



ASMBS

American Society for Metabolic & Bariatric Surgery

FACT SHEET
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TYPE 2 DIABETES AND OBESITY: TWIN EPIDEMICS

OVERVIEW

- Type 2 diabetes accounts for 95% of the 25.8 million diabetes cases in the U.S¹
- Obesity is a major independent risk factor for developing the disease, and more than 90% of type 2 diabetics are overweight or obese²
- Modest weight loss, as little as 5% of total body weight, can help to improve type 2 diabetes in patients who are overweight or obese³
- Metabolic and bariatric surgery may result in resolution or improvement of type 2 diabetes independent of weight loss⁴

PREVALENCE

- Diabetes affects 8.3% of the total U.S. population (25.8 million people)⁵
 - 18.8 million people have been diagnosed
 - 7 million people are unaware they suffer from the disease
 - About 95% of the diabetes population has type 2 diabetes⁶
- Increases in type 2 diabetes cases across the country associated with higher obesity rates and rising age of population⁷
 - More than one-third (35.7%) of adults are obese;⁸ rate nearly tripled between 1960-2010⁹
- While children and adolescents are increasingly being diagnosed with type 2 diabetes, the CDC notes it is difficult to estimate the disease's prevalence in this population because it can go undiagnosed for long periods of time^{10,11}
 - The rise in diabetes diagnoses is attributed to increasing childhood obesity rates, which have tripled since the 1980s, with approximately 17% (or 12.5 million) of children aged 2-19 suffering from obesity¹²
- African-Americans and the elderly are disproportionately affected by diabetes¹³
 - 18.7% of all African-Americans over twenty years old have diabetes, compared to 10.2% of whites
 - 26.9% of Americans age 65 and older have diabetes, compared to 11.3% of adults over 20

Pre-diabetes

- About 79 million Americans, or 35% of people 20 or older have pre-diabetes,¹⁴ while half of adults over 65 are affected by the disease¹⁵
 - Up to 70% of patients with pre-diabetes eventually develop diabetes¹⁶
 - People with pre-diabetes are also at risk for heart disease and stroke¹⁷

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HEALTH RISKS OF TYPE 2 DIABETES

- People with diabetes have double the mortality risk of similar-aged people without diabetes, and the disease is the seventh leading cause of death in the U.S.¹⁸
- Diabetes is the leading cause of kidney failure, non-traumatic lower-limb amputations, new cases of blindness among adults, and it is associated with increased risk of:
 - Heart disease and stroke
 - High blood pressure
 - Nervous system disease
 - Kidney disease
 - Blindness
 - Amputations
 - Dental disease
 - Pregnancy complications

IMPACT OF METABOLIC & BARIATRIC SURGERY ON TYPE 2 DIABETES

- Meta-analysis of 22,000 bariatric surgery patients in 136 studies (1990-2003) found bariatric mean excess weight loss was 61.2%, and 86% of patients saw improvement or resolution of type 2 diabetes¹⁹
- Gastric bypass may result in resolution or improvement of type 2 diabetes independent of weight loss by decreasing levels of ghrelin – appetite stimulating hormone secreted by the stomach²⁰
- People with morbid obesity who had gastric bypass surgery significantly reduced long-term mortality from diabetes by 92% and from “any cause” by 40%²¹ (*NEJM*, 2007)

Surgical Treatment vs. Medical Therapy – Comparative Studies

- Meta-analysis of 796 participants in 11 studies comparing metabolic and bariatric surgery to nonsurgical treatment for obesity found surgery results in greater weight loss and higher type 2 diabetes remission rates²² (*BMJ*, 2013)
 - Studies with more than six months follow up showed surgical patients lost an average of 57 more pounds than participants in nonsurgical weight loss programs, and were 22 times more likely to see their type 2 diabetes abate
- Head-to-head studies comparing bariatric surgery to medical therapy found bariatric surgery superior to medical treatment in producing type 2 diabetes remission, even before weight loss
 - Cleveland Clinic study showed within one year, diabetes remission rates with bariatric surgery were about 40% (42% gastric bypass, 37% gastric sleeve) compared to about 12% for patients treated with the best pharmacotherapy available; patients had BMI between 27 and 43²³ (*NEJM*, 2012)
 - Catholic University/New York-Presbyterian/Weill Cornell Medical Center showed remission rates were about 85% for bariatric surgery (75% gastric bypass, 95% biliopancreatic diversion) and zero for medical therapy in patients with BMI greater than 35, after two years²⁴ (*NEJM*, 2012)

