

Weight loss improves memory and alters brain activity in overweight women

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Memory improves in older, overweight women after they lose weight by dieting, and their brain activity actually changes in the regions of the brain that are important for memory tasks, a new study finds. The results were presented today at The Endocrine Society's 95th Annual Meeting in San Francisco.

"Our findings suggest that obesity-associated impairments in memory function are reversible, adding incentive for weight loss," said lead author Andreas Pettersson, MD, a PhD student at Umea University, Umea, Sweden.

Previous research has shown that obese people have impaired episodic memory, the memory of events that happen throughout one's life.

Pettersson and co-workers performed their study to determine whether weight loss would improve memory and whether improved memory correlated with changes in relevant [brain activity](#). A special type of brain imaging called [functional magnetic resonance imaging](#) (functional MRI) allowed them to see brain activity while the subjects performed a memory test.

The researchers randomly assigned 20 overweight, postmenopausal women (average age, 61) to one of two healthy [weight loss diets](#) for six months. Nine women used the Paleolithic diet, also called the Caveman diet, which was composed of 30 percent protein; 30 percent carbohydrates, or "carbs"; and 40 percent unsaturated fats. The other 11

women followed the Nordic Nutrition Recommendations of a diet containing 15 percent protein, 55 percent carbs and 30 percent fats.

Before and after the diet, the investigators measured the women's [body mass index](#) (BMI, a measure of weight and height) and body fat composition. They also tested the subjects' episodic memory by instructing them to memorize unknown pairs of faces and names presented on a screen during functional MRI. The name for this process of creating new memory is "encoding." Later, the women again saw the facial images along with three letters. Their [memory retrieval](#) task, during functional MRI, was to indicate the correct letter that corresponded to the first letter of the name linked to the face.

Because the two dietary groups did not differ in body measurements and functional MRI data, their data were combined and analyzed as one group. The group's average BMI decreased from 32.1 before the diet to 29.2 (below the cutoff for obesity) after six months of dieting, and their average weight dropped from 188.9 pounds (85 kilograms) to 171.3 pounds (77.1 kilograms), the authors reported. This study was part of a larger, diet-focused study funded by the Swedish Research Council and the Swedish Heart-Lung Foundation.

Memory performance improved after weight loss, and Pettersson said the brain-activity pattern during memory testing reflected this improvement. After weight loss, brain activity reportedly increased during [memory](#) encoding in the brain regions that are important for identification and matching of faces. In addition, brain activity decreased after weight loss in the regions that are associated with retrieval of episodic memories, which Pettersson said indicates more efficient retrieval.

"The altered brain activity after [weight loss](#) suggests that the brain becomes more active while storing new memories and therefore needs

fewer brain resources to recollect stored information," he said.

Provided by The Endocrine Society

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