



### *PPO Best Practices for Assuring Successful Bariatric Surgery Outcomes Issue Brief*

## **TREATING TYPE 2 DIABETES WITH BARIATRIC SURGERY – AN OVERVIEW FOR PPOS ON OPPORTUNITIES FOR OUTCOME AND ECONOMIC IMPROVEMENTS**

### **INTRODUCTION**

Use of obesity surgery (called bariatric surgery) has increased steadily over the past decade, with over 200,000 surgeries now performed annually.<sup>1</sup> The increased use in surgery tracks with an explosion in the rates of obesity in the U.S. Over 30% of Americans are clinically obese, and almost 6% have severe or morbid obesity, with a Body Mass Index of 40 or more.<sup>2</sup> While bariatric surgery rates are increasing, the safety and efficacy of the procedure has also improved. Bariatric surgery is currently the most effective weight loss treatment. It is recommended for patients with a Body Mass Index (BMI) of 40 or more or a BMI over 35 plus co-morbid illness.<sup>3,4</sup>

Type 2 diabetes mellitus (T2DM) is also skyrocketing in the U.S., a predictable increase given that T2DM goes hand in hand with obesity. T2DM is a chronic, worsening disease that over time leads to heart disease, kidney disease, loss of vision and other serious impacts. For people with severe obesity, diabetes related risks and co-morbidities compound obesity's other co-morbidities. T2DM comes with

almost certain development of cardiac and renal co-morbidities and their associated treatment costs. Research findings consistently show that bariatric surgery can drive remission of T2DM in up to 80% of patients with severe obesity.<sup>5</sup> In other words, in addition to producing dramatic weight loss, bariatric surgery reverses diabetes in the vast majority of patients.

Surgical treatment of diabetes in severely obese patients now offers the potential for remission of T2DM, along with avoidance of co-morbidities and a lifetime of treatment costs for obesity, diabetes, and co-morbidities of these conditions. In addition to clinical benefits, there are economic benefits to bariatric surgery as well.

In light of persuasive evidence, professional organizations are going on record recommending bariatric surgery as a recommended treatment of T2DM for people with severe obesity. These recommendations are discussed in this Issue Brief.

**In 2009 and 2010 AAPPO released a series of Issue Briefs and case studies examining the growing use of bariatric surgery to treat severe obesity (available at [www.aappo.org](http://www.aappo.org)). We recommend these to readers seeking additional detail on evidence based approaches to bariatric services. In this Issue Brief, AAPPO presents an overview of recent evidence examining bariatric surgery as a treatment for T2DM. We discuss implications for PPOs and recommend next steps for the industry.**

## About Diabetes

- According to the Centers for Disease Control and Prevention, in 2011 8% of the U.S. population, or almost 26 million people have diabetes. Of these, 19 million have been diagnosed, and 7 million have the disease but have not been diagnosed. The CDC projects that as many as 1 in 3 people could have diabetes by 2050 if current trends continue.<sup>6</sup>
- Type 2 diabetes is closely associated with being overweight. In a nationally representative sample of US adults, 80.3% of diabetics were considered overweight (BMI $\geq$ 25) and 49.1% of diabetics were considered obese (BMI  $\geq$ 30).<sup>7</sup>
- People with diabetes are at least twice as likely as non-diabetics to have heart disease or a stroke. People with diabetes also tend to develop heart disease or have strokes at an earlier age than other people.<sup>8</sup>
- The total cost of diabetes in the U.S. is 174 billion. People diagnosed with diabetes have 2.3 times more medical expenditures than those without the condition, and have an average annual expenditure of almost \$12,000.<sup>9</sup>
- The portion of health care expenditures to treat T2DM is expected to increase from 10 percent in 2011 to 15 percent in 2031—pushing health care costs for these patients from \$340 billion in 2011 to \$1.6 trillion in 2031 in non-deflated dollars.<sup>10</sup>
- Twenty-five percent of households with a family member suffering from diabetes spend 10 percent or more of their income on health care, while 8 percent have costs exceeding 20 percent of family income.<sup>11</sup>

