# Rates of readmission and ER visits of Publicly vs Commercially insured patients in an MBSAQIP accredited Center

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## Background

There are over 200,000 metabolic and bariatric surgeries (MBS) performed yearly in the United States [english]. MBS ultimately saves the health system money, but that does come with additional costs. One of the controllable costs may be early readmissions [Aman]. There has been a push from the American Society of Metabolic and Bariatric Surgeons (ASMBS) to decrease readmissions after surgery. This has been formalized in the DROP program, or the Decreasing Readmissions through Opportunities Provided [Azagury]. Readmissions is also a metric that is closely examined during accreditation or reaccreditation for bariatric centers participating in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP), which is sponsored by the American College of Surgeons (ACS).

Despite the attention focused on decreasing readmissions, not all patients are the same, and there is some data that indicates that patients with government sponsored insurance (Medicare and Medicaid) have higher utilization of emergency services and higher readmission rates compared to other patients [dallal 2012]. This is important because although each bariatric program is evaluated using the same criteria patient populations vary widely. The MBSAQIP does not take into account the insurance status of the patients undergoing MBS, which may lead to some bariatric programs having higher rates of readmission, emergency department (ED) visits, and even reoperations and potentially being penalized unfairly. Our hypothesis was that there would be an increased rate of ER visits and readmissions in Medicaid and Medicare patients undergoing bariatric surgery within 30 days.

## Method

We used our data from a single institution that was submitted to the MBSAQIP Participant Use Data File (PUF) for the years 2015-2018 and added insurance status. Our accredited center has had continuous accreditation, first with the Surgical Review Corporation and later with the ACS since 2001. It is a private, community based program. Our outcomes of interest were readmission, ER visits, re-interventions and reoperations. The standard demographic and patients' characteristics that are reported in the PUF were examined for those patients that were readmitted or had an ER visit within 30 days of surgery.

Quantitative variables were described using mean, and standard deviation (SD). For skewed data, median and inter-quartile range (IQR) was used. Categorical variables were described using frequencies and proportions. To assess the differences across insurance status, the student's t-test (Wilcoxon sum rank test for skewed data), and the chi – squared test was used. Linear regression models, along with generalized linear models with a link log and family Poisson, were used to assess the unadjusted and adjusted association. These were reported as regression coefficients (RC) and prevalence ratio (PR), along with their 95% confidence interval (CI). The backward stepwise regression at an entry level of 5% and removal level of 10% was used to assess the variables to be included in the adjusted models. Skewed observations, such as length of stay (LOS), were log- transformed before including them in the model. P values less than 5% were considered statistically significant. All analyses were carried out using STATA v.15.

## Results

The overall rate of ER visits, readmissions, and reoperations were 3.5%, 7.4%, and 2.2% respectively. Medicaid and Medicare patients were found to have longer operative times, 62.7 minutes vs 57.5 minutes (p = 0.35) however, this association was not statistically significant when adjusted for possible confounders. Patients on public insurance had higher risk of ER visits (PR 1.43, 95% CI:0.41 -5.3; p = 0.58) and readmissions (PR 1.64, 95% CI 0.76-3.55; p = 0.21) than patients on commercial/ self-pay insurance. Reoperations within 30 days were lower in the publicly insured group (PR 0.93, 95% CI 0.2-4.7; p = 0.92) than patients on commercial/ self-pay insurance.

## Table 2.

**Unadjusted association between selected outcomes and insurance status**

| | | Insurance Status | | | | |
|---|---|---|---|---|---|---|
| **Factor** | **Cohort** | **Commercial / Self Pay** | **Government** | **p-value** | **PR (95% CI)**** | **p-value** |
| **N** | **403** | **323** | **80** | | | |
| **OUTCOMES** | | | | | | |
| Duration of Surgical Procedure (in minutes), mean (SD) | 58.5 (20.1) | 57.5 (19.9) | 62.7 (20.4) | 0.036 | 5.26 (0.36, 10.15)* | 0.035 |
| Hospital Length of Stay (LOS), mean (SD) | 1.8 (2.8) | 1.8 (3.1) | 1.9 (1.0) | 0.66 | 0.16 (-0.54, 0.85)* | 0.66 |
| Log of LOS, mean (SD) | 0.4 (0.5) | 0.4 (0.5) | 0.6 (0.4) | <0.001 | 0.19 (0.08, 0.3)* | 0.001 |
| Hospital Length of Stay, median (IQR) | 2.0 (1.0, 2.0) | 2.0 (1.0, 2.0) | 2.0 (1.0, 2.0) | <0.001 | | |
| Log of LOS, median (IQR) | 0.7 (0.0, 0.7) | 0.7 (0.0, 0.7) | 0.7 (0.7, 0.7) | <0.001 | | |
| Emergency Department (ED) Visits | 14 (3.5%) | 10 (3.1%) | 4 (5.0%) | 0.41 | 1.62 (0.52, 5.02) | 0.41 |
| Readmission | 30 (7.4%) | 21 (6.5%) | 9 (11.3%) | 0.15 | 1.73 (0.82, 3.64) | 0.15 |
| Reoperations within 30 Days | 9 (2.2%) | 7 (2.2%) | 2 (2.5%) | 0.86 | 1.15 (0.24, 5.46) | 0.86 |
| Interventions within 30 Days | 1 (0.2%) | 0 (0.0%) | 1 (1.3%) | 0.044 | | |
| Revision/Conversion | 27 (6.7%) | 20 (6.2%) | 7 (8.8%) | 0.41 | 1.41 (0.62, 3.23) | 0.41 |

## Table 3.

**Unadjusted and adjusted association between selected outcomes and insurance status**

| | PR | 95% CI[α] | | p value |
|---|---|---|---|---|
| Duration of Surgical Procedure (in minutes), RC (95% CI)* | 1.14 | -3.21 | 5.48 | 0.61 |
| Log of LOS, RC (95% CI)** | 0.04 | -0.04 | 0.13 | 0.33 |
| Emergency Department (ED) Visits*** | 1.43 | 0.41 | 5.03 | 0.58 |
| Readmission**** | 1.64 | 0.76 | 3.55 | 0.21 |
| Reoperations within 30 Days***** | 0.93 | 0.20 | 4.27 | 0.92 |
| Interventions within 30 Days | --- | --- | --- | --- |
| Revision/Conversion****** | 1.46 | 0.68 | 3.14 | 0.33 |

*Adjusted for: Procedure, smoking status, hypertension and sleep apnea, **Adjusted for: Procedure, hyperlipidemia, and sleep apnea,**Adjusted for; Procedure, ASA CLASS, and Gender, ****Adjusted for: Procedure, ASA CLASS, Sleepea and hyperlipidemia,*****Adjusted for: Procedure, ******Adjusted for: Age, hypertension, procedure, GERD, and DM

## Conclusion

- Publicly insured patients tend to have a higher risk of ER visit and readmissions.
- The rate of reoperation was slightly lower in publicly insured patients.
- There was no difference in complications between publicly insured and commercially insured patients.

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