

**2022 New York State Chapter of the ASMBS  
Annual Conference  
October 6-7, 2022**

**David You, MD, PhD**  
MIS Fellow  
Department of Surgery



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# Disclosures

**NONE**



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# Bariatric surgery outcomes in geriatric patients: a contemporary, nationwide analysis

Russyan Mark Mabeza, B.S.<sup>a,\*</sup>, Yifan Mao, B.S., B.A.<sup>b</sup>, Kahtrel Maynard<sup>c</sup>, Cory Lee, D.O.<sup>a</sup>,  
Peyman Benharash, M.D.<sup>a</sup>, Amy Yetasook, M.D.<sup>d</sup>

<sup>a</sup>*Cardiovascular Outcomes Research Laboratories (CORELAB), David Geffen School of Medicine, University of California, Los Angeles, California*

<sup>b</sup>*David Geffen School of Medicine, University of California, Los Angeles, California*

<sup>c</sup>*Brown University, Providence, Rhode Island*

<sup>d</sup>*Department of Surgery, Harbor UCLA Medical Center, Torrance, California*

Received 24 January 2022; accepted 17 April 2022

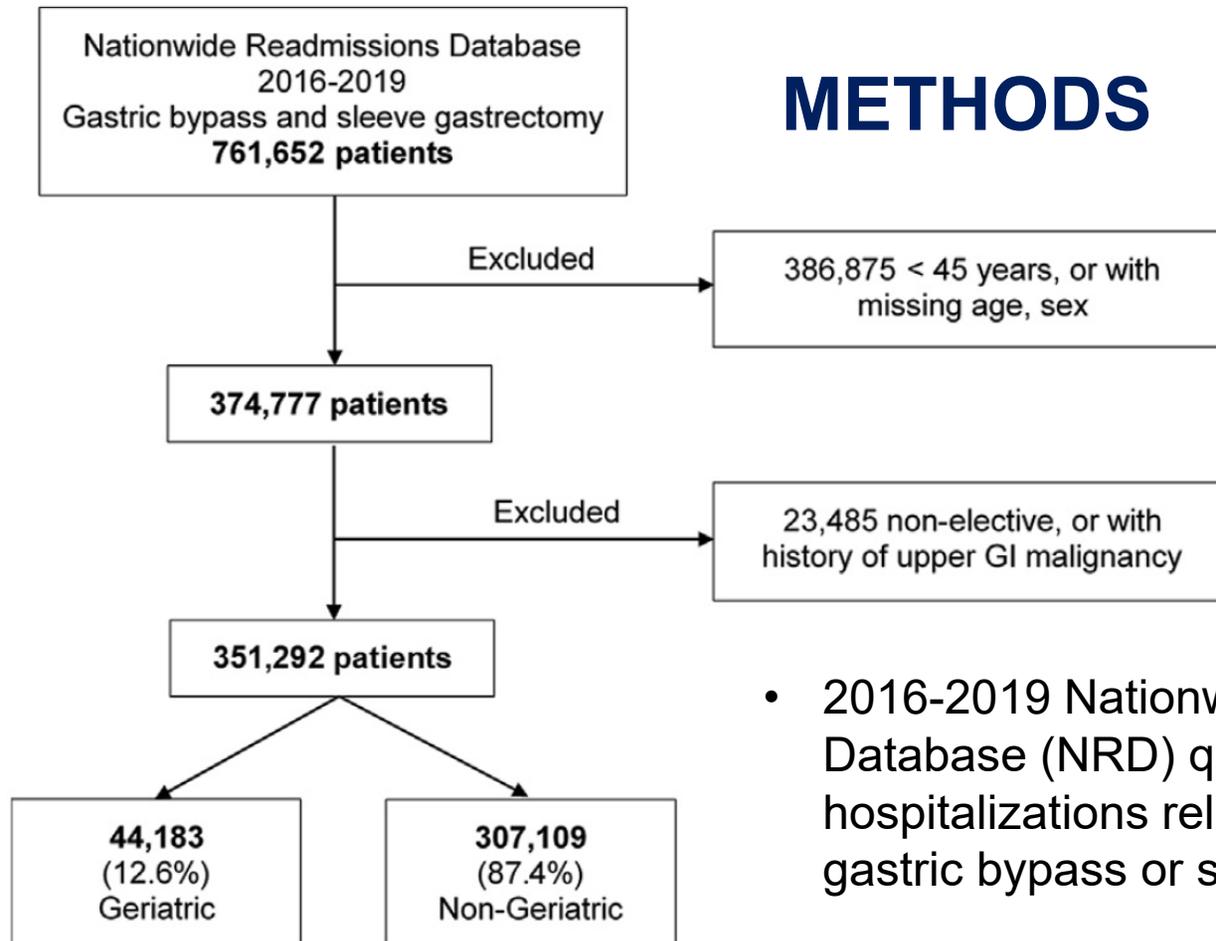
*Surgery for Obesity and Related Diseases* 18 (2022) 1005–1011

