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# Analyzing Patient Risk Factors in Ambulatory Surgery Complications

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# Analyzing Patient Risk Factors in Ambulatory Surgery Complications

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## Background

- In 2010, the CDC reported 28.6 million ambulatory surgery (AS) visits with an estimated 48.3 million procedures performed.<sup>1</sup>
- A number of adverse events were noted at a large suburban community hospital network's ASC.
- Validated risk calculators in surgical patients include the American College of Surgeons (ACS) National Surgical Quality Improvement Project (NSQIP) surgical risk calculator, the modified frailty index (mFI), and the Charlson Comorbidity Index (CCI).<sup>2,3,4</sup>

## Problem Statement

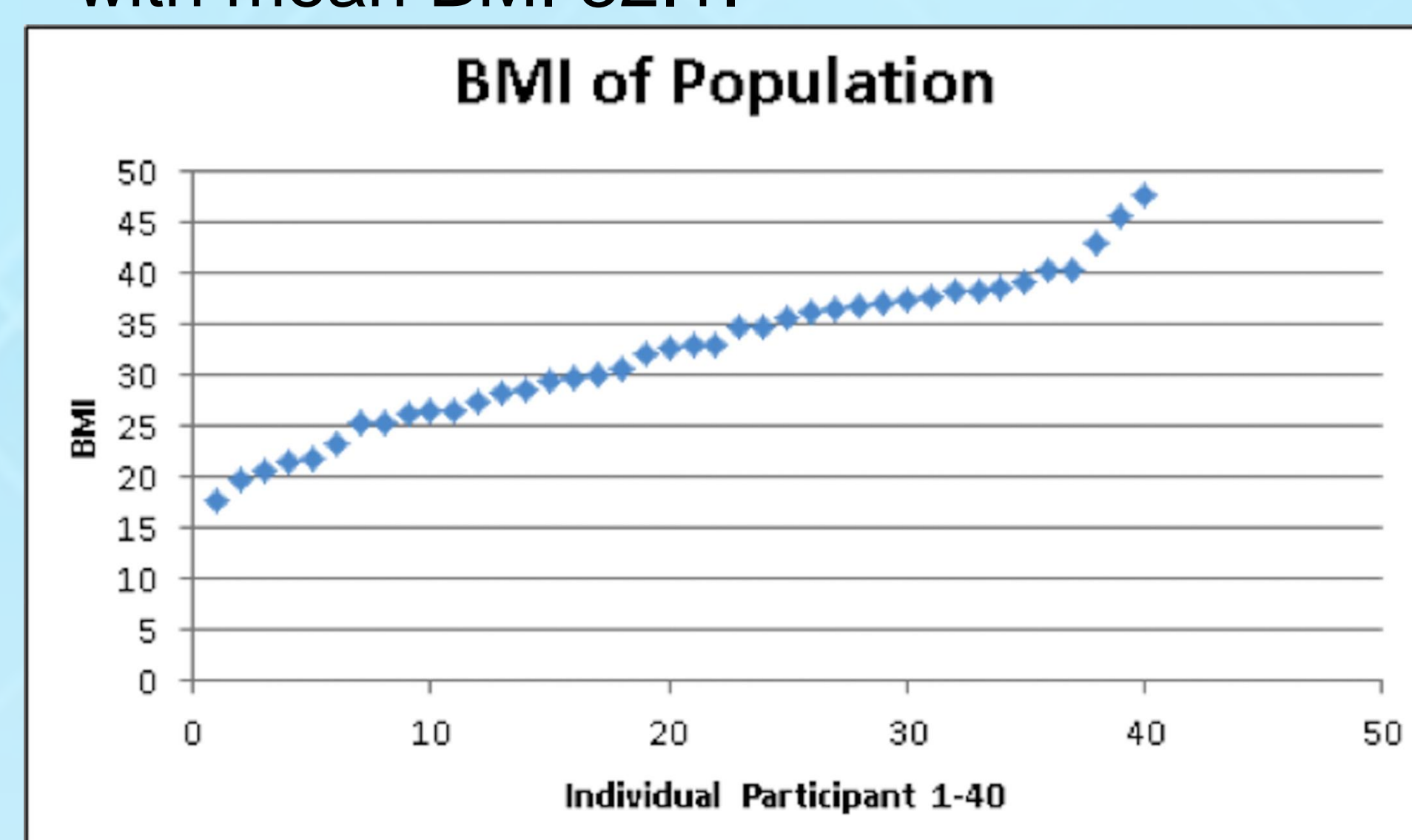
This quality improvement (QI) project analyzed patients who experienced adverse events at a suburban community hospital network's ASC.