## About Obesity

- The National Institutes of Health defines overweight in terms of body mass index (BMI), a measure calculated on the basis of the patient's height and weight. A BMI of greater than 25 is considered overweight. A BMI of 30 and above is considered obese, and a BMI of 40 and above is considered severe or extreme obesity.
- Severe obesity (BMI of 40 or more) has increased from 2.9% of the population in 1994 to 5.9% of the population in 2006<sup>12</sup>; for BMI of 35 or more the figure was 11% in men and almost 18% in women in 2008.<sup>13</sup> The prevalence of diabetes increases as people get heavier: 8% of normal weight individuals have diabetes compared to 43% for individuals with severe obesity.
- Obesity is often accompanied by cardiac and metabolic co-morbidities, including hypertension, coronary heart disease, diabetes and sleep apnea. These factors increase the "absolute risk" of the patient and the chances of mortality. Obesity and co-morbidities reduce patient quality of life and increase medical costs.<sup>14</sup>
- Obesity reduces employee productivity. Workers with BMI  $\geq$ 35 have a 4.2% health-related loss in productivity, 1.18% more than all other employees. This equates to \$506 annually in lost productivity per worker.<sup>15</sup>
- Obesity is linked to higher indemnity and medical workers' compensation costs. In one study employees with a BMI  $\geq$ 40 had 11.65 claims per 100 full time equivalents (FTEs), while non-obese employees had 5.80. There were more lost workdays (183 compared to 14 lost workdays per 100 FTEs). Medical claims costs showed an enormous difference: \$51,091 compared to \$7,503 per 100 FTEs, and indemnity claims costs (\$59,178 compared to \$5,396 per 100 FTEs).<sup>16</sup>

## MEDICALLY NECESSARY INDICATIONS FOR BARIATRIC SURGERY

A complete discussion of bariatric surgery and factors influencing successful outcomes is covered in AAPPO's Bariatric Surgery Issue Brief series, available at [www.aappo.org](http://www.aappo.org). This section offers a brief summary. According to professional recommendations and clinical practice guidelines, bariatric surgery is indicated for people with severe obesity with a BMI of 40 and over. It is also recommended for people with a BMI of 35 and over and who also have a co-morbid condition such as diabetes or hypertension.<sup>16</sup> In early 2011 the Food and Drug Administration approved one type of gastric banding for use in patients with BMI of 30 or more with a serious co-morbidity such as diabetes.<sup>17</sup>

The following summarizes key points about bariatric surgery:<sup>18</sup>

**About:** Bariatric surgical procedures can be carried out either through open surgery or a laparoscope. The majority of procedures are being done laparoscopically. The two dominant types of procedures are gastric restriction, which includes various types of bands, and gastric bypass. Biliopancreatic diversion and gastric sleeve procedures are also available but currently less common. Within the broad types of bypass and band there are a variety of procedures and combination procedures. Each type has a slightly different profile in terms of expected weight loss, as shown in Table 1. There are also differences in nutritional impact, follow up requirements, cost, and rate of complications.<sup>19</sup>

**Effectiveness:** Guidelines and evidence reviews conclude that bariatric surgery is the most effective treatment for severe obesity. For example, a Cochrane analysis found, "Surgery results in greater weight loss than conventional

treatment in moderate (body mass index greater than 30) as well as severe obesity. Reductions in co-morbidities, such as diabetes and hypertension, also occur.<sup>20</sup> Best results are achieved through long term patient engagement in a weight management and support program, and through use of surgical facilities with comprehensive programs and high volume.<sup>21</sup>

**Safety:** The rate of complications for bariatric surgery is comparable to that of other major procedures. A 2009 study concluded that the overall risk of death and other adverse outcomes after bariatric surgery is low, and should be contrasted to the risks the patient would otherwise experience from being extremely obese.<sup>22</sup> A review article in 2005 found mortality rates range from 0.1% to 0.2%. The rate of unexpected re-operations for surgical complications ranges from 6% to 9%.<sup>23</sup> Bariatric procedures are getting safer in spite of an older, sicker patient population undergoing surgery. Improvements are attributed to improvements in surgical skill (due to experience), and a greater use of laparoscopic surgery and banding techniques.<sup>24</sup> Patients with severe obesity and particularly those with co-morbidities also face risks from not treating the condition.<sup>25</sup> Overall, bariatric surgery reduces mortality in the severely obese.<sup>26,27</sup>

**Efficiency:** Newer procedures have reduced length of stay and cost. A comparison of costs in 2001 and 2006 found that hospital length of stay has decreased over time, and hospital payments for bariatric surgery patients have fallen. As HealthGrades has shown, there is significant price and quality variation. Reported charges are higher than actual costs due to negotiated discounts. ROI is influenced by price of surgery but is generally realized in two to four years.<sup>28</sup>