§ In surgical groups, both weight loss and preoperative BMI were not predictors of diabetes control, suggesting such surgical procedures may be independent of weight loss

- 73% of gastric band patients with type 2 diabetes experience remission two years after surgery, a 5 times higher resolution rate than those receiving convention therapy²⁵ (*JAMA*, 2008)
 - Conventional therapy includes access to general physician, nurse and diabetes educator and medical therapies including pharmaceutical agents, individual lifestyle modification programs and physical activity
 - Authors note weight regain after surgery may put patients at risk for type 2 diabetes relapse

Long-Term Results of Surgical Treatment

- 24% of patients who have bariatric surgery experience complete, long-term – five years or more – remission of their type 2 diabetes; 26% experience partial remission and 34% improve from baseline²⁶ (*Annals of Surgery*, 2013)
- Six years after surgery, 62% of gastric bypass patients with severe obesity – BMI 35 or higher – experienced type 2 diabetes remission, compared to 6-8% in control groups²⁷ (*JAMA*, 2012)
- Ten years after intervention, 7% of surgery patients have type 2 diabetes, compared to 24% of nonsurgically treated patients²⁸ (*NEJM*, 2004)

Surgery in Patients with Lower BMIs

- Compared to nonsurgical treatments, bariatric surgery for patients with mild-to-moderate obesity – BMIs between 30 and 35 – and type 2 diabetes produces better intermediate glucose outcomes one-to-two years following treatment²⁹ (*JAMA*, 2013)
- For patients with type 2 diabetes and mild-to-moderate obesity, laparoscopic gastric band surgery is a more effective treatment than non-surgical therapy³⁰ (*Annals of Internal Medicine*, 2006)
 - After two years, only 3% of surgical patients continued to have metabolic syndrome, compared to 24% of non-surgical patients, who were treated with very-low-calorie diets, pharmacotherapy and lifestyle change

COSTS ASSOCIATED WITH TYPE 2 DIABETES

- Total costs of diagnosed diabetes rose 41% in five years, from \$174 billion in 2007 to \$245 billion in 2012³¹
- More than 1-in-5 health care dollars in the U.S. are spent on diabetes care with half directly attributable to treatment³²
 - Indirect costs, including absenteeism, reduced work productivity, inability to work and lost workers due to premature death, account for \$68.6 billion
- Diabetes patients incur average medical costs of \$7,900 for treatment; total medical expenses are 2.3 times higher than for people without diabetes³³
- Metabolic surgery has been shown to be associated with reductions in overall health care costs in patients with type 2 diabetes³⁴
 - Annual health care costs decreased 34.2% after two years and by 70.5% after three years
 - Associated with elimination of diabetes medication in nearly 85% of patients two years after surgery

GUIDELINES & RECOMMENDATIONS

- American Diabetes Association recommends bariatric surgery be considered for adults with type 2 diabetes who have a BMI greater than 35, in particular if diabetes or associated comorbidities are difficult to control with lifestyle and pharmacologic therapy³⁵
 - Notes there is “insufficient evidence” for adults with BMI less than 35 outside of a research protocol
- 2011 statement from International Diabetes Federation said surgery was “effective, safe and cost-effective therapy” for patients with obesity and type 2 diabetes, noting it significantly improves glycemic control in severely obese patients with the disease³⁶ (*Diabetes Medicine*, 2011)

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Updated November 2013