



ABSTRACT

Research Objective:
 Bariatric surgery achieves superior weight loss and reduction in morbidity and mortality in patients with obesity compared to lifestyle and medical interventions. Despite these benefits, few eligible patients undergo bariatric surgery. It is not known, however, how many eligible patients discuss bariatric surgery with their clinicians and whether a dearth of discussions may be a contributing factor to bariatric surgery underutilization. We therefore conducted a study to analyze prevalence of bariatric surgery discussions, characteristics of patients who have them and subsequent outcomes.

Study Design:
 We studied adults with BMI ≥ 35 kg/m² followed at primary care practices affiliated with two academic medical centers between 2000 and 2015. Bariatric surgery discussion was assessed over one year after study entry using a validated natural language processing tool. We analyzed notes from specialties that treat obesity or obesity-related comorbidities and therefore may discuss bariatric surgery with patients (primary care, endocrinology, cardiology, etc.). Outcomes were assessed two years after study entry.

Principal Findings:
 Among 33,272 study patients, 6.2% of study patients had documentation of bariatric surgery discussion during the 1st year after study entry. In multivariable analysis, patients who had higher BMI (OR 1.14; 95% CI 1.13 to 1.15; $p < 0.0001$), or commercial insurance (OR 1.23; 95% CI 1.10 to 1.37; $p = 0.0002$) were more likely to discuss bariatric surgery with their providers. Bariatric surgery discussion was associated with a 1.77 kg/m² decrease in BMI from baseline ($p < 0.0001$). Bariatric surgery discussion was associated with OR of 1.37 (95% CI 1.36 to 1.39; $p < 0.0001$) for undergoing the procedure.

Conclusions:
 In this large population-based study of obese adults, bariatric surgery discussion, while very uncommon, was associated with a greater decrease in BMI and a significantly increased likelihood of undergoing bariatric surgery. These findings suggest that bariatric surgery discussion between patients and providers is an important, but vastly underutilized, step in treatment of obesity.

BACKGROUND

- Obesity is epidemic in the U.S. and leads to multiple complications.
- Bariatric surgery is an effective and safe treatment for obesity.
- However, few eligible patients undergo bariatric surgery.
- It is not known how discussions of bariatric surgery between patients and their clinicians impact patients' weight and receipt of bariatric surgery.

METHODS

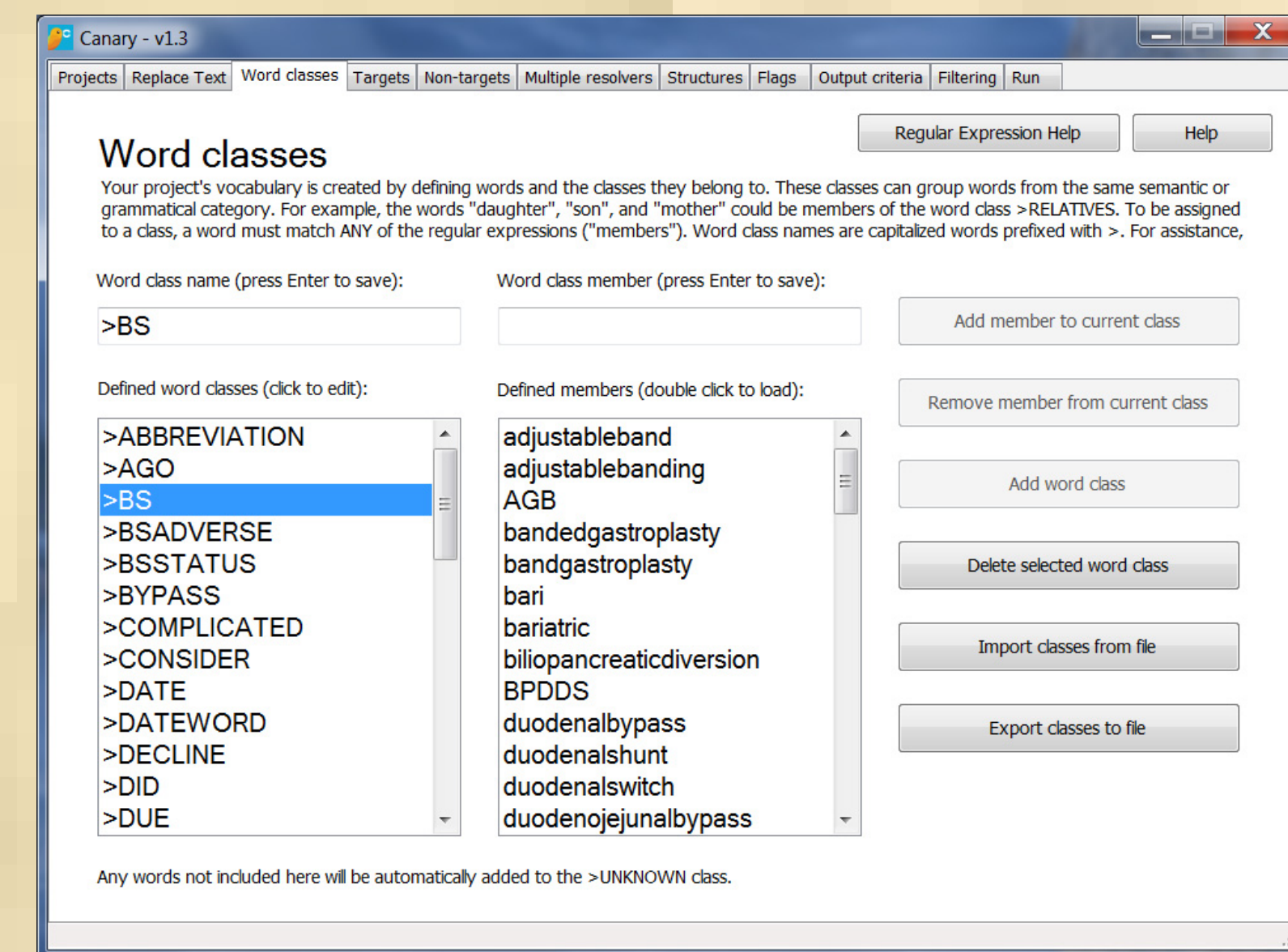
- RESEARCH QUESTIONS:**
- How often do patients discuss bariatric surgery with their clinicians?
 - Do patients who discuss bariatric surgery a) lose more weight and b) are more likely to have bariatric surgery.

