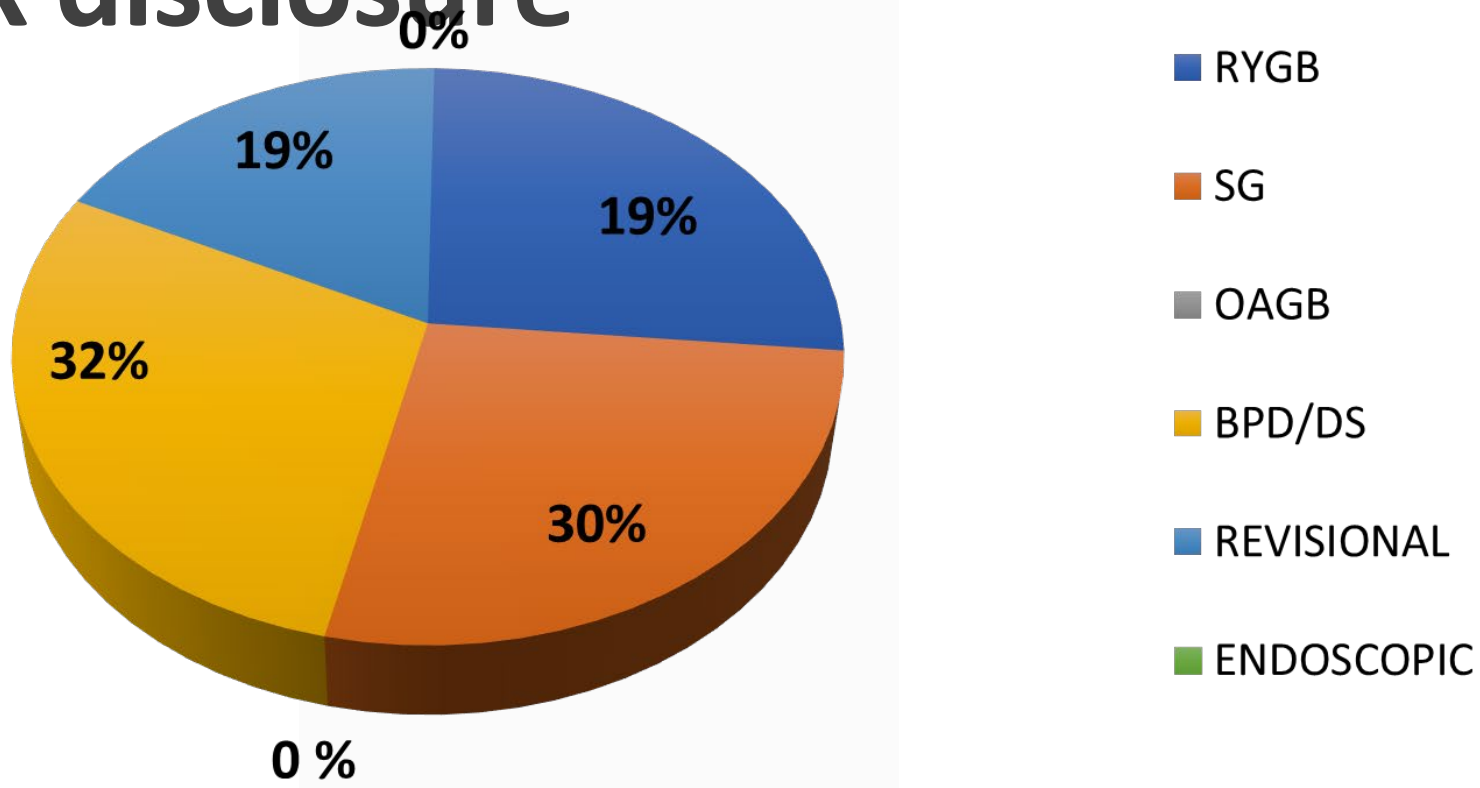
MBS AND ENDSTAGE KIDNEY DISEASE: BRIDGE TO THE TRANSPLANT

FRANCESCO SAVERIO PAPADIA, MD, FACS, FEBS (SURGONC)

DEPARTMENT OF SURGICAL SCIENCES AND INTEGRATED DIAGNOSTICS DISC

UNIVERSITY OF GENOA, ITALY

Case mix disclosure



No financial conflict of interest to disclose

CLINICAL TRANSPLANTATION

THE IMPACT OF BODY MASS INDEX ON RENAL TRANSPLANT OUTCOMES

A SIGNIFICANT INDEPENDENT RISK FACTOR FOR GRAFT FAILURE AND PATIENT DEATH

Meier-Kriesche, Herwig-Ulf[1]; Arndorfer, Julie A.; Kaplan, Bruce

Author Information

Author Information

[1]Address correspondence to: Herwig-Ulf Meier-Kriesche, MD, Associate Professor of Internal Medicine, Division of Nephrology, University of Florida, Shands Hospital, 1600 SW Archer Rd., RM CG-98, Gainesville FL 32610-0224. E-mail meierhu@medicine.ufl.edu.

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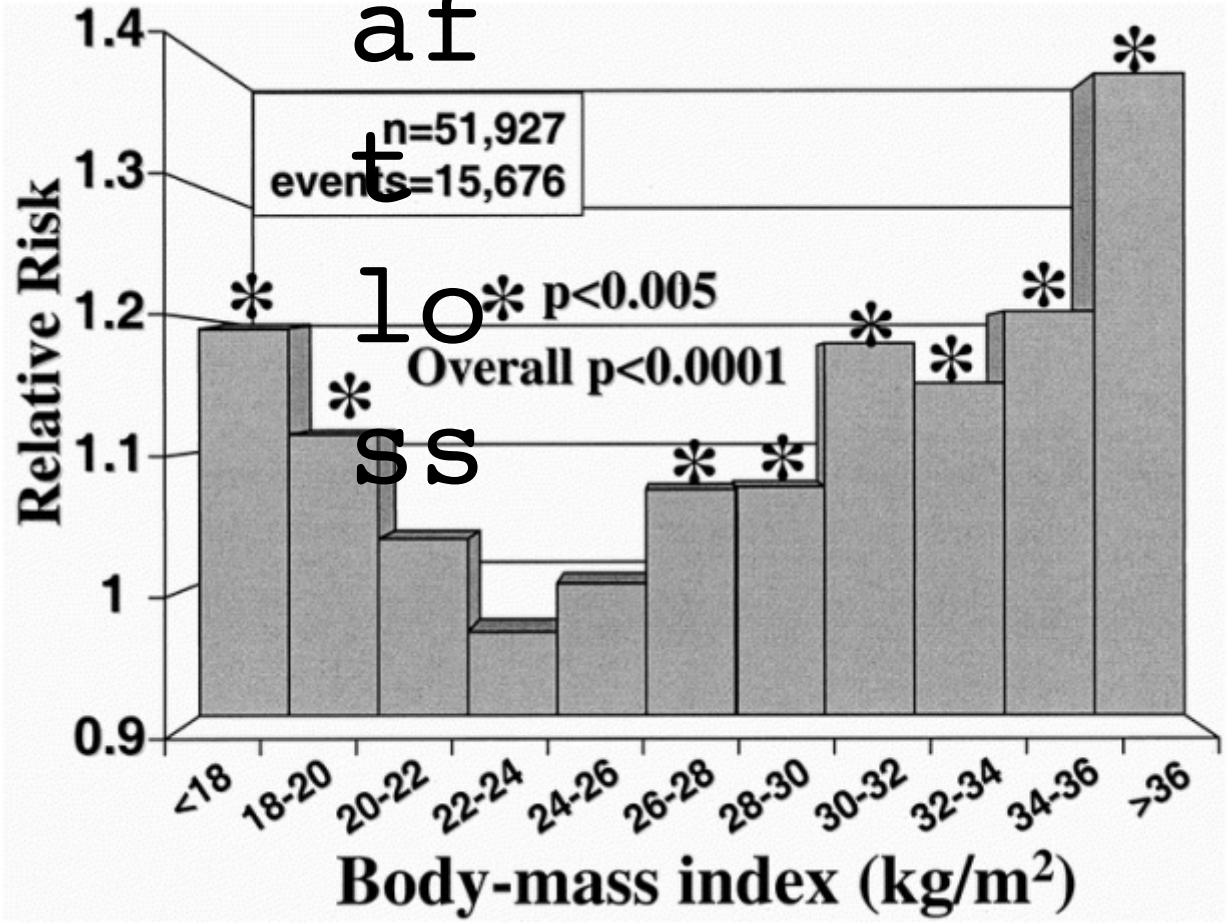
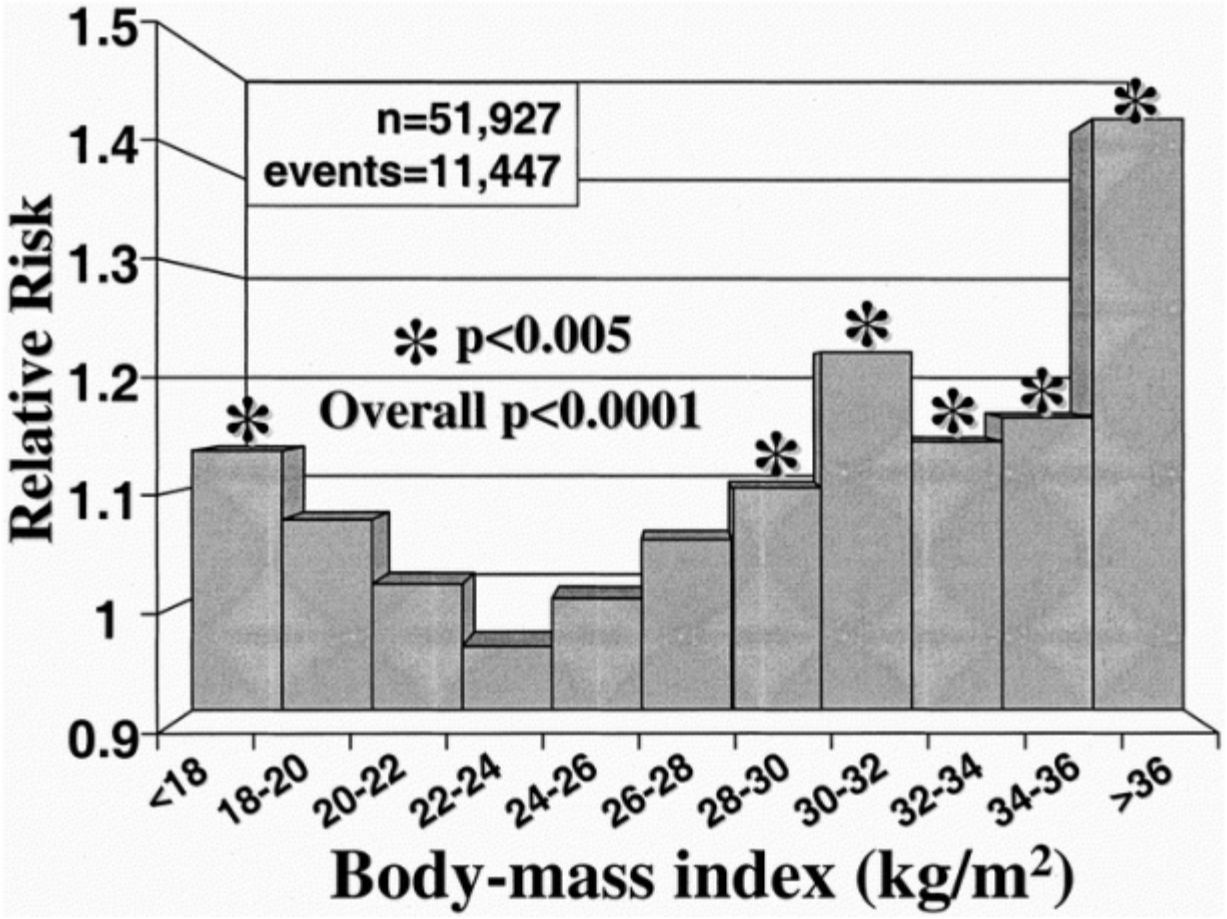
Grafotloss


