

# Bariatric Surgery Costs for the Arkansas Employee Benefits Division

## Background

Obesity, a national epidemic, has now been classified as a disease by the American Medical Association. This recognizes the critical role that obesity plays in many other serious health conditions—several of which are also the leading causes of preventable deaths including heart disease, stroke, Type II diabetes, and certain types of cancer. Obesity is not only a significant factor in individuals' health, but a major contributor to the rising costs of health care.

Data from a health risk assessment fielded to Arkansas state employees between 2004 and 2008 showed dramatic cost differences within the population between those who were obese compared to those who were not. As shown in Figure 1, obese members' annual total medical costs were 54% higher than costs for those listed as "No Risk"—meaning not obese, or being at an ideal weight for their height. Clearly, obesity and its correlated conditions represent a threat to the long-term viability of a health plan, as well as the health of its members.

Bariatric surgery has been identified as a potential intervention to cause significant weight loss and reduce costs associated with obesity. However, studies regarding the long-term clinical and cost effectiveness of bariatric surgery are limited.

In 2011, the 88<sup>th</sup> General Assembly of the State of Arkansas passed legislation that charged the Employee Benefits Division (EBD) with creating a pilot program to research the pros and cons of offering bariatric surgery as a benefit on the state and public school employee health insurance plan. Enrollment for the program began in July 2011, and surgeries were first performed in early 2012. The pilot program is currently scheduled to end on December 31, 2017. To be eligible for the program, members must have a body mass index (BMI) of 40kg/m<sup>2</sup>, or 35kg/m<sup>2</sup> with an existing comorbid condition. The program covers several types of surgeries including stomach stapling, surgeries that restrict the size of the stomach, and surgeries affecting the path in which food is absorbed.

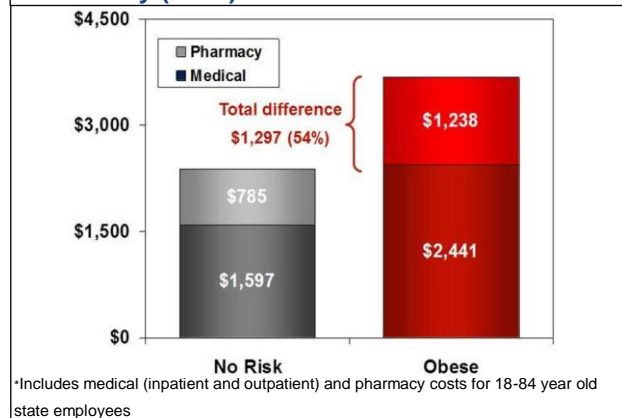
The following data come from a combination of a data pull from EBD's live database, a review of national data, and a more in-depth, but short term, medical claims analysis of those receiving bariatric surgery through the state and public school health plan benefit.

## Findings

### Program Enrollment

According to the EBD's most recent reports, more than 500 surgeries have been performed during the first two years of the five-year program. There are at least 60 members still under review in the program, and program enrollment continues to rise. The number of bariatric surgeries performed in 2012 increased by 73% in 2013. The average cost of all surgery-related charges was \$10,921 for Arkansas state employee (ASE) members and \$9,902 for public school employee (PSE) members.

**Figure 1: Annual Average Total\* Costs Linked to Obesity (2006)**



## Costs Incurred

### Cost of Members Receiving Surgery

Since the beginning of the program, costs incurred for all medical- and pharmacy-related charges for members receiving bariatric surgery come to \$17.1million. This amount represents 1.7% of total plan costs for 2012 and 2013, for just 0.18% of the population, which is approximately nine times the expected amount.

### Surgery-Specific Costs

The total for charges from the day on which bariatric surgery was performed for members between 2012 and 2013 came to \$5.6million. This includes ancillary charges such as anesthesia, but not any future follow up complications or adjustments. Complications have occurred in about 19% of surgeries, totaling an additional \$287,587 to date.<sup>a</sup>

### Membership Contribution

With bariatric surgery offered as a covered benefit, members receiving surgery are responsible for contributing to charges as the plan schedule dictates. For example, in 2013, members on the silver plan had a \$300 copay and 20% coinsurance for the facility fee. The plan also required 20% coinsurance for the surgeon fee.