- Study population: adults 18-65 years old with BMI ≥ 35 kg/m² treated at Partners HealthCare between 2005 and 2015.
- NLP tool was developed using open-source Canary NLP platform and was validated against a manually annotated *ground truth* dataset.
- Prevalence of bariatric surgery discussions was analyzed for encounters with clinicians who could be treating obesity or its complications (e.g. primary care physicians, cardiology, endocrinology, etc.) during the 12 months after study entry.
- Outcomes: a) change in weight and b) receipt of bariatric surgery during 24 months after study entry.
- Relationship between bariatric surgery discussion and study outcomes was analyzed using multivariable regression models adjusting for patient demographics, comorbidities, smoking history and BMI while adjusting for clustering within providers.

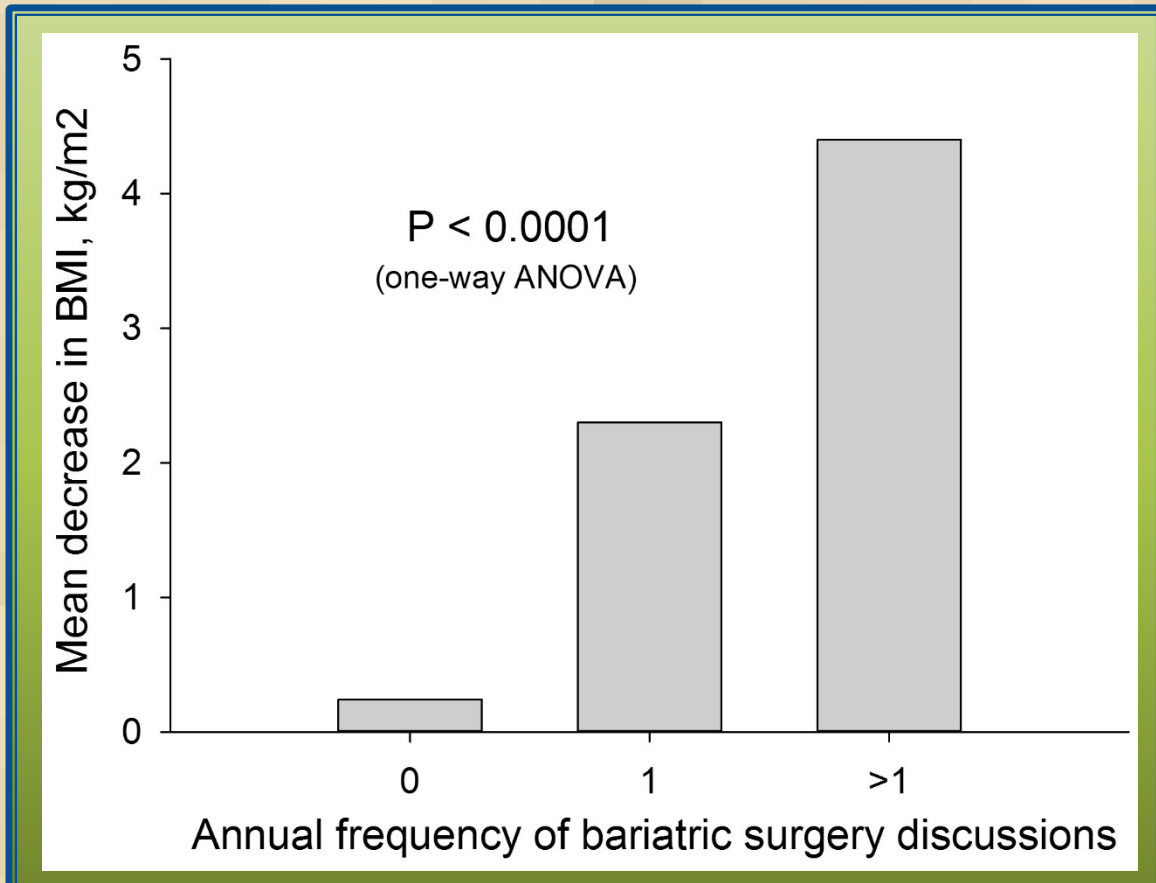
RESULTS

NLP Tool Accuracy, %			
	Sensitivity	Specificity	PPV
High Sensitivity	89.3	99.4	75.8
High PPV	67.7	99.9	91.3