1.4
1.3
1.2
1.1
1
0.9
Relative Risk
n=51,927
events=15,676
* p<0.005
Overall p<0.0001
<18
18-20
20-22
22-24
24-26
26-28
28-30
30-32
32-34
34-36
>36
Body-mass index (kg/m²)

Overall


1.5
1.4
1.3
1.2
1.1
1
0.9
Relative Risk
n=51,927
events=11,447
* p<0.005
Overall p<0.0001
<18
18-20
20-22
22-24
24-26
26-28
28-30
30-32
32-34
34-36
>36
Body-mass index (kg/m²)

Obesity and kidney transplant

Bariatric surgery:

- BMI 30-35 kg/m^2 with complications
- BMI >35 uncomplicated

Transplant surgery criteria:

- Donor < 35 kg/m^2
- Recipient < 40 kg/m^2 (preferable, < 35)

Is there a role for MBS in patients with chronic kidney failure?

Original Investigation

FREE

May 27, 2020

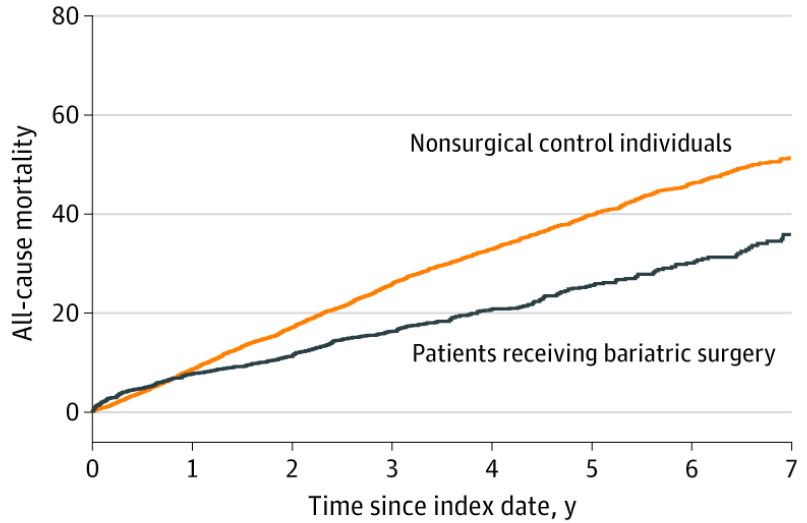
Bariatric Surgery and Long-term Survival in Patients With Obesity and End-stage Kidney Disease

Kyle H. Sheetz, MD, MSc[1,2]; Laura Gerhardinger, MS[2]; Justin B. Dimick, MD, MPH[1,2]; et al

» Author Affiliations | Article Information

JAMA Surg. 2020;155(7):581-588. doi:10.1001/jamasurg.2020.0829

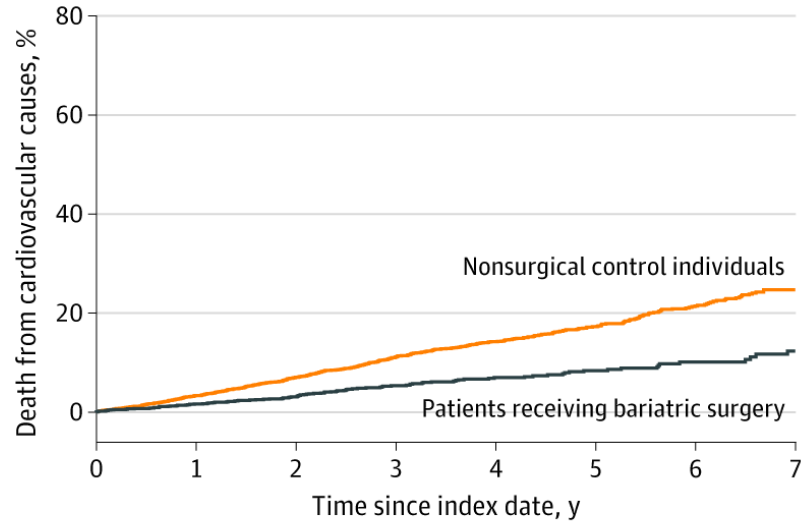
A All-cause mortality



No. at risk

Group = 0	4486	4026	3397	2264	1426	905	532	296
Group = 1	1596	1462	1289	902	590	397	247	134

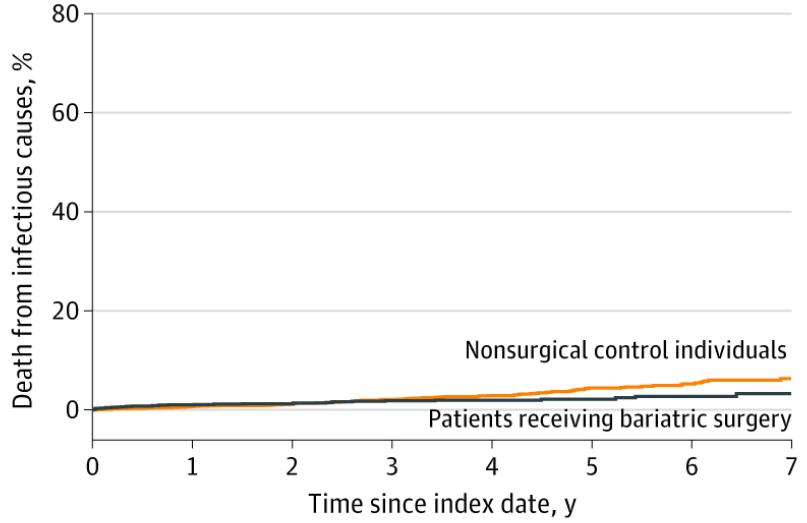
B Death from cardiovascular causes



No. at risk

Group = 0	4486	4026	3397	2264	1426	905	532	296
Group = 1	1596	1462	1289	902	590	397	247	134

