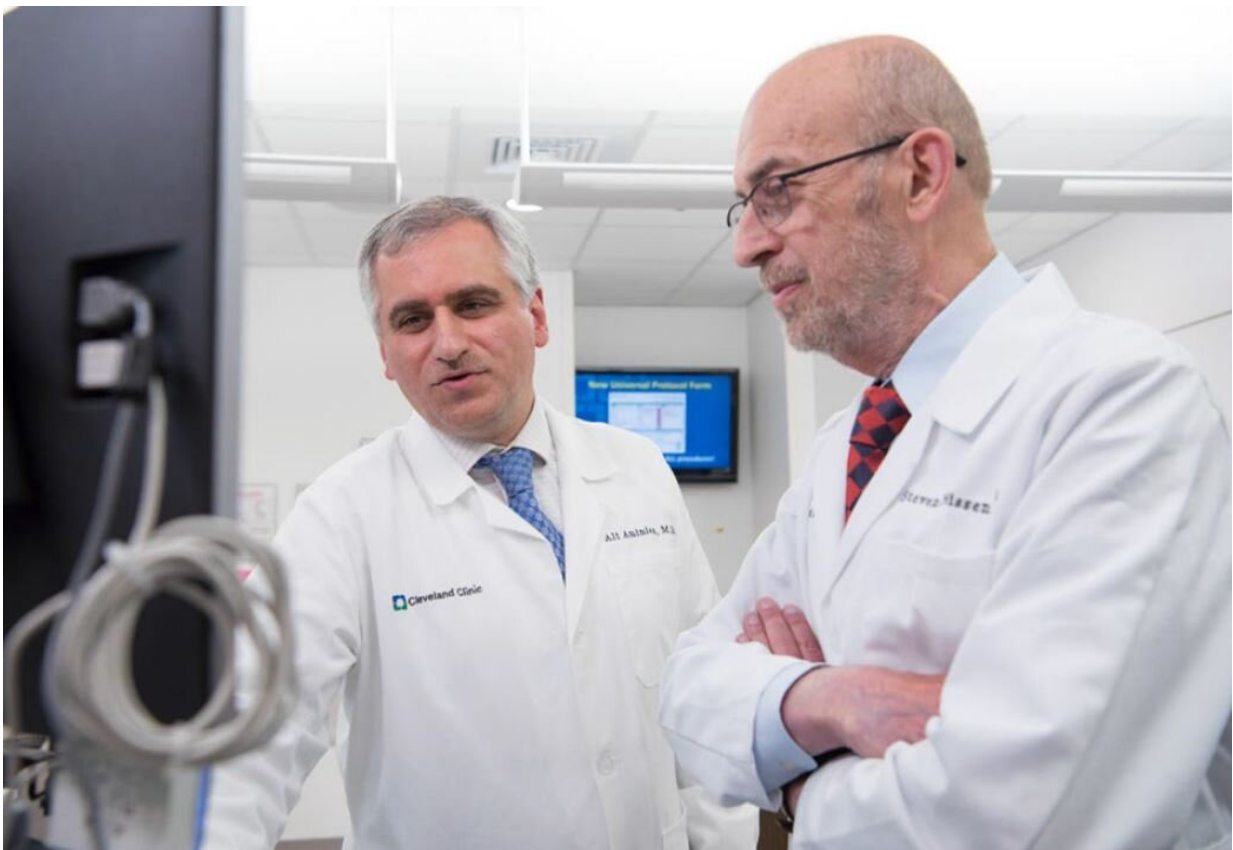


# Cleveland Clinic develops calculator to estimate 10-year risk of diabetes complications

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Ali Aminian, M.D., (left) and Steven Nissen, M.D. Credit: Cleveland Clinic

Patients struggling with type 2 diabetes and obesity are faced with the

decision of whether to receive usual medical care or undergo weight-loss surgery. Now, a new risk calculator developed by Cleveland Clinic researchers can show these patients their risks of developing major health complications over the next 10 years depending on which course of treatment they choose.

The research was presented today as one of the Top 10 studies at the ObesityWeek 2019 international conference in Las Vegas.

Research has shown that [weight-loss surgery](#)—also known as metabolic or bariatric surgery—can help people control their [diabetes](#) and improve cardiovascular health. In 2016, the world's leading diabetes organizations recommended in a [consensus report](#) that metabolic surgery should be a treatment option for people with type 2 diabetes and obesity. However, few eligible patients undergo the surgery.

To help patients and their physicians better predict the health benefits of usual care versus [surgical treatment](#), Ali Aminian, M.D., a bariatric surgeon at Cleveland Clinic, and his research team developed a risk score [calculator](#) that provides personalized evidence-based information, based on a patient's current health status.

"The calculator can be a useful tool for physicians and patients with type 2 diabetes and obesity. It shows a patient's risk of heart disease, stroke, heart failure, diabetic kidney disease, and death over the next 10 years with usual care. It also shows how a patient's risk of those adverse events could change after metabolic surgery," said Dr. Aminian, who is also lead author of the study.

The calculator—10-year Individualized Diabetes Complications Risk Scores—was developed in two phases over the course of about two years. In the first phase, an observational study looked at nearly 2,300 patients who underwent [metabolic surgery](#) and 11,500 matched patients

with similar characteristics who received usual medical care.

The phase 1 results, published in the [\*Journal of the American Medical Association\*](#) (*JAMA*) in September, show that weight-loss surgery performed in patients with type 2 diabetes and obesity is associated with 40 percent lower risk of death and major adverse cardiovascular events than usual medical care. Surgical patients also lost more weight, had better diabetes control, and used fewer medications for treatment of their diabetes and cardiovascular disease than those undergoing usual medical care.

In phase 2, the researchers used the same group of patients to identify predictors for different health outcomes. Evidence-based models were built and integrated into a risk calculator to estimate the likelihood of coronary heart disease, stroke, heart failure, diabetic kidney disease, and mortality over the next 10 years in patients with type 2 diabetes and obesity with and without [bariatric surgery](#)

"Based on the advice of subject matter experts, our team was able to explore 26 risk factors for the different outcomes, including risk of dying, in that large group of patients," said Michael Kattan, Ph.D., chairman of the Department of Quantitative Health Sciences in Cleveland Clinic's Lerner Research Institute. "We then compared [machine learning](#) and traditional statistical techniques to identify the most accurate prediction models for each outcome and built those into the calculator."

Steven Nissen, M.D., Chief Academic Officer of the Heart & Vascular Institute at Cleveland Clinic, added, "Diabetes can be a devastating disease and combined with obesity, patients are at a high risk for cardiovascular complications. Metabolic surgery is an underutilized treatment for these patients. This calculator can help both physicians and patients quantify the risks and benefits of [surgery](#) and make the best

decision for treatment."

The calculator will be accessible on the [Cleveland Clinic Risk Calculator Library website](#) and as a smartphone application (BariatricCalc). The second version of the app with additional calculators will be released during ObesityWeek 2019.

Provided by Cleveland Clinic

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