- Retrospective cohort study of 44,183
- Author's hypothesis: Geriatric status associated with higher rates of postoperative mortality, complications, and greater healthcare costs



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# METHODS



- 2016-2019 Nationwide Readmissions Database (NRD) queried for all hospitalizations related to laparoscopic gastric bypass or sleeve gastrectomy
- Geriatric  $\geq 65$  yr



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# METHODS CONT.

- Used the **Elixhauser Co-morbidity Index**
  - Method of categorizing comorbidities of patients based on ICD-10 diagnosis codes
  - Composite score of 30 co-morbidities
- Categorized postoperative complications as (1) cardiac, (2) respiratory, (3) infectious, (4) renal, and (5) thromboembolic



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

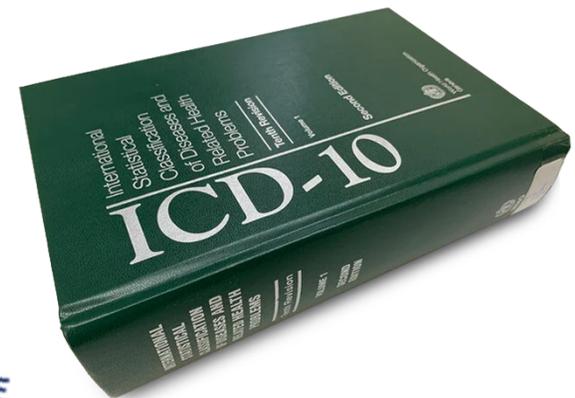


Table 3

Logistic regression on in-hospital mortality following bariatric surgery

Variable of interest	AOR	95% CI	P value
<b>Age class</b>			
Nongeriatric	Ref		
Geriatric (>65 yr)	2.55	1.48–4.38	<.001
<b>Male</b>			
Male	1.85	1.19–2.90	.007
<b>Elixhauser Co-morbidity Index</b>			
Cardiac arrhythmias	3.94	2.23–6.94	<.001
Late-stage chronic kidney disease	5.10	2.32–11.23	<.001
Coagulopathies	7.67	4.42–13.32	<.001
Neurologic disorders	5.48	3.15–9.54	<.001
Pulmonary circulatory disorders	2.54	1.12–5.73	.03
<b>Insurance coverage</b>			
Private	Ref		
Medicare	1.65	.97–2.81	.07
Medicaid	1.51	.77–3.01	.24
Other*	.21	.03–1.56	.13
<b>Income quartile</b>			
Highest	Ref		
Third	1.80	.96–3.36	.07
Second	2.04	1.05–3.97	.04
Lowest	1.67	.82–3.38	.16
<b>Operation type</b>			
Sleeve gastrectomy	Ref		
Gastric bypass	2.86	1.89–4.34	<.001
<b>Hospital location</b>			
Rural	Ref		
Urban, nonacademic	.37	.08–1.62	.19
Urban, academic	.94	.23–3.83	.93

## RESULTS

- Geriatric patients:
  - More frequently male
  - Higher Co-morbidity Index
  - More commonly underwent gastric bypass