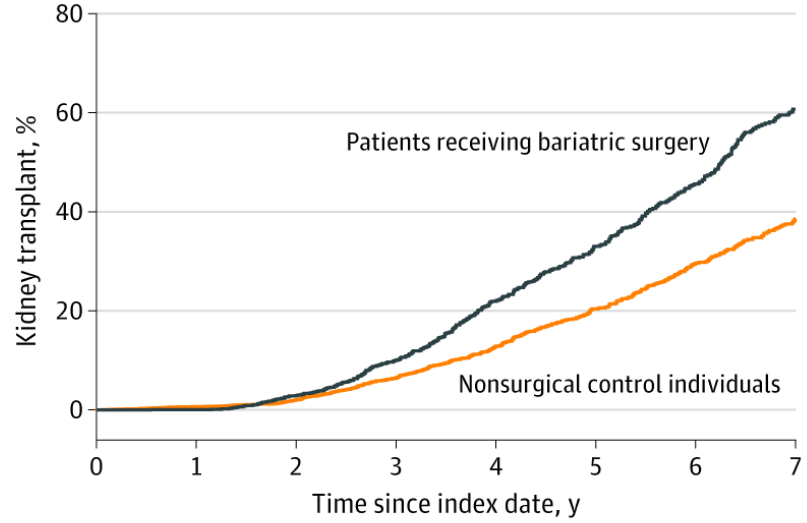
C Death from infectious causes



No. at risk

Group = 0	4486	4026	3397	2264	1426	905	532	296
Group = 1	1596	1462	1289	902	590	397	247	134

D Cumulative incidence of kidney transplant

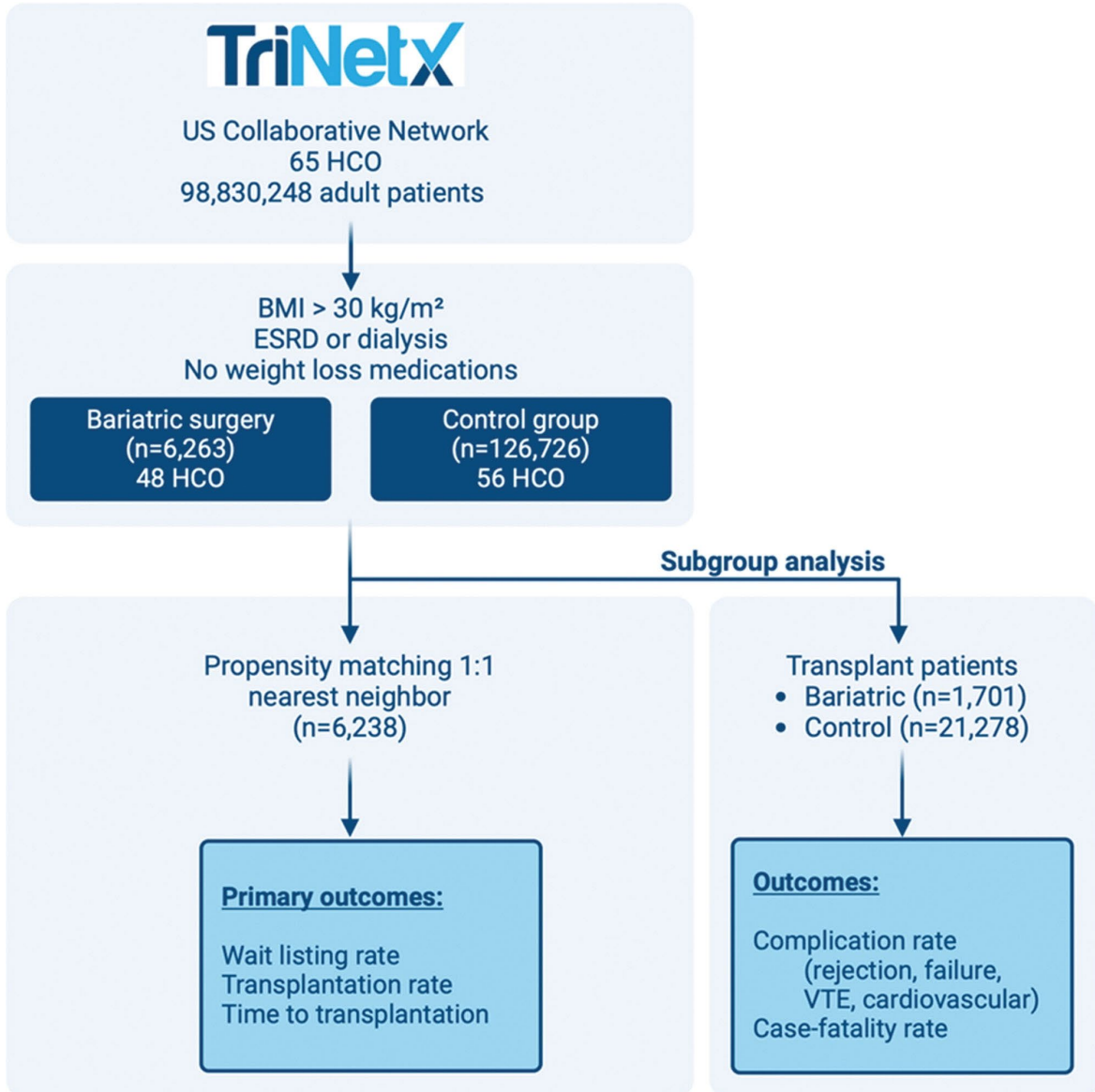


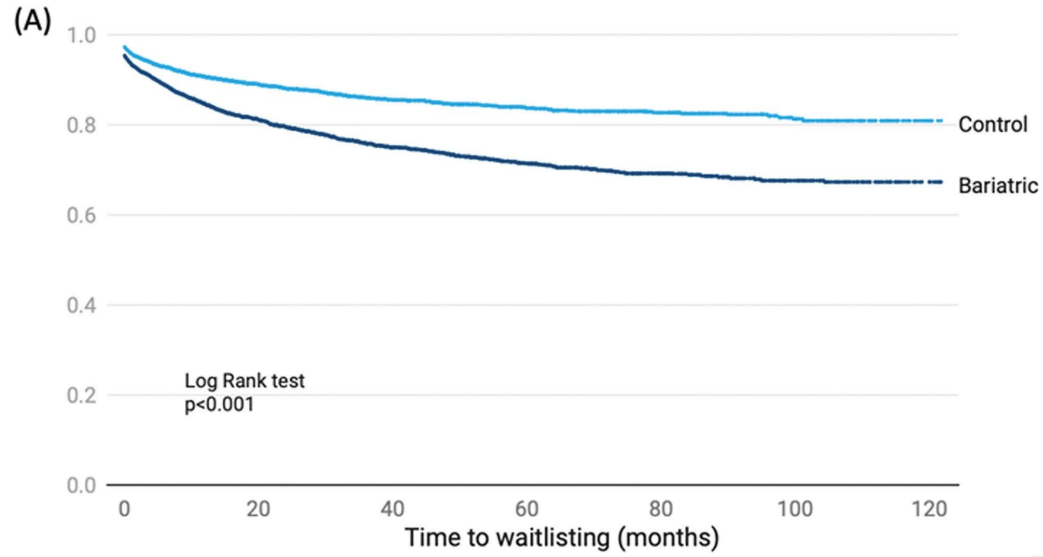
No. at risk

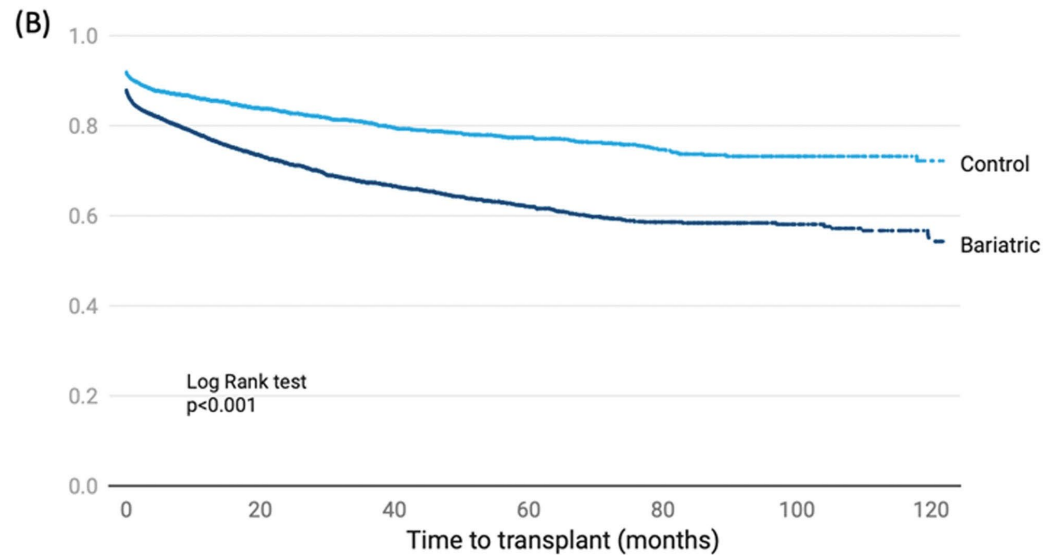
Group = 0	4486	4026	3397	2264	1426	905	532	296
Group = 1	1596	1426	1289	902	590	397	247	134