**Table 1: Surgery Expenses**

	2012	2013	Totals
PSE Surgeries	112	154	266
PSE Surgery Expenses*	\$1,136,570	\$1,497,431	\$2,634,002
ASE Surgeries	116	157	273
ASE Surgery Expenses*	\$1,255,719	\$1,725,786	\$2,981,505

Including ancillary charges on the day of procedure

## Surgery Impact

In order to examine any and all impact on members' health after surgery as well as potential savings through health improvement to the plan, a subsample of the surgery population was analyzed. Only members for whom data from both twelve months before the surgery date, as well as post-surgery claims data were available were included. The following analyses examine this subpopulation of 230 unique individuals who underwent bariatric surgery between 2012 and 2013.

### Pre-Surgery Analysis

The availability of cost data before and after surgery was a main criterion to be included in this subsample analysis. There were 11-12 months of data available for 98% of the 230 members. The average monthly costs for each of these 226 patients were \$480.64. The most common diagnosis for the claims contributing to these costs was Morbid Obesity, found in about 10.5% of claims. The pre-existing comorbid conditions that can determine a member's eligibility for surgery include hypertension, diabetes, sleep apnea, and cardiopulmonary conditions, which when combined make up about 18% of claims diagnoses.

### Post-Surgery Analysis

For the 230 members included in the subsample analysis, the maximum amount of follow-up data at this time only includes 17 months. Only 13% of this sample has 12 or more months of follow-up cost data. Table 2 shows the average monthly cost for these 230 members by the number of months for which post-surgical costs are available. The greatest portion of the sample has 7-11 months of follow up data, which includes 150 members. The pre-existing comorbidities make up about 21% of post-surgery claims diagnoses for this group.

At this time, there is inadequate information to be able to determine long-term benefits resulting from bariatric surgery to individuals or the health plan. More time, as well as a more definitive study population, would enhance the ability to analyze the impact of this benefit.

**Table 2: Post-surgical Costs by Month**

Mean	Std. Dev.	Min-Max	Members
------	-----------	---------	---------

<sup>a</sup> Some charges for 2013 are still being processed. Once all claims are received and adjusted the number of total procedures, procedure only cost, and day of surgery costs may change. Complications resulting from surgery could continue to occur at an unknown rate for both years' of surgery, as well as future years.

Months of Follow-up Data	3 mo. or less	435.85	798.55	0-1,633.03	4
	6 mo.	662.93	662.93	0-3,846.77	46
	7-11 mo.	387.28	831.35	7-9,101.15	150
	12 plus	442.08	559.84	24.98-2,715.74	30
	<b>Total</b>	400.15	764.52	0-9,101.15	230*

\*230 is the total number of surgeries for which an adequate amount of both pre- and post-surgery data is available at this time.

## National Trends

### Impact of Bariatric Surgery on Health Care Costs of Obese Persons

*Journal of the American Medical Association Surgery; June 2013<sup>1</sup>*

Some of the most recent peer-reviewed literature shows that after six years of follow up data, there are no long-term savings to health plans resulting from bariatric surgery. This particular study, published in June 2013, followed nearly 30,000 patients and used a 1:1 comparison group with patients who used alternative interventions to surgery. Because of the positive benefits seen in a small percentage of surgery recipients, critics of the article suggest criteria that are more exclusive. These criteria may include requiring a demonstrated history of compliance to medical directions or comorbid conditions that have been continuously proven to significantly improve with dramatic weight loss.

### Results of Bariatric Surgery

*International Journal of Obesity; May 2001<sup>2</sup>*

While initial weight loss is seen as dramatic in studies across the board, only a small percentage of participants maintain that weight loss. An even smaller amount, only 8%, ever reaches normal height/weight proportions. This study also showed that 19% of patients required a revisionary operation, which is consistent with EBD's rate of 19% resulting in complications to date.