**Table 1: Reported Weight Loss as Percentage of Excess Body Weight After Bariatric Surgery**

Procedure	1-2 Year Follow up	3-6 Year Follow up	7-10 Year follow up
Vertical Banded Gastroplasty	50-72	25-65	No data
Gastric banding	29-87	45-72	14-60
Roux-en-Y gastric bypass	48-85	53-77	25-68
Biliopancreatic diversion	65-83	62-81	60-80

Excerpted from AACE/TOS/ASMBS Bariatric Surgery Guidelines citing data from multiple sources<sup>29</sup>

## BARIATRIC SURGERY TO TREAT TYPE 2 DIABETES

This section focuses on the specific relationship between bariatric surgery and resolution of T2DM. Please see our previous briefs for a more discussion review of more general issues in bariatric surgery.

### Evidence

Evidence consistently shows that bariatric surgery results in an average of 55% of excess weight loss, and in remission of diabetes in almost 80% of patients. Diabetes is improved in 87% of patients with reductions of medication use and a reduction of hemoglobin A1c levels.<sup>30,31</sup> For individuals with impaired glucose tolerance, a predictor of the onset of T2DM, bariatric surgery drives a 30 fold reduction of risk of progressing to diabetes.<sup>32</sup> Resolution of diabetes is linked to the amount of weight lost and varies by procedure.<sup>33,34</sup> (see Table2)

The impact of bariatric surgery on diabetes is the result both of weight loss and metabolic changes. Metabolic changes occur almost immediately following Roux-en-y (bypass) surgery, thus the reports that T2DM is often resolved before the surgical patient is discharged from the hospital.<sup>37</sup> Researchers are actively working to identify the metabolic mechanisms by which bariatric surgery induces long term remission of T2DM. In addition, evidence is emerging that surgery can offer treatment for other metabolic conditions include hyperlipidemia, hypertension and cancer.<sup>38,39,40</sup> Thus the concept of “metabolic surgery” is gaining ground as a definitive treatment strategy for obese patients.<sup>41,42</sup>

### Professional Recommendations

The **International Diabetes Federation (IDF)** issued a position statement in March 2011 that recommended:

*Bariatric surgery can significantly improve glycaemic control in severely obese patients with Type 2 diabetes. It is an effective, safe and cost-effective therapy for obese Type 2 diabetes. Surgery can be considered an appropriate treatment for people with Type 2 diabetes and obesity not achieving recommended treatment targets with medical therapies, especially in the presence of other major co-morbidities. The procedures must be performed within accepted guidelines and require appropriate multidisciplinary assessment for the procedure, comprehensive patient education and ongoing care, as well as safe and standardized surgical procedures. National guidelines for bariatric surgery need to be developed for people with Type 2 diabetes and a BMI of 35 kg/m(2) or more.<sup>43</sup>*

IDF’s recommendations were based on a review of evidence by IDF’s Taskforce on Epidemiology and Prevention of Diabetes and tracks with findings of other surgical and diabetes expert working groups, including a 2010 Diabetes Surgery Summit. That Summit convened a multidisciplinary panel of experts to review evidence on bariatric surgery to treat diabetes surgery and begin the process of developing evidence based guidelines for treating T2DM with surgery.<sup>44</sup> The IDF and the American Society for Metabolic and Bariatric

**Table 2: Rates of Remission for T2DM After Bariatric Surgery**

Procedure Type	Remission Rate (%)
Vertical Banded Gastroplasty	75-83
Laparoscopic adjusted silicone gastric banding	40-47
Roux-en-Y gastric bypass	83-92
Biliopancreatic diversion	95-100

Excerpted from AACE/TOS/ASMBS Bariatric Surgery Guidelines citing data from Greenway<sup>35,36</sup>

Surgery (ASMBS) jointly recommend that bariatric surgery should be considered a therapeutic option for obese individuals with T2DM and that surgery should be considered before complications of diabetes occur, rather than as a last resort.<sup>45</sup>

The American Diabetes Association professional guidelines also address bariatric surgery. According to the ADA:

*Bariatric surgery may be considered for adults with BMI greater than or equal to 35 kg/m<sup>2</sup> and type 2 diabetes, especially if the diabetes or associated co-morbidities are difficult to control with lifestyle and pharmacologic therapy.*<sup>46</sup>

The ADA also calls for additional well-controlled research comparing bariatric surgery to standard treatment and lifestyle interventions.