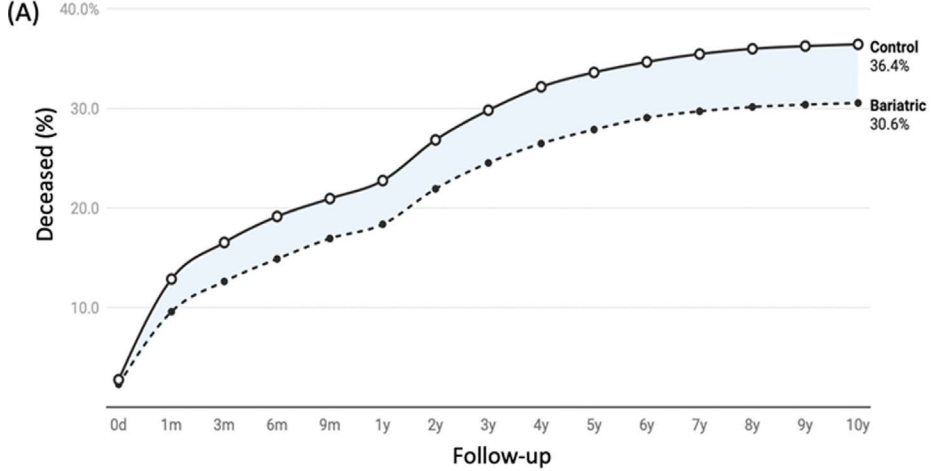
Metabolic and Bariatric Operation and the Path to Kidney Transplantation

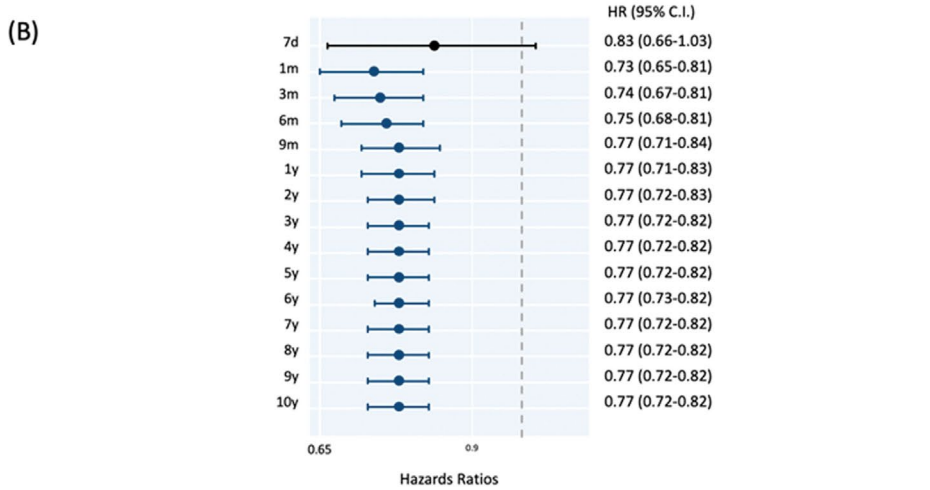
Abdallah Attia, MD, Eman A Toraih, MD, PhD, Claire Ardis, MS, Mahmoud Omar, MD, Ahmed Abdelmaksoud, MD, Danielle Tatum, PhD, Mary Killackey, MD, FACS, Shauna Levy, MD, FACS, MS, Anil Paramesh, MD, FACS

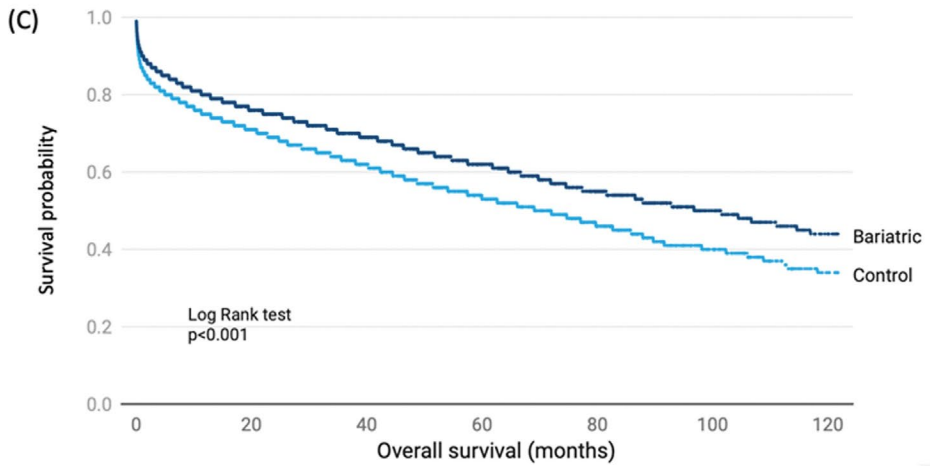

TriNetX
US Collaborative Network
65 HCO
98,830,248 adult patients
BMI > 30 kg/m²
ESRD or dialysis
No weight loss medications
Bariatric surgery
(n=6,263)
48 HCO
Control group
(n=126,726)
56 HCO
Subgroup analysis
Propensity matching 1:1
nearest neighbor
(n=6,238)
Transplant patients
• Bariatric (n=1,701)
• Control (n=21,278)
Primary outcomes:
Wait listing rate
Transplantation rate
Time to transplantation
Outcomes:
Complication rate
(rejection, failure,
VTE, cardiovascular)
Case-fatality rate

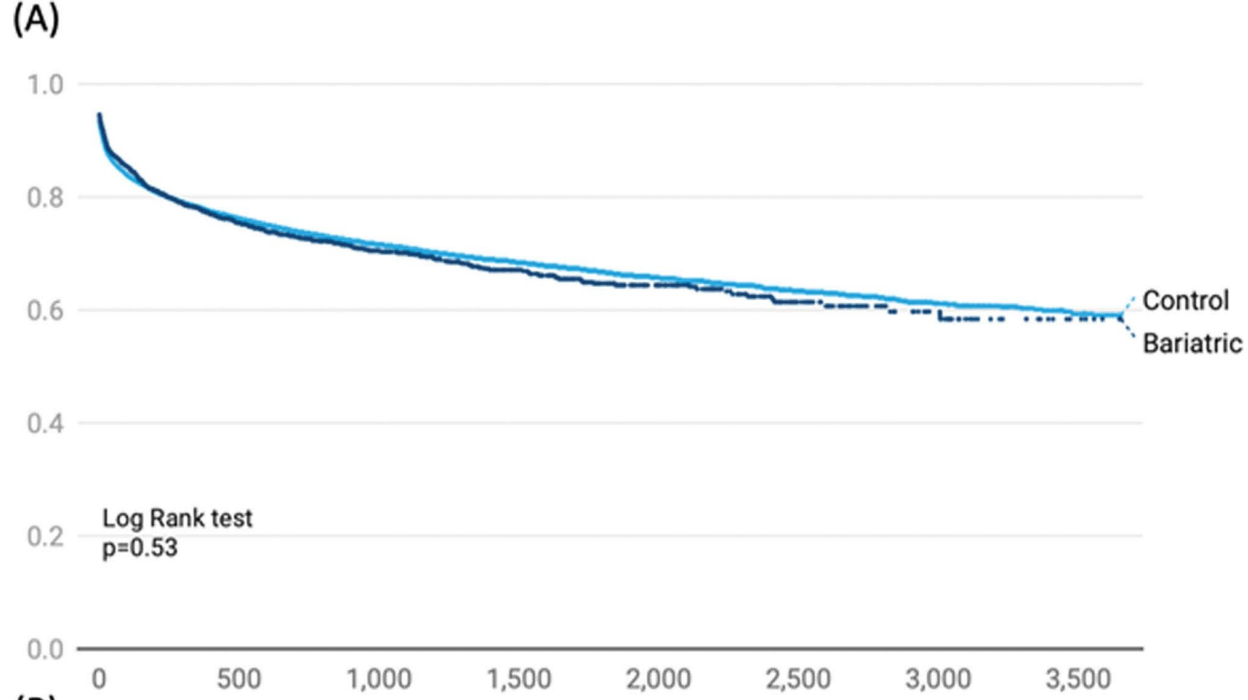

(A)
1.0
0.8
0.6
0.4
0.2
0.0
Control
Bariatric
Log Rank test
p<0.001
0
20
40
60
80
100
120
Time to waitlisting (months)