## Methods

- Using a Patient Safety database, a cohort of 40 patients was identified.
- Surgical risks were estimated using the ACS NSQIP surgical risk calculator, the mFI, and the CCI.<sup>2,3,4</sup>
- Chart review was performed for risk factors indicating increased morbidity and mortality as identified by Mathis et al., including overweight/obesity, chronic obstructive pulmonary disease (COPD), history of transient ischemic attack (TIA) or cerebrovascular accident (CVA), hypertension (HTN), previous cardiac surgical intervention, and prolonged operative time.<sup>5</sup>
- Age, sex, zip code, weight, height, length of stay before transfer, cause of death, death year, HTN, operative time greater than 1 hour, history of obstructive sleep apnea (OSA), history of pacemaker placement, history of cancer, history of bleeding disorder, history of chronic kidney disease, ASA class, date and type of surgery were also included.
- Descriptive statistics were performed.

## Results

- The mean age was 63.85 years with the median age 66.
- There were 17 males (42.5%) and 23 females (57.5%).
- 60% of patients were obese (BMI  $\geq 30$ ) with mean BMI 32.1.



- 70% of patients (26/40) were transferred to LVHN-Cedar Crest (CC).
- Mean time to transfer was 21.17 hours.
- Median time to transfer was 6.5 hours.

Event Description	Number of Events Reported	Percent of Events reported
Other	1	2.5%
Hospital transfer/admission from ASC	28	70%
Hospital admission/ED visit after discharge	1	2.5%
SSI	6	15%
Canceled surgery due to medical reason	1	2.5%
Reoperation	1	2.5%

Table 2: Adverse events experienced.

- Average risk from ACS NSQIP surgical risk calculator was 1.11, indicating above-average risk for surgery.
- The average CCI score was 3.78, indicating an estimated 10-year survival of 53%.<sup>4</sup>

Risk Factor	Number of Patients	Percent out of Total
Death	3	7.5%
Diabetes	11	27.5%
HTN	29	72.5%
Cancer	5	12.5%
Smoker at any time	13	32.5%
CHF	2	5%
Bleeding disorder	0	0%
CRF on dialysis	0	0%
Pacemaker	0	0%
COPD	2	5%
TIA/stroke	4	10%
OSA	11	27.5%
Previous cardiac surgical intervention	5	12.5%
Surgery time > 1 hour	5	12.5%

Table 2: Patient risk factors. Percentages shown are calculated using number of patients with disease or death divided by total number of patients in study.

- There were 3 deaths, characterized below.

Risk Factor	Percent of total with risk factor (x/3)
Diabetes	33%
Hypertension	66%
Cancer	0%
Smoker at any time	66%
CKD present	33%
COPD	33%
TIA/CVA	0%
OSA	33%
Previous cardiac surgical intervention	0%
Surgery time > 1 hour	33%*

Table 3: Risk Factors Present in Patients Experiencing Morbidity at TMC. \*One patient had no data available on surgery length.

## Discussion

- Obesity is a common risk factor found in the TMC population and could indicate increased preoperative risk.
- OSA as a significant risk factor for ASC surgery needs further investigation.
- The three patient deaths do not have an outstanding common factor.
- Physicians can use the ACS NSQIP surgical risk calculator, the mFI, and the CCI in their preoperative assessment of ASC patients.
- Patients with significant medical comorbidities, including obesity, COPD, chronic kidney disease, and OSA should receive a "second look" before approval for AS.
- Further research into the TMC transfer process could help shorten transfer time.

## Conclusions

- This project incorporates two SELECT domains, health systems and VBPC, to improve patient safety and satisfaction.
- Obesity is the most outstanding common factor between cases.
- The TMC transfer process should undergo further investigation.
- Risk calculators may prove useful.
- This project demonstrates that the TMC health system selects appropriate candidates for AS.

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