

Bariatric Surgery to "Treat" Diabetes: Worth the Costs?

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Medical Utilization and Annual Health Care Costs in Patients With Type 2 Diabetes Mellitus Before and After Bariatric Surgery

Makary MA, Clarke JM, Shore AD, et al
Arch Surg. 2010;145:726-731

Cost-Effectiveness of Bariatric Surgery for Severely Obese Adults With Diabetes

Hoerger TJ, Zhang P, Segel JE, Kahn HS, Barker LE, Couper S
Diabetes Care. 2010;33:1933-1939

Study Summary

Two studies with vastly different methodologies suggested that bariatric surgery in patients with type 2 diabetes mellitus is at least cost-effective and may even lead to cost savings.

Makary and colleagues used administrative claims data to study 2235 patients with diabetes aged 18-64 years who had medical and pharmacy insurance coverage for at least 6 months before and 6 months after bariatric surgery. The main outcomes were overall healthcare costs and use of diabetes medications. Costs in the first year, 1-2 years, and 2-3 years after surgery were compared with the costs incurred during the previous year and 1-2 years leading up to the surgery (baseline). The number of diabetes medications was examined at the time of surgery; 3 and 6 months presurgery; and 3, 6, 9, 12, and 24 months following the bariatric procedure.

Compared with the baseline annual cost of \$6376 per person, total annual healthcare costs in the first year after surgery increased 9.7% (\$616), but then decreased 34.2% (\$2179) in year 2 and 70.5% (\$4498) in year 3. Bariatric surgery was associated with complete elimination of diabetes medication use in 1669 of 2235 patients (74.7%) at 6 months, 1489 of 1847 patients (80.6%) at 1 year, and 906 of 1072 patients (84.5%) at 2 years after surgery.

Hoerger and colleagues applied the validated US Centers for Disease Control-Research Triangle Institute (CDC-RTI) Diabetes Cost-Effectiveness Model after modifications to incorporate results of bariatric surgery, such as diabetes remission, relapse from remission, and surgery costs. This Markov model simulates the development of diabetes-related complications (nephropathy, neuropathy, retinopathy, heart disease, and stroke) and death, and estimates costs and quality-adjusted life-years (QALYs) associated with these states. The investigators conducted separate analyses for people with newly diagnosed diabetes (within 5 years) and those with established diabetes (at least 10 years post diagnosis). The model estimated that total lifetime costs were \$15,000-\$20,000 higher for patients who underwent bariatric surgery, but these patients gained 1.34-2.21 QALYs, resulting in a cost-effectiveness ratio of \$7000-\$13,000 per QALY.

Viewpoint

Type 2 diabetes mellitus places an enormous (and growing) economic burden on the US healthcare system,^[1] and the link between obesity and diabetes is indisputable. One of the truly remarkable effects of bariatric surgery is the high rate of resolved diabetes.^[2] However, a chronic problem with studies of bariatric surgery is the inability to assess the long-term benefits because of high attrition rates. For example, Makary and colleagues did not attempt to estimate costs beyond the first 3 years after surgery, and only 12.9% of their initial sample remained available for analysis in the third year. Hoerger and associates addressed this problem with simulated data, thus allowing for complete follow-up. Accounting for relapse of diabetes is an important step that is rarely taken.

These studies add to the mounting evidence that bariatric surgery is a viable treatment alternative for some patients with diabetes. The concern, however, is that patients may get the wrong message. Rather than make much-needed lifestyle changes of improved diet and exercise, patients may opt for the much more invasive but "easier" path of surgery that may not provide the overall benefits that would be achieved with healthy lifestyle choices. Additionally, an important consideration in studies of bariatric surgery is that patients are by definition self-selected; not all patients with diabetes would be good candidates for surgery. For those who are, the cost reductions reported by Makary and associates and the quite favorable cost-benefit ratio reported by Hoerger and associates are enticing. However, bariatric surgery should still be considered a treatment of last resort.

[Abstract](#)

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References

1. American Diabetes Association. Economic costs of diabetes in the U.S. in 2007. *Diabetes Care*. 2008;31:596-615.
2. Buchwald H, Avidor Y, Braunwald E, et al. Bariatric surgery: a systematic review and meta-analysis. *JAMA*. 2004;292:1724-1737.