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## **Moderate weight loss in obese people improves heart function**

Obese patients who lost a moderate amount of weight by eating less and exercising more improved their cardiovascular health, says a study at Washington University School of Medicine in St. Louis.

The results of this two-year study, published in the Dec. 15, 2009, issue of the *Journal of the American College of Cardiology*, showed that weight loss led to improvement in four key measures of heart and vascular health. The improvements seen in the study participants included decreased thickness of heart muscle, improved pumping and relaxation functions of the heart and decreased thickness of the carotid artery walls. Heart muscle thickening and impaired pumping and relaxation functions are predictors of heart failure, and increased carotid wall thickness is a predictor of plaque formation.

The researchers studied 60 moderately obese individuals at regular intervals, and 46 people (78 percent) completed the entire two-year follow-up period. The participants ranged in age from 22 to 64 and had BMIs (body mass indexes) of between 30 and 44. During the study, the subjects were instructed to eat low-calorie diets (1,200 to 1,500 calories for women and 1,500 to 1,800 calories for men) and to exercise for about three and a half hours per week, principally walking.

On average, they lost weight for about six months, reaching a maximum loss of nine percent body weight or 22 pounds. Maximum cardiovascular benefit lagged behind weight loss, with the greatest improvement coming six to 12 months after the study began.

Starting at about six months, most participants slowly regained some of their lost weight. At the end of two years, the participants averaged about nine pounds below their initial weight. Even though they regained some weight, after two years they still retained some of the heart and blood vessel benefit they had received.

"Losing 20 or so pounds might seem daunting to some people, but we showed that even a more modest weight loss can yield heart and vascular benefits," says first author Lisa de las Fuentes, M.D., a Washington University heart specialist at Barnes-Jewish Hospital and assistant professor of medicine in the Cardiovascular Division at the School of Medicine. "It's important to realize that you can choose goals that are attainable and work progressively toward them. You don't necessarily need to lose 50 pounds to improve your heart function."

The study participants were randomly assigned to either low-carbohydrate or low-fat diets. Both diet groups experienced similar improvements in heart and vascular measurements. That's reassuring for people who prefer one type of diet over the other, says de las Fuentes.

None of the patients enrolled in the study had clinically evident signs of heart failure, such as shortness of breath, coughing or fluid buildup, and none were taking cholesterol-lowering medications. About a third of them were being treated for high blood pressure.

By using advanced echocardiography and ultrasound imaging to thoroughly characterize cardiovascular health, the researchers were able to show that at the start of the study, the patients had detectable, though modest, heart dysfunction — their hearts were slightly thickened, the contraction and relaxation abilities of their hearts were somewhat abnormal and the walls of their carotid arteries were mildly thickened. Six to 12 months after dietary intervention began, these indicators of heart and vascular function had become significantly healthier, and participants' cholesterol and triglyceride levels also had improved.

"Over time, obesity leads to abnormal thickening of heart muscle because the heart works harder to pump blood throughout the body," de las Fuentes says. "After a while, the hearts of obese people can lose some of their pumping or relaxation ability, leading to heart failure. But our study suggests that by losing weight, people can turn back the clock and regain more youthful heart function."

De las Fuentes indicates the study is unique because it followed patients for such a long time and because researchers used advanced imaging technology to evaluate heart health. In addition, by following patients over two years, the investigators were able to document what happens as weight is regained, showing that improvements in heart and blood vessel health were gradually lost as patients put weight back on.

The study participants generally were not at a weight eligible for bariatric surgeries such as laparoscopic gastric banding or gastric bypass, so it's important that the study demonstrates a

program of diet and exercise to achieve moderate weight loss can improve heart health, de las Fuentes says.

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Other institutions that participated in the diet study were Temple University School of Medicine in Philadelphia and the University of Colorado Health Sciences Center in Denver.

de las Fuentes L, Waggoner AD, Mohammed BS, Stein RI, Miller III BV, Foster GD, Wyatt H, Klein S, Davila-Roman VG. Effect of moderate diet-induced weight loss and weight regain on cardiovascular structure and function. *Journal of the American College of Cardiology*. 2009;54:3276-81.

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