

Gastric bypass surgery improves blood sugar handling and insulin sensitivity, study finds

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Roux-en-Y, the most common type of gastric bypass surgery, can lead to remission of type 2 diabetes along with weight loss. A new study in the *American Journal of Physiology—Regulatory, Integrative and Comparative Physiology* examines why, finding that insulin sensitivity of the main glucose (sugar) storage sites in the body improve after gastric bypass surgery.

Insulin is the primary hormone responsible for transferring glucose from the blood stream into the body's tissues to be used by the cells or stored. The skeletal muscles and fat tissues are the main glucose storage sites in the body. How readily the body responds to insulin, called [insulin sensitivity](#), indicates how quickly glucose can be transferred out of the blood. Poor insulin sensitivity slows the uptake of glucose into the skeletal muscle and fat tissues and leads to a high blood sugar level. Decreased insulin sensitivity is common in people with obesity and type 2 diabetes.

Abdominal fat and thigh muscle samples were taken from obese patients with type 2 diabetes and obese patients with normal glucose control before and after gastric bypass surgery. All patients showed substantial [weight loss](#) and improved insulin sensitivity by 12 months after surgery. Levels and activities of insulin-controlled proteins increased in both fat and muscle tissues after gastric [bypass surgery](#), changes that enhance insulin sensitivity. Fat tissue from non-diabetic patients showed the most changes compared with diabetic patients, while changes in skeletal muscle were similar.

The data suggest that improved insulin sensitivity in the skeletal muscle and [fat tissue](#) contribute to the improved whole-body insulin action following [gastric bypass](#) surgery. These adaptations were observed only after significant weight loss had

occurred, the research team noted. Interestingly, improvement in insulin sensitivity was associated with changes in fat tissue rather than skeletal muscle, suggesting that fat tissue may play a larger role in insulin sensitivity than currently believed, the team wrote. The study was performed by researchers from the University of Copenhagen in collaboration with Novo Nordisk A/S, Hvidovre Hospital and Aarhus University in Denmark.

The article "Enhanced insulin signaling in human [skeletal muscle](#) and adipose tissue following [gastric bypass surgery](#)" is published in the *American Journal of Physiology—Regulatory, Integrative and Comparative Physiology*. It is highlighted as one of this month's "best of the best" as part of the American Physiological Society's APSselect program.

More information: "Enhanced insulin signaling in human skeletal muscle and adipose tissue following gastric bypass surgery." *American Journal of Physiology—Regulatory, Integrative and Comparative Physiology* Published 1 September 2015 Vol. 309 no. 5, R510-R524 [DOI: 10.1152/ajpregu.00228.2014](#)

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