### Systematic Review of Long-Term Weight Loss Studies in Obese Adults

*International Journal of Obesity; October 2005<sup>3</sup>*

This article reviewed studies to compare effectiveness between pharmaceutical interventions, dietary/lifestyle interventions, and surgical interventions for weight loss. The main issue highlighted is the availability of follow-up data, mainly due to patient compliance. The longest timeframe compared was 2-4 years, which other studies refute as valid for "long-term" study. Surgical intervention showed significant weight loss in a short time frame especially compared to dietary intervention, but came at a substantially higher cost.

### A Cost-Benefit Simulation Model of Coverage for Bariatric Surgery Among Full-Time Employees

*American Journal of Managed Care; October 2005<sup>4</sup>*

Depending on the distribution of costs before surgery, it can take 5-17 years for the costs of bariatric surgery to break even with predicted future costs. This model also depends on maintaining initial weight loss over this span of time, which should lessen the costs of treatments for comorbid conditions.

## Study Comparisons

## Caveats

The previous analysis of pre- and post-surgery data was conducted on a sub-sample of members for whom both pre- and post-surgery data were available. The original sample available in the claims-adjusted database included 333 unique members. The final sample size used for the subsample analyses was 230 members, after eliminating certain members due to the date of surgery, lack of follow-up time, or available claims data. There are several methodological differences between the previously reported national studies and the data represented in this preliminary short-term assessment. The majority of these differences revolve around the amount of time since surgery, as well as the inclusion of clinical data. Key differences to remember in the review of EBD adjusted claims are described in Table 3 below.

**Table 3: Study Comparisons**

Measure/Method	Peer-reviewed Literature	Preliminary EBD Analysis
Follow-up time	Recommended 18-60 months	Average of 8 months
Clinical data	Often included and compared	Not yet included
Sample size	1500-5000 patients	Final analysis includes 230
Comparison group	Used to compare bariatric surgery to non-surgical interventions	None
Diagnosis Related Groups/ Clinical Grouper Software	Used to calculate disease-related costs	Claims costs only
Bariatric Surgery Program Design	Tested model	Program changes were made throughout enrollment period
Pharmacy costs	Included in total costs	Not yet included

## Future analyses

### Clinical Program Data

Clinical data from EBD's case management group, American Health Holdings, has been requested. This information will be matched using blinded EBD member IDs to join clinical and claims data. This combined data set will offer greater insight into the population, and set up future research opportunities.

### Program Evaluation Over Time

With more time to follow those who have already undergone surgery, the program will have a more complete picture of the population both before and after surgery. Decisions concerning eligibility, surgery type, coverage limitations, and the enrollment process will be more informed as more data are gathered. Moreover, members' costs and outcomes will be more complete and be able to be reviewed on a case-by-case basis to determine long-term effectiveness.

<sup>1</sup> Weiner JP, Goodwin SM, Chang HY, Bolen SD, Richards TM, Johns RA, Momin SR, Clark JM. Impact of bariatric surgery on health care costs of obese persons: a 6-year follow-up of surgical and comparison cohorts using health plan data. *JAMA Surg.* (2013)148(6):555-562.

<sup>2</sup> AM Wolf, B Kortner, HW Kuhlmann. Results of bariatric surgery. *International Journal of Obesity.*(2001) 25, Suppl 1, S113-S114.

<sup>3</sup> JD Douketis, C Macie, L Thabane, DF Williamson. Systematic review of long-term weight loss studies in obese adults: clinical significance and applicability to clinical practice. *International Journal of Obesity* (2005) 29, 1153-1167.

<sup>4</sup> Eric A. Finkelstein, PhD; and Derek S. Brown, PhD. A Cost-benefit Simulation Model of Coverage for Bariatric Surgery Among Full-time Employees. *American Journal of Managed Care.* (2005) Oct; 11(10):641-6.