

# Losing weight sooner has best chance to reverse heart damage, mouse study shows

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Johns Hopkins research on obese mice finds that the impact of dieting and losing weight benefits the heart health of the young, but not the older ones

In a study of the impact of weight loss on reversing [heart damage](#) from obesity, Johns Hopkins researchers found that poor heart function in young [obese mice](#) can be reversed when the animals lose weight from a low-calorie diet. However, older mice, who had been obese for a longer period of time, did not regain better heart function after they were on the same low-calorie diet.

"Our research indicates that the longer mice are obese, the greater the risk that their heart damage is irreversible," says Majd AlGhatrif, M.D., the first author of the study and an assistant professor of medicine at the Johns Hopkins University School of Medicine.

"We don't know whether the same principle would apply to humans as well, and if so, what the turning point would be. But the basic message is that losing weight sooner rather than later would be more beneficial," says Lili Barouch, M.D., the senior author of the study and a cardiologist and assistant professor of medicine at the Johns Hopkins University School of Medicine. "It certainly warrants further study to see if the findings would be similar in people," she says.

The results of the study, "Beneficial Cardiac Effects of [Caloric Restriction](#) are Lost with Age in a Murine Model of Obesity," have been

published online ahead print by the *Journal of Cardiovascular Translational Research*.

Barouch says it's well-known that obesity increases the risk of cardiovascular disease in people, and some studies have shown that by cutting calories and [losing weight](#), some of the detrimental effects of obesity on the heart can be reversed. But it has not been clear, she says, whether the duration of obesity in people—or their age— makes a difference in terms of the heart's ability to recover.

To shed light on that issue, the researchers studied the effects of [calorie restriction](#) in two groups of mice, one young and one old. The younger mice were 2 months old (young adults in mice years), while the older mice studied were between 6 and 7 months old (similar to middle age).

All of the mice were genetically engineered to be born without leptin, a hormone that triggers a sense of being full. Leptin deficiency causes overeating and obesity, so whenever food was available, they would overeat. Both groups had evidence of heart damage, including diastolic stiffness, which affects the heart's ability to relax and fill with blood and can lead to heart failure.

Both the young and old mice lost a similar amount of weight on the calorie-restricted diet after four weeks. However, in the younger mice, restricting calories had positive effects on the heart, including a return to normal diastolic function and a reduction in fat deposits in heart cells. In the older mice, [heart function](#) remained impaired even though there was a reduction in oxidative stress that damages the heart.

While the researchers uncovered an age-dependent pathway leading to obesity-related heart dysfunction reversible only in younger animals, Barouch says more study is needed to determine what the findings may mean for altering heart disease in people. In the meantime, she says the

study should encourage people who are obese to try to lose weight as early as possible in order to reduce their risk of [heart](#) disease later on.

Provided by Johns Hopkins University School of Medicine

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