

# Gastric bypass surgery alters hormones to relieve diabetes symptoms

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–Gastric bypass surgery alters the hormones and amino acids produced during digestion, hinting at the mechanisms through which the surgery eliminates symptoms of type 2 diabetes, according to a recent study accepted for publication in The Endocrine Society's *Journal of Clinical Endocrinology & Metabolism (JCEM)*.

The study simulated pre-operative digestion and compare how the same patient metabolizes nutrients following surgery. In four patients who had catheters inserted into the bypassed portion of the stomach as part of their post-operative care, researchers analyzed the hormones produced when food traveled through the catheter to mimic the pre-operative digestive tract. Researchers compared those findings to the hormonal activity when a meal was digested through the new bypassed route.

Patients' levels of insulin and the hormones glucose-dependent insulinotropic peptide (GIP) and glucagon-like peptide-1 (GLP-1) soared following a meal digested through the new bypassed digestive tract. Branched-chain [amino acids](#) also rose, while free fatty acid levels dropped following gastric [bypass surgery](#). This hormonal activity, particularly spikes in insulin, allowed patients to digest the meal while maintaining better control of their blood sugar.

"The data offer insights into how [gastric bypass](#) surgery works. The surgery is currently the most effective weapon we have to combat morbid obesity and, as a side effect, it has proven to relieve symptoms of [type 2 diabetes](#)," said the study's main author, Nils Wierup, PhD,

associate professor at the Lund University [Diabetes](#) Centre in Sweden. "Exploring the impact this surgery has on digestion could yield new, non-surgical strategies for treating diabetes and obesity."

Researchers analyzed digestion in four female patients who underwent gastric bypass surgery at two Swedish hospitals and had received stomach catheters as part of their post-operative care.

"Unlike past studies that compared digestion before and after surgery, our method eliminated concerns that differences in weight and food intake following the surgery could influence the analysis," Wierup said. "Using this strategy, we were able to prevent confounding factors from affecting the data."

**More information:** The article, "Effects of Ingestion Routes on Hormonal and Metabolic Profiles in Gastric-Bypassed Humans," appears in the May 2013 issue of JCEM.

Provided by The Endocrine Society

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