

Pilot study finds time-restricted eating has benefits for people at risk for diabetes

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Previous studies have looked at employing time-restricted eating (TRE), a form of intermittent fasting, as a way to lose weight and improve health measures such as blood sugar and blood pressure in mice and healthy people. But in a study publishing December 5 in the journal *Cell Metabolism*, researchers for the first time looked at the effects of TRE in people who had been diagnosed with metabolic syndrome and therefore were at a higher risk of diabetes, heart disease, and stroke. The investigators found that when participants restricted their eating to 10 hours or less over a period of 12 weeks, they lost weight and some symptoms of metabolic syndrome improved.

"There has been a lot of discussion about intermittent fasting and what time window people should eat within to get the benefits of this kind of diet," says co-corresponding author Satchidananda Panda, a Professor at the Salk Institute. "Based on what we've observed in mice, a 10-hour time window seems to convey these benefits. At the same time, it's not so restrictive that people can't follow it long-term."

Metabolic syndrome is characterized by having three or more of five specific risk factors: high fasting blood sugar, high blood pressure, high triglyceride levels, low HDL ("good") cholesterol, and abdominal obesity. People with metabolic syndrome are at greatly increased risk of developing more severe health problems, including diabetes, heart disease, and stroke.

"As a preventive cardiologist, I try to work with my patients and encourage them to make lifestyle changes, but it is very hard to get them to make lasting and meaningful changes," says co-corresponding author Pam Taub, a cardiologist and Associate Professor of Medicine at the University of California San Diego School of Medicine. "When someone has been diagnosed with metabolic syndrome, this is a critical window for intervention. Once people become diabetic or are on multiple medications such as insulin, it's very hard to reverse the disease process."

In the study, 19 individuals with metabolic syndrome were recruited to participate in a program of TRE for three months. They were told they could decide what time to eat and how much to eat as long as all food consumption occurred within a 10-hour window. Most of the people in the study were obese and 84% were taking at least one medication, like a statin or antihypertensive.

At the end of the 12 weeks, the participants had an average of a 3% reduction in their weight and body mass index (BMI) and a 3% reduction in abdominal/visceral fat. Many also had reductions in cholesterol and blood pressure and improvements in fasting glucose.

Participants in the study used an app created by Panda called myCircadianClock (mCC) to log the times they ate and also to track their sleep. They also wore activity monitors that measured their sleeping and waking patterns and a glucose monitor that continuously tracked their glucose levels.

"We told people that they could choose when they ate their meals, as long as they remained within the 10-hour window," Panda says. "We found that universally, they chose to eat breakfast later, about two hours after waking, and to eat dinner earlier, about three hours before going to bed." He notes that in addition to the improvements seen in body weight and measures of metabolic syndrome, 70% of the participants also reported an increase in sleep satisfaction or in the amount they slept.

Taub says that the participants, about half of whom were already her patients, also reported generally having more energy, and some were able to have their medications lowered or stopped after completing the study. Overall, they told her that the plan was easier to follow than counting calories or embarking on an exercise program. More than two-thirds of participants continued with TRE for up to a year after the study was over, at least part of the time, she says.

Based on this pilot study, Taub and Panda have already begun a randomized, controlled clinical trial funded by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) to confirm the benefits of TRE in people with metabolic syndrome. They plan to recruit more than 100 participants--half for each arm. They also intend to conduct additional research to look at other physiological responses to TRE, including effects on the mitochondria in skeletal muscle and changes in liver function.

For anyone considering trying TRE, Taub recommends they first consult with a physician. This is especially important for anyone with metabolic syndrome who is already taking medication, she notes. "Any time someone is losing weight, they need to check with their doctor about whether their medications need to be adjusted," she says. "For instance, if a patient is on blood pressure medications and they lose a significant amount of weight their blood pressure medication needs to be lowered."

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Cell Metabolism, Wilkinson et al.: "Ten-hour time-restricted eating reduces weight, blood pressure, and atherogenic lipids in patients with metabolic syndrome" [https://www.cell.com/cell-metabolism/fulltext/S1550-4131\(19\)30611-4](https://www.cell.com/cell-metabolism/fulltext/S1550-4131(19)30611-4)

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