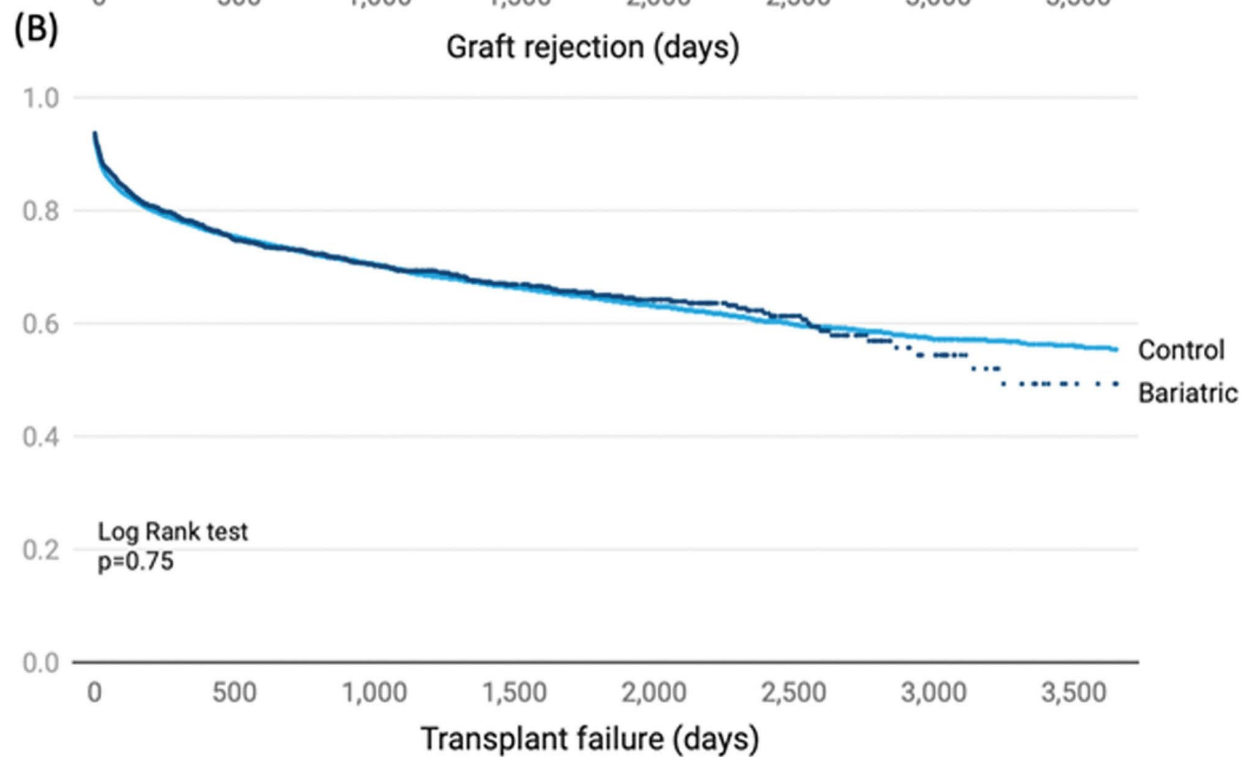

(B)
1.0
0.8
0.6
0.4
0.2
0.0
Control
Bariatric
Log Rank test
p<0.001
0
20
40
60
80
100
120
Time to transplant (months)

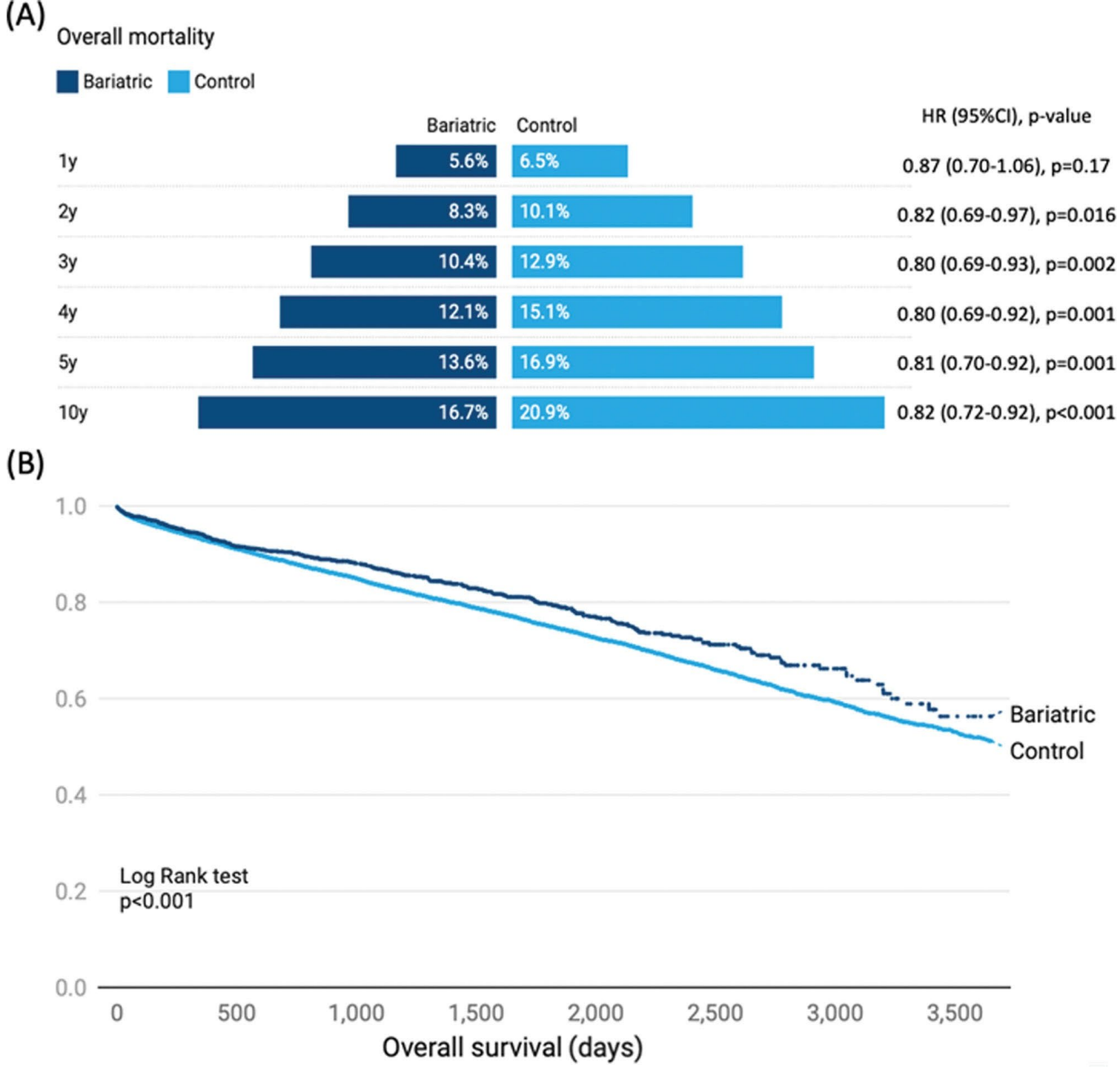

(A)
40.0%
30.0
20.0
10.0
Deceased (%)
Control
36.4%
Bariatric
30.6%
0d
1m
3m
6m
9m
1y
2y
3y
4y
5y
6y
7y
8y
9y
10y
Follow-up


(B)
HR (95% C.I.)
7d 0.83 (0.66-1.03)
1m 0.73 (0.65-0.81)
3m 0.74 (0.67-0.81)
6m 0.75 (0.68-0.81)
9m 0.77 (0.71-0.84)
1y 0.77 (0.71-0.83)
2y 0.77 (0.72-0.83)
3y 0.77 (0.72-0.82)
4y 0.77 (0.72-0.82)
5y 0.77 (0.72-0.82)
6y 0.77 (0.73-0.82)
7y 0.77 (0.72-0.82)
8y 0.77 (0.72-0.82)
9y 0.77 (0.72-0.82)
10y 0.77 (0.72-0.82)
0.65
0.9
Hazards Ratios


(C)
1.0
0.8
0.6
0.4
0.2
0.0
Survival probability
Bariatric
Control
Log Rank test
p<0.001
0
20
40
60
80
100
120
Overall survival (months)


(A)
1.0
0.8
0.6
0.4
0.2
0.0
Control
Bariatric
Log Rank test
p=0.53
0
500
1,000
1,500
2,000
2,500
3,000
3,500
Graft rejection (days)


(B)
1.0
0.8
0.6
0.4
0.2
0.0
Control
Bariatric
Log Rank test
p=0.75
0
500
1,000
1,500
2,000
2,500
3,000
3,500
Transplant failure (days)


(A)
Overall mortality
Bariatric
Control
Bariatric
Control
HR (95%CI), p-value
1y
5.6%
6.5%
0.87 (0.70-1.06), p=0.17
2y
8.3%
10.1%
0.82 (0.69-0.97), p=0.016
3y
10.4%
12.9%
0.80 (0.69-0.93), p=0.002
4y
12.1%
15.1%
0.80 (0.69-0.92), p=0.001
5y
13.6%
16.9%
0.81 (0.70-0.92), p=0.001
10y
16.7%
20.9%
0.82 (0.72-0.92), p<0.001
(B)
1.0
0.8
0.6
0.4
0.2
0.0
Bariatric
Control
Log Rank test
p<0.001
0
500
1,000
1,500
2,000
2,500
3,000
3,500
Overall survival (days)

Metabolic and Bariatric Surgery and the Path to Kidney Transplantation

1:1 matching of end-stage renal disease (ESRD) patients with obesity (n = 6238/group) obtained from TriNetX database

Control (No MBS)		MBS
10.5%	Waitlist placement	19.1%*
16.1%	Transplantation	27.1%*
36.4%	10-Year overall mortality	30.5%*

* Indicates $p<0.05$

Metabolic bariatric surgery (MBS) in patients with ESRD improves access to kidney transplantation