### Economic Impact

Multiple studies have examined cost effectiveness of bariatric surgery for people with diabetes. The logic, supported by findings, is that a reduction in treatment costs of diabetes, along with reduced treatment costs for expected co-morbidities such as cardiovascular disease can make bariatric surgery a cost effective intervention for patients with diabetes.<sup>47,48</sup> There are also productivity implications: bariatric surgery has been shown to positively influence productivity in the general and in a Medicaid population.<sup>49,50</sup>

The cost effectiveness of bariatric surgery depends in part on the cost of the surgery, and in the value assigned to various outcomes (such as patient quality of life). The large majority of studies have found bariatric surgery to be cost effective in a time period ranging from two and a half to five years. Two recent studies that considered complication rates, costs of treatment, adverse events and obesity, mortality rates, and utilities, and types of surgery (banding and bypass), concluded that bariatric surgery is clinically effective and cost-effective for people with moderate or severe obesity.<sup>51,52</sup>

For patients with diabetes, it is particularly important to value the avoidance of complications and co-morbidities. For example, a 2011 study examining the economic implications of clinical benefits of bariatric surgery for diabetes patients with BMI  $\geq 35$  concluded that the therapeutic benefits of bariatric surgery on diabetes translates into considerable economic benefits. The study found that surgery costs were recovered 26 months after surgery and that at month six, 28% of surgery patients had a diabetes diagnosis, compared to 74% of control patients. Medication and supply costs were significantly lower for surgical patients, largely because rates of cardiac and diabetic co-morbidities dropped significantly. The study concluded that surgical therapy is clinically more effective and ultimately less expensive than standard therapy for diabetes patients with BMI 35."<sup>53</sup>

## IMPLICATIONS FOR PPOS

PPO executives should know that rates of obesity surgery are rising and the medically necessary indications for bariatric surgery are evolving. Bariatric surgery is the most effective treatment for massive weight loss. It consistently triggers sustained and clinically important weight loss. Now, evidence is mounting that the metabolic effects of surgery are also important in treatment of chronic disease. Specifically, surgery is emerging as a definitive treatment for remission of type 2 diabetes in obese patients.

As evidence on bariatric surgery as a treatment for T2DM accumulates, PPOs need to consider:

- Benefit policy
- Network management
- Cost management

### Benefit Policy

Payers (employers and health plans) need to understand both the health and productivity implications of severe obesity and its definitive treatment, bariatric surgery. As discussed in other Issue Briefs, bariatric surgery is frequently excluded from covered benefits; many payers believe that it is either a lifestyle choice or a treatment of last resort. Even health care professionals often view bariatric surgery as a discretionary procedure rather than a medically necessary treatment of severe obesity. This view point and related benefit decisions are not consistent with current evidence on effectiveness of surgery in both treating obesity and treating its existing and potential co-morbid chronic diseases.

Employers should know that exclusion of bariatric surgery is not consistent with coverage of medically necessary services. It is also not necessarily a cost saving strategy: employers that do not cover bariatric surgery as a treatment still pay the costs of health and productivity losses related to obesity, along with the ongoing costs of treating co-morbidities and complications

PPO leaders working with payers and employers may want to guide them to an evidence-based bariatric surgery benefit strategy most likely to achieve intended outcomes. PPOs may want to educate these customers about the evidence on effectiveness of surgery and the cost implications. There are also strategies to maximize the value of a bariatric benefit for individuals with obesity and diabetes: for example, early intervention averts many of diabetes' costly cardiovascular and renal complications. Additionally, coverage of multidisciplinary services for an extended period facilitates the long term member engagement and nutritional support associated with the best outcomes.

### Network Management

According to a 2010 study of hospital claims by HealthGrades, there are important differences in outcomes across hospitals, with low volume hospitals tending to have more morbidity and mortality; HealthGrades reported that patients in their highest rated hospitals were 43% less likely to experience in hospital complications than patients at mid-tier programs, and 67% less likely compared to the lowest quality hospitals performing surgery. They found patients had a four times higher risk of dying if they had a bariatric surgery performed at a low quality hospital compared to a high quality hospital.<sup>54</sup>

These factors show there is considerable leverage to be exerted in PPO network design to include high quality / best outcome facilities for bariatric surgery, and that price negotiations are essential. Many national health plans including Humana, CIGNA, United, WellPoint and Aetna have implemented a Centers of Excellence (COE) approach to bariatric surgery. Often, the benefit is only available or available at a higher coverage level to members who obtain the service from a COE. Through this approach, plans and network are able to direct members to centers with better outcomes, and through increased volume, leverage better pricing.