- Study population: 31,250
- EMR notes analyzed: 708,155
- Age (SD) 43.5 (12.4) years
- BMI (SD) 38.9 (4.3) kg/m²
- Female 64.7%
- White 64.6%
- Diabetes mellitus 17.0%
- Hypertension 41.4%
- Discussed bariatric surgery **9.0%**
- BMI change -0.4 kg/m²
- Underwent bariatric surgery **4.7%**



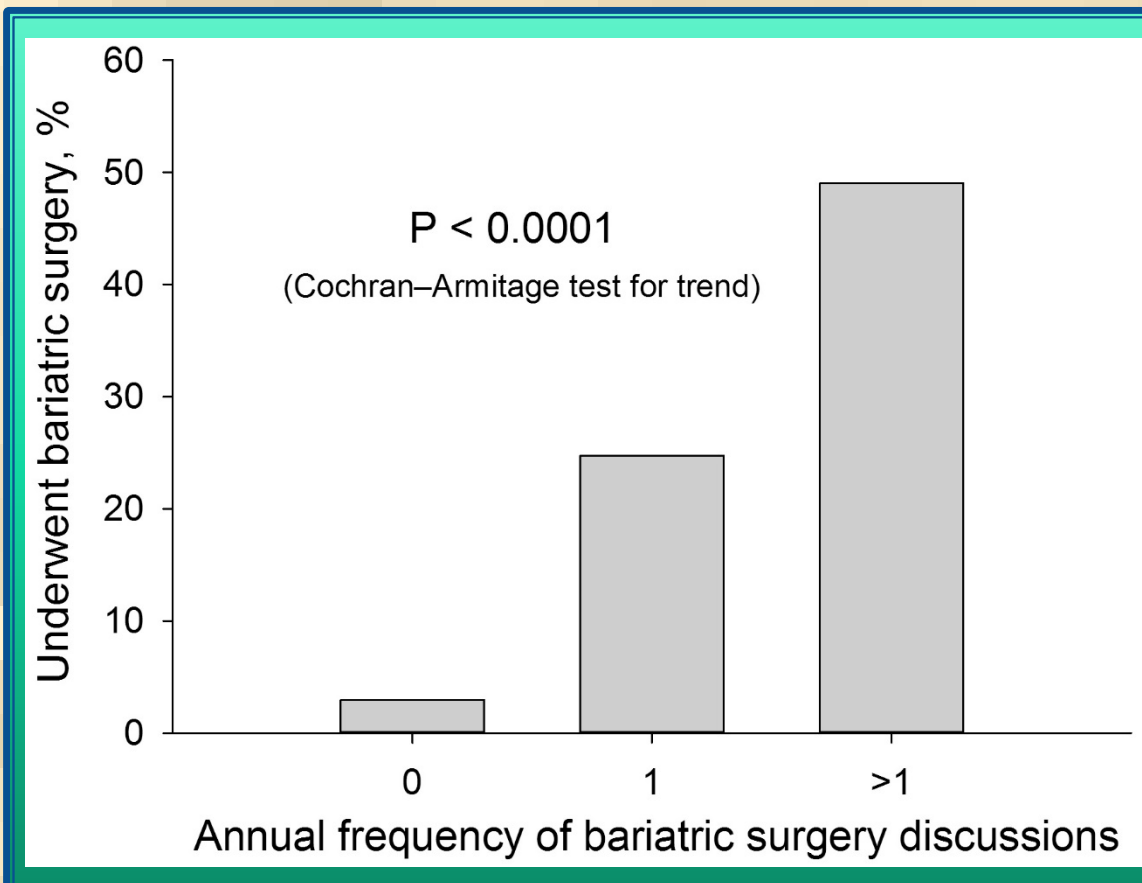
<http://canary.bwh.harvard.edu>



Multivariable Analyses

Bariatric Surgery Discussion and Change in BMI
 Effect size: -1.1 kg/m² (-1.2 to -1.0))
 P-value: < 0.0001

Bariatric Surgery Discussion and Receipt of Bariatric Surgery
 Odds ratio: 3.5 (3.1 to 3.9)
 P-value: < 0.0001



CONCLUSIONS

- Bariatric surgery discussions between patients with obesity and their clinicians are uncommon
- Patients who had bariatric surgery discussions with their clinicians are more likely to both lose weight and to undergo bariatric surgery