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

## RESULTS CONT.

- Higher rates of diabetes (47.4 vs 35.8%,  $P < 0.001$ )
- Higher rates of hypertension (81.9 vs 66.7,  $P < 0.001$ )
- Higher rates of obstructive sleep apnea (57.0 vs 51.9,  $P < 0.001$ )
  
- In-hospital mortality following bariatric surgery in geriatric vs non-geriatric patients (**AOR = 2.55**, 95% CI: 1.48-4.38)
- Mortality of gastric bypass vs sleeve gastrectomy in geriatric patients (**AOR = 2.86**, 95% CI: 1.89-4.34)



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# DISCUSSION

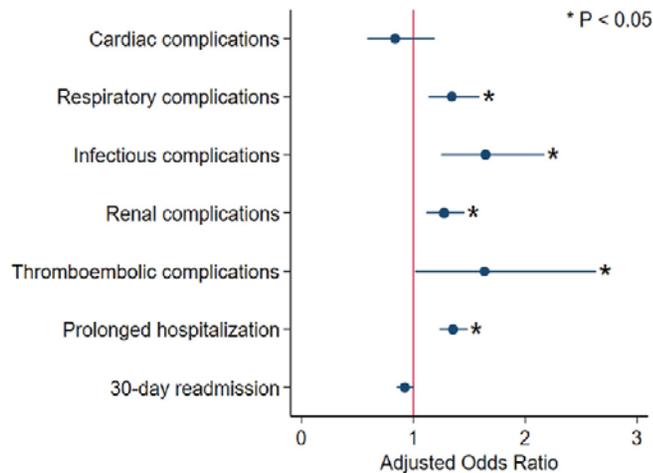


Table 2

Unadjusted postoperative outcomes following bariatric surgery by age class

Variable	Geriatric (n = 44,183)	Nongeriatric (n = 307,109)	P value
In-hospital mortality, %	.3	.04	<.001
Cardiac complications, %	.4	.2	<.001
Respiratory complications, %	1.2	.5	<.001
Infectious complications, %	.7	.2	<.001
Renal complications, %	2.6	1.0	<.001
Thromboembolic complications, %	.2	.1	<.001
Prolonged hospitalization, %	5.6	2.8	<.001
LOS, d	2 [1–2]	2 [1–2]	<.001
Cost, \$1000	12.8 [9.9–17.0]	12.1 [9.3–15.9]	<.001
30-d readmissions, %	5.0	3.7	<.001

LOS = length of stay.

- Increased odds of respiratory, infectious, renal complications
- The geriatric cohort also experienced prolonged hospitalization and hospitalization costs (\$620 more), but no difference in 30-day readmission



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

## DISCUSSION CONT.

- 2.5-fold increase in odds of mortality of geriatric patients compared to younger patients is consistent with the MBSAQIP database
- Authors reference other studies in which bypass is often favored due to better outcomes in terms of weight loss and hypertension remission
  - Xu C, Yan T, Liu H, Mao R, Peng Y, Liu Y. Comparative safety and effectiveness of Roux-en-Y gastric bypass and sleeve gastrectomy in obese elder patients: a systematic review and meta-analysis. *Obes Surg* 2020;30(9):3408–16.
  - Frieder JS, Montorfano L, Gomez CO, et al. Sleeve gastrectomy versus Roux-en-Y gastric bypass in patients aged 65 years: a comparison of short-term outcomes. *Surg Obes Relat Dis* 2021;17(8):1409–15.



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# DISCUSSION CONT.

