J. Durgan, instructor of anesthesiology at Baylor and lead author on the study. "What we found instead was that the high fat-diet changes the microbes that are present in the gut."

At this point researchers only noted an association between the two, so they began studying whether the change in the microbes was contributing to the hypertension itself.

Researchers were able to transplant an imbalanced microbiome from a [rat model](#) with hypertension into nonhypertensive rats that were on a normal diet and undergoing apnea. They found that those that received the imbalanced microbiome became hypertensive and those that received healthy microbiomes remained normotensive.

"We showed that what triggered hypertension in those suffering from [sleep apnea](#) was the imbalanced microbiome," said Durgan. "Diet does affect the microbiome, but when we really examined the changes that were occurring in the microbiome, we found that there were changes

due to both diet and apnea itself. So the effects of apnea and diet synergized to result in the hypertension."

Researchers also noted that within the imbalanced microbiome, there was a decrease in the number of bacteria that produce butyrate, a short chain fatty acid that is well known to play an important role in maintaining the integrity of the gut barrier, or the ability of the gut to keep bacteria and toxins from reaching the rest of the body.

"These findings suggest that manipulation of the microbiome as a treatment for [obstructive sleep apnea](#)-induced hypertension should be further explored. That includes looking into how changes in [diet](#) or adding probiotics to increase butyrate might be used as potential treatments," Durgan said.

Provided by Baylor University

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