

# Brain benefits from weight loss following bariatric surgery

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Weight loss surgery can curb alterations in brain activity associated with obesity and improve cognitive function involved in planning, strategizing and organizing, according to a new study published in the Endocrine Society's *Journal of Clinical Endocrinology & Metabolism (JCEM)*.

Obesity can tax the brain as well as other organs. Obese individuals face a 35 percent higher risk of developing Alzheimer's disease compared to normal weight people.

Bariatric [surgery](#) is used to help people who are dangerously obese lose weight. Bariatric surgery procedures are designed to restrict the amount of food you can eat before you feel full by reducing the stomach's size or limit the absorption of nutrients by removing part of the small intestine from the path food takes through the digestive tract. Some procedures, such as Roux-en-Y gastric bypass (RYBG) surgery, use a combination of these methods. This study was the first to assess brain activity in women before and after [bariatric surgery](#).

"When we studied [obese women](#) prior to bariatric surgery, we found some areas of their brains metabolized sugars at a higher rate than normal weight women," said one of the study's authors, Cintia Cercato, MD, PhD, of the University of São Paulo in São Paulo, Brazil. "In particular, obesity led to altered activity in a part of the brain linked to the development of Alzheimer's disease – the posterior cingulate gyrus. Since bariatric surgery reversed this activity, we suspect the procedure may contribute to a reduced risk of Alzheimer's disease and other forms

of dementia."

The longitudinal study examined the effect of RYBG surgery on the brain function of 17 obese women. Researchers used positron emission tomography (PET) scans and neuropsychological tests to assess brain function and activity in the participants prior to surgery and six months after the procedure. The same tests also were run once on a control group of 16 lean women.

Before they underwent surgery, the obese women had higher rates of metabolism in certain areas of the brain, including the posterior cingulate gyrus. Following surgery, there was no evidence of this exacerbated brain activity. Their brain metabolism rates were comparable to the activity seen in normal weight women.

After surgery, the obese women also performed better on a test measuring executive function – the brain's ability to connect past experience and present action – than they did before the procedures. Executive function is used in planning, organizing and strategizing. Five other neuropsychological tests measuring various aspects of memory and cognitive function showed no change following the surgery.

"Our findings suggest the brain is another organ that benefits from [weight loss](#) induced by surgery," Cercato said. "The increased [brain activity](#) the obese women exhibited before undergoing surgery did not result in improved cognitive performance, which suggests [obesity](#) may force the brain to work harder to achieve the same level of cognition."

**More information:** "Changes in Neuropsychological Tests and Brain Metabolism after Bariatric Surgery," *Journal of Clinical Endocrinology & Metabolism*, 2014.

Provided by The Endocrine Society

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