

Exercise with diet improves insulin sensitivity much more than diet alone

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Obese older adults can reduce their chance of developing the metabolic syndrome by losing weight through dieting alone, but adding exercise to a weight loss program has even more benefit, a new study finds. The results, to be presented at The Endocrine Society's 94th Annual Meeting in Houston, show that a combination of diet-induced weight loss and frequent exercise almost doubled the improvement in insulin sensitivity compared with dieting alone.

The metabolic syndrome is a cluster of metabolic problems that raise the risk of Type 2 diabetes and heart disease: abdominal obesity as shown by a large waist circumference, disturbed lipids (low HDL or "good" cholesterol and high triglycerides), [high blood pressure](#) and [high blood glucose](#) (blood sugar). Although it is known that [weight loss](#) can reduce these risk factors, the most appropriate lifestyle treatment for obesity in [older adults](#) has been controversial, said the presenting author, Matthew Bouchonville, MD.

"It was not clear from prior studies in obese elderly adults whether the beneficial effects of diet and exercise are distinct from each other or have additive effects," said Bouchonville, an assistant professor at the University of Mexico Health Sciences Center and the New Mexico Veterans Affairs (VA) Health Care System in Albuquerque.

The researchers investigated the independent and combined effects of diet-induced weight loss and regular exercise in a one-year randomized controlled clinical trial, funded by the National Institute on Aging. They

randomly assigned 107 [obese adults](#) ages 65 and older to one of four groups: weight management using a calorie-restricted diet, exercise (three times a week for 90 minutes each) without dieting, combined dieting with exercise, and controls (no diet or exercise).

The primary outcome analyzed was the degree of change in the [insulin sensitivity](#) index. Insulin sensitivity is the body's ability to successfully clear glucose from the bloodstream and is often impaired in obese people. This index was measured from the oral glucose tolerance test, a blood test for diabetes after the patient drinks a sugary drink.

Other measures obtained included those for the components of the metabolic syndrome as well as C-reactive protein, a measure of inflammation. Research has linked chronic inflammation to diabetes and heart disease.

Ninety-three participants completed the study. In the intention-to-treat analysis of all 107 subjects, the insulin sensitivity index did not improve in the exercise-alone group or the controls. This index did improve on average by 40 percent in the diet group and by 70 percent in the combined diet-exercise group after controlling for relevant covariates, Bouchonville reported.

"This suggests a distinct complementary effect of exercise on diet-induced weight loss," he said.

Weight loss by diet alone also led to improvements in blood pressure and C-reactive protein. Without weight loss, exercise did not result in improvement in these risk factors, Bouchonville said. Other measures that did not improve in the exercise-only group or the controls but did improve in the other two groups included glucose and insulin response to the oral glucose tolerance test (levels of insulin and glucose trended over several time points after the sugar intake), [waist circumference](#),

abdominal visceral (deep belly) fat, triglycerides and adiponectin. Adiponectin is a protein produced in fat cells that improves insulin sensitivity.

Provided by The Endocrine Society

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