Attia et al, *J Am Coll Surg*, April 2025

JACS JOURNAL OF THE AMERICAN COLLEGE OF SURGEONS

Timing of kidney transplant a

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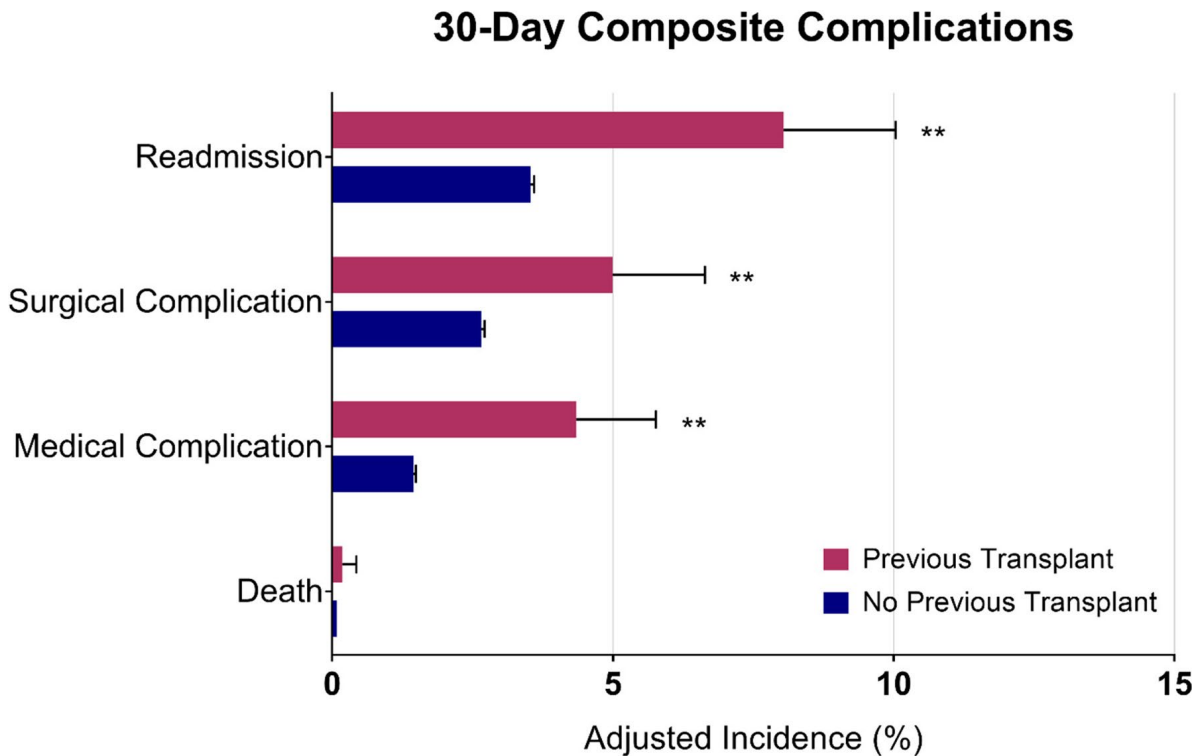
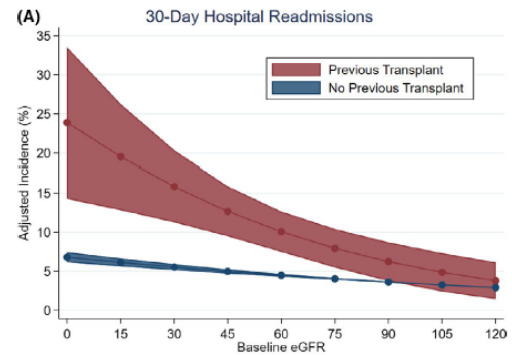
ORIGINAL ARTICLE

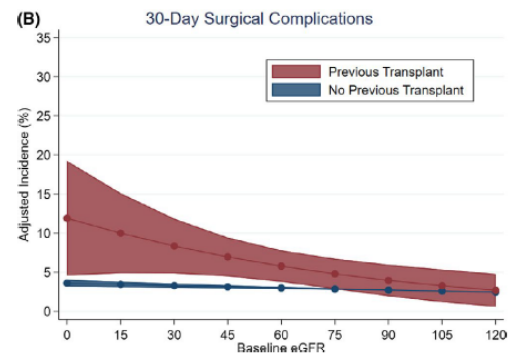
AJT

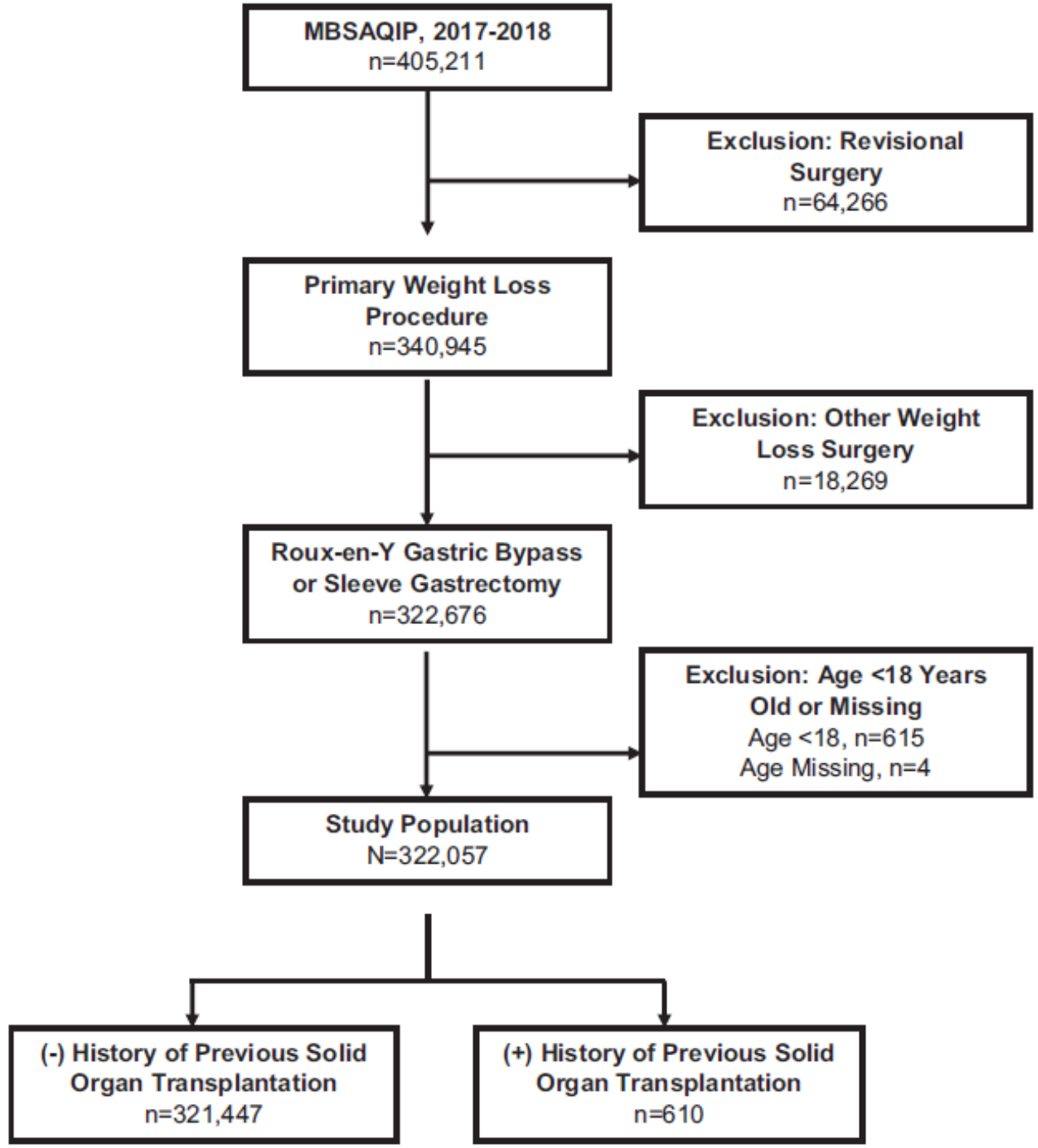
Perioperative risks of bariatric surgery among patients with and without history of solid organ transplant