### Cost Management

There is tremendous variation in cost of surgery. Factors influencing costs are charges, length of stay and type of procedure. One examination of costs found the mean bariatric surgery investment to be between \$17,000 and \$26,000.<sup>55</sup> However, charges may be considerably higher – speaking to the urgent need for negotiated pricing. For example, HealthGrades found that New Jersey is the most expensive state for open bariatric surgery procedures with an average charge of \$70,237 per procedure. California was the most expensive state for laparoscopic (\$53,357) and second most expensive for open bariatric surgery procedures (\$65,217).<sup>56</sup> According to HealthGrades Maryland was the least expensive state for both laparoscopic and open bariatric surgery procedures with an average charge per procedure of \$14,880 and \$16,285 respectively. Maryland also had the second shortest length of stay (1.93 days), with Utah having the shortest length of stay at 1.78 days.

Return on investment is highly dependent on the cost of bariatric surgery care (along with quality), highlighting the importance of including cost-effective providers in the PPO network. This suggests an important opportunity for PPOs to negotiate rates, to include all providers needed to deliver multidisciplinary care, and to direct patients to cost effective providers that demonstrate appropriate utilization.

### Conclusion

Evidence is indisputable that bariatric surgery has important clinical implications that include both weight loss and metabolic improvements. Professional consensus is emerging that bariatric surgery must now be considered a viable option in treatment protocols for type 2 diabetes for people with severe obesity. Surgery results in reduced lifetime complications of co-morbidities and may also result in better productivity.

PPOs will be able to deliver added value to customers by using contract and payment leverage to drive best practices, and by serving as expert consultants to customers on the issue of obesity and bariatric surgery. By providing innovative ideas to customers for improving beneficiary health and managing costs of obesity, PPO leaders will

create value-added opportunities for managing obesity and bariatric services that distinguish the PPO from competing plans. PPO leaders should consider the following opportunities to offer and manage a cost effective, quality bariatric services. These include:

- Using PPO data to identify the opportunity – showing the rate of obesity in the community, plan, or employed population and where possible, the prevalence of diabetes in members with severe obesity;
- Offering wellness programs that include a continuum of approaches to weight management, including lifestyle programs, medical weight loss and a well-managed bariatric surgery program;
- Ensuring that appropriate bariatric practitioners are contracted in the network, including certified bariatric Centers of Excellence and bariatric specialists from all necessary disciplines, including surgery, psychiatry, nutrition, exercise, and diabetes education;

- Negotiating with providers and COEs for comprehensive bariatric surgery services at the most competitive pricing;
- Educating primary care practitioners on medical and surgical weight management practices, and the outcomes that can be expected for each, along with information on surgical referral;
- Tracking and reporting to customers on bariatric surgical outcomes, including mortality, complications and other morbidities, and resolution of medical conditions such as obesity, T2DM and hypertension.

PPO executives can expect and should prepare for a greater demand in bariatric medical, pharmacologic and surgical care. Bariatric surgery offers the promise of improvement in health and productivity of patients. PPOs should stay ahead of this trend to ensure they are out front in promoting cost effective approaches with the best outcomes.

#### Resources

Position statement: Bariatric Surgical and Procedural Interventions in the Treatment of Obese Patients with Type 2 Diabetes. International Diabetes Federation Taskforce on Epidemiology and Prevention [www.asmb.org/download/IDF-Position-Statement-Bariatric-Surgery.pdf](http://www.asmb.org/download/IDF-Position-Statement-Bariatric-Surgery.pdf)

HealthGrades Fifth Annual Bariatric Surgery Trends in American Hospitals Study. May, 2010. [www.healthgrades.com/media/DMS/pdf/HealthGradesBariatricSurgeryTrendsStudy2010.pdf](http://www.healthgrades.com/media/DMS/pdf/HealthGradesBariatricSurgeryTrendsStudy2010.pdf)

Metabolic and Bariatric Surgery Medical Guidelines for Clinical Practice for the Perioperative Nutritional and Nonsurgical Support of the Bariatric Surgery Patient. AACE/TOS/ASMBS. [www.asmb.org/Newsite07/resources/aace-tos-asmb.pdf](http://www.asmb.org/Newsite07/resources/aace-tos-asmb.pdf)

Bariatric Surgery: The Benefits and Risks for Plan Sponsors. Aon Consulting 2010 [www.aon.com/attachments/bariatric.pdf](http://www.aon.com/attachments/bariatric.pdf)

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