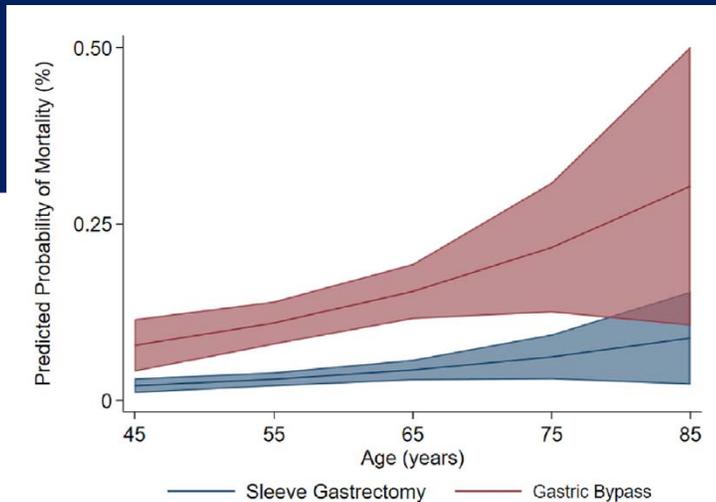


Fig. 2. Association between age and risk-adjusted probability of mortality following bariatric surgery.

- Age-related rise in predicted probability of death more pronounced for gastric bypass compared to sleeve gastrectomy

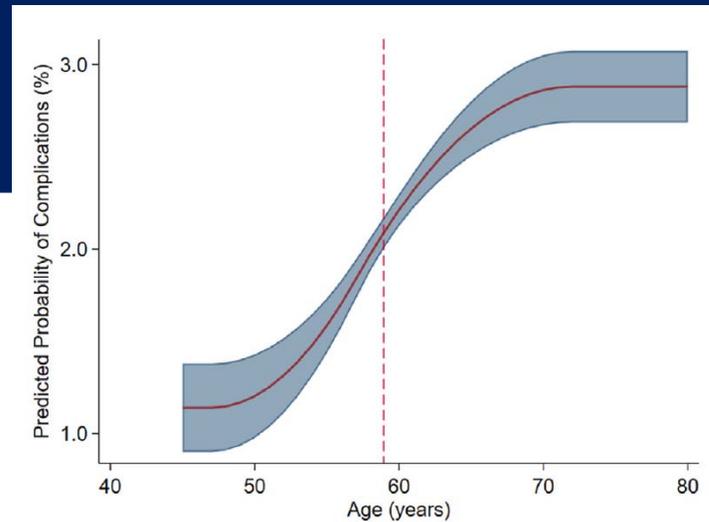


Fig. 4. Spline analysis of predicted probability of complications by age.

- Threshold of 59 yr with most significant increase in risk of total complications



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

<b>Variable</b>	<b>Geriatric (n = 1,863)</b>	<b>Non-Geriatric (n = 1,859)</b>	<b>P-value</b>
In-hospital mortality, %	1.1	0.4	0.008
Cardiac complications, %	1.3	1.2	0.78
Respiratory complications, %	3.4	1.9	0.005
Infectious complications, %	2.1	1.1	0.01
Renal complications, %	6.0	4.5	0.04
Thromboembolic complications, %	0.9	0.8	0.70
Prolonged hospitalization, %	13.6	8.1	<0.001
LOS, days	3.5 ± 0.2	2.9 ± 0.2	0.03
Cost, \$1,000	20.4 ± 0.7	17.9 ± 0.6	0.01
30-day readmissions, %	7.1	6.0	0.22

- Authors also included a supplemental table with balancing of the Geriatric and Non-Geriatric cohorts:
  - No significant difference in odds of 30-day readmission, cardiac complications, and thromboembolic events



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# LIMITATIONS

- Nationwide Readmissions Database is an administrative database
  - Unable to account for clinical variables such as weight or BMI
  - Unable to distinguish primary and reoperative intervention
  - Incidence of complications not requiring admission not included
- Unable to assess effectiveness of bariatric operations for weight loss in the geriatric population



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL

# TAKE HOME MESSAGE

- Despite increased odds of in-hospital mortality and postoperative complications, the overall rates of complication remains low in elderly bariatric patients
- Geriatric patients have greater odds of mortality following gastric bypass compared to sleeve gastrectomy, which should be considered in the counseling and shared decision-making
- Traditionally 65 yr is used as a cutoff for geriatric status, however, the authors observed a threshold of 59 yr to indicate the most significant increase in total complications



DONALD AND BARBARA  
ZUCKER SCHOOL *of* MEDICINE  
AT HOFSTRA/NORTHWELL