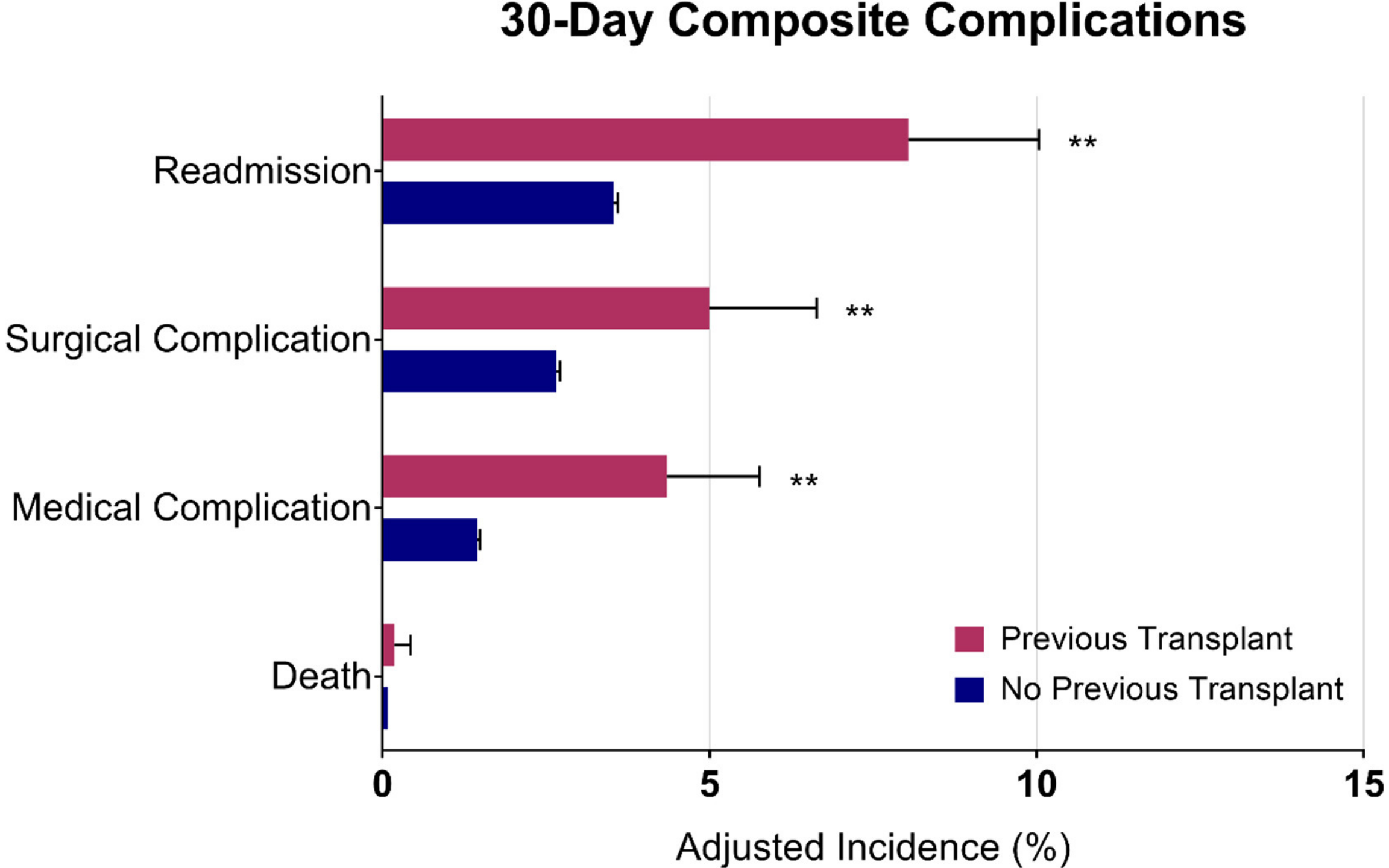
John R. Montgomery[1] | Jordan A. Cohen[2] | Craig S. Brown[1] | Kyle H. Sheetz[1] | Grace F. Chao[3,4] | Seth A. Waits[5] | Dana A. Telem[1]







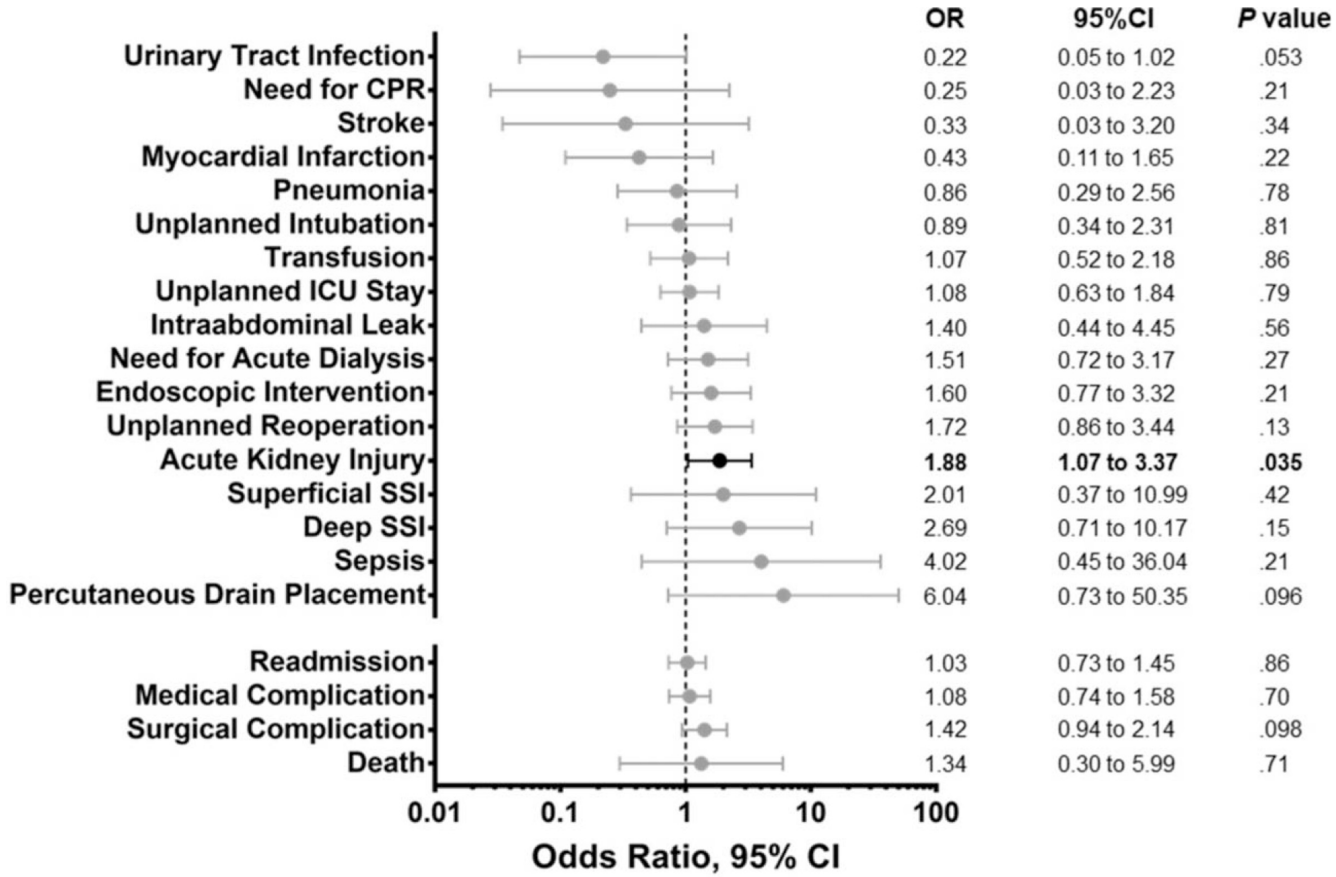

MBSAQIP, 2017-2018
n=405,211
Exclusion: Revisional Surgery
n=64,266
Primary Weight Loss Procedure
n=340,945
Exclusion: Other Weight Loss Surgery
n=18,269
Roux-en-Y Gastric Bypass or Sleeve Gastrectomy
n=322,676
Exclusion: Age <18 Years Old or Missing
Age <18, n=615
Age Missing, n=4
Study Population
N=322,057
(-) History of Previous Solid Organ Transplantation
n=321,447
(+) History of Previous Solid Organ Transplantation
n=610

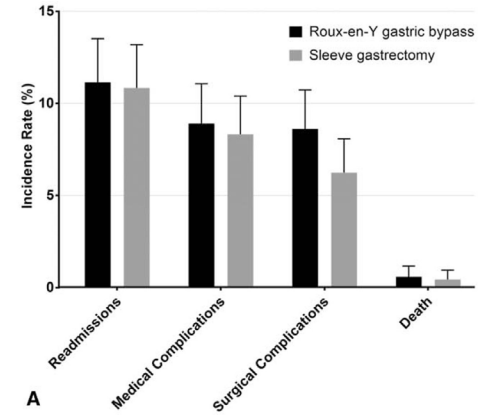

30-Day Composite Complications
Readmission
Surgical Complication
Medical Complication
Death
**
**
**
Previous Transplant
No Previous Transplant
0
5
10
15
Adjusted Incidence (%)

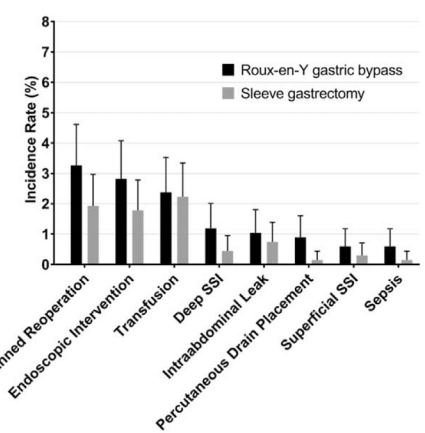
Perioperative Risks of Sleeve Gastrectomy Versus Roux-en-Y Gastric Bypass Among Patients With Chronic Kidney Disease

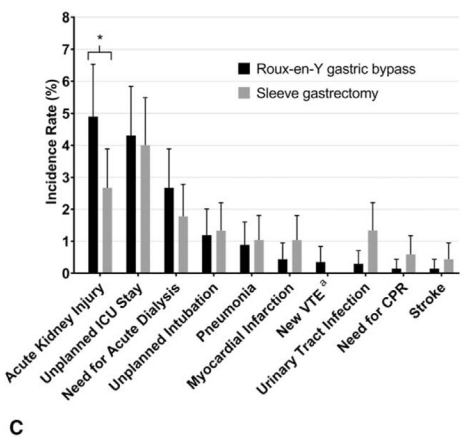
A Review of the MBSAQIP Database

John R. Montgomery, MD,†✉ Seth A. Waits, MD,* Justin B. Dimick, MD, MPH,*† and Dana A. Telem, MD, MPH*†*









http://www.kidney-international.org

see commentary on page 8

Hyperoxaluric nephrolithiasis is a complication of Roux-en-Y gastric bypass surgery

MK Sinha[1], ML Collazo-Clavell[2], A Rule[3], DS Milliner[3], W Nelson[4], MG Sarr[5], R Kumar[2,3,6] and JC Lieske[3,7]

[1]Department of Internal Medicine, Mayo Clinic College of Medicine, Rochester, Minnesota, USA; [2]Division of Endocrinology, Diabetes, Metabolism and Nutrition, Department of Internal Medicine, Mayo Clinic College of Medicine, Rochester, Minnesota, USA; [3]Division of Nephrology and Hypertension, Department of Internal Medicine, Mayo Clinic College of Medicine, Rochester, Minnesota, USA; [4]Mayo Medical School, Mayo Clinic College of Medicine, Rochester, Minnesota, USA; [5]Department of Surgery, Mayo Clinic College of Medicine, Rochester, Minnesota, USA; [6]Department of Biochemistry and Molecular Biology, Mayo Clinic College of Medicine, Rochester, Minnesota, USA and [7]Department of Laboratory Medicine and Pathology, Mayo Clinic College of Medicine, Rochester, Minnesota, USA

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J Urol. 2010 March ; 183(3): 1026–1030. doi:10.1016/j.juro.2009.11.022.

Hypocitraturia and Hyperoxaluria After Roux-en-Y Gastric Bypass Surgery

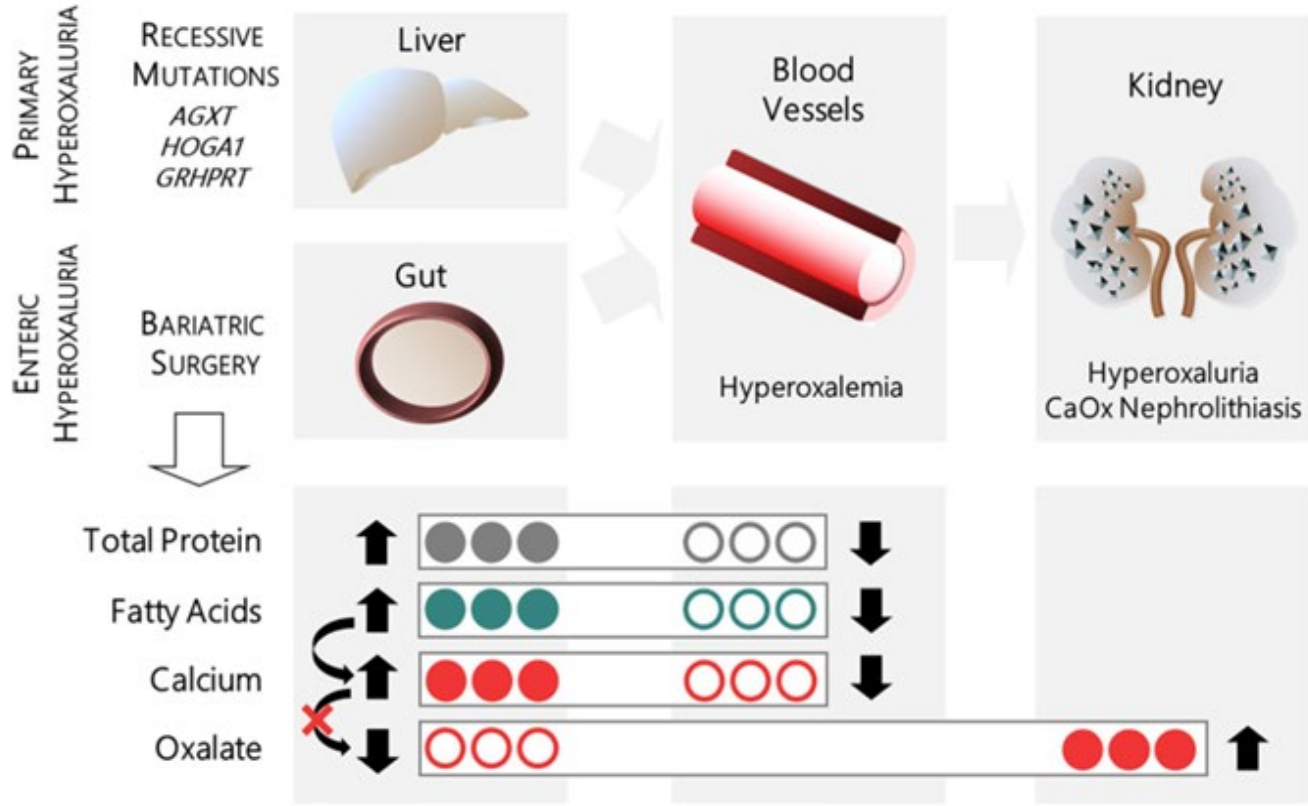
Naim M. Maalouf[*], **Prasanthi Tondapu**, **Eve S. Guth**, **Edward H. Livingston**, and **Khashayar Sakhaee**
Department of Internal Medicine (NMM, PT, ESG, KS), Charles and Jane Pak Center for Mineral Metabolism and Clinical Research (NMM, PT, KS) and Department of Surgery (EHL), University of Texas Southwestern Medical Center, Dallas, Texas

*"….Almost **half of patients with Roux-en-Y gastric bypass** without a history of nephrolithiasis showed hyperoxaluria or hypocitraturia….. This **prevalence was significantly higher than in body mass index matched** controls. These risk factors were negated by **lower urine calcium excretion in patients with Roux-en-Y***

OPEN

Delta weight loss unlike genetic variation associates with hyperoxaluria after malabsorptive bariatric surgery

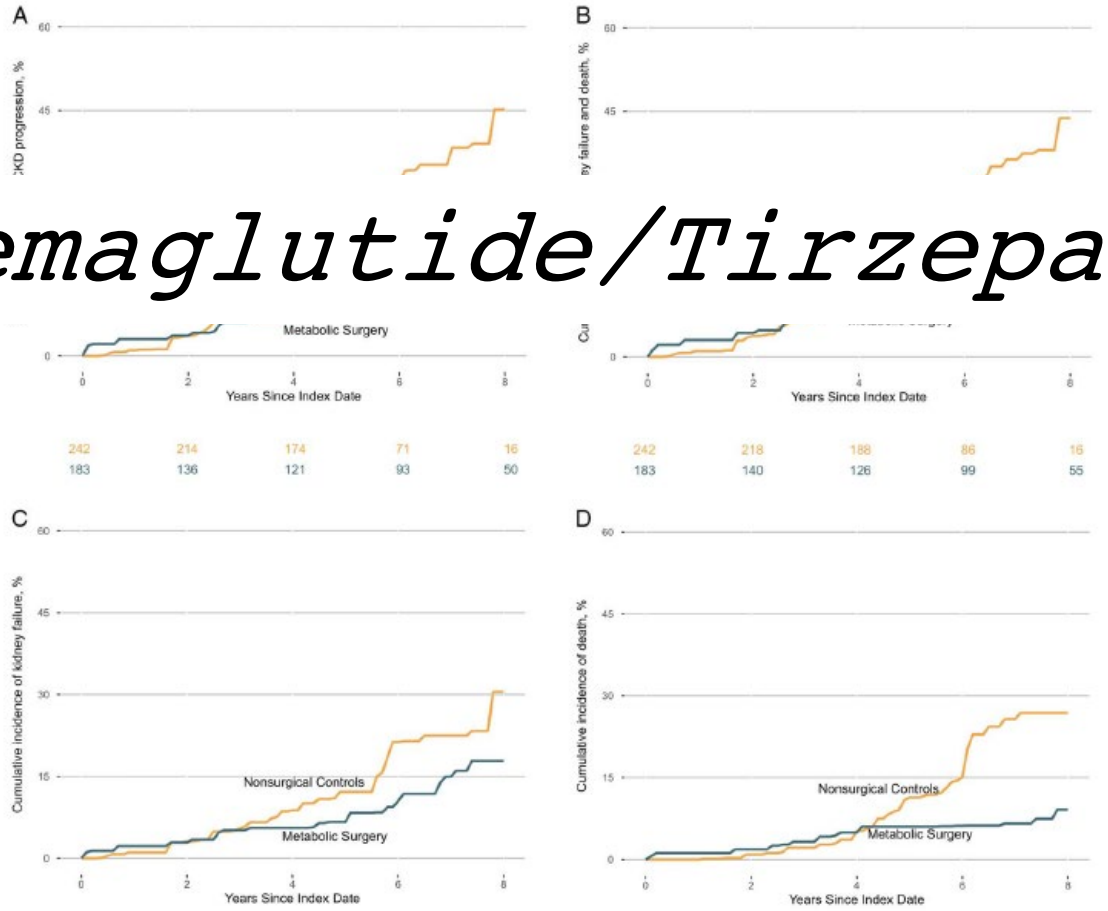
Lotte Scherer[1,4], Ria Schönauer[1,2,4], Melanie Nemitz-Kliemchen[2], Tobias Hagemann[3], Elena Hantmann[2], Jonathan de Fallois[1], Friederike Petzold[1], Matthias Blüher[3] & Jan Halbritter[1,2]✉



How does MBS compare to OMMs?

Renoprotective Effects of Metabolic Surgery Versus GLP1 Receptor Agonists on Progression of Kidney Impairment in Patients with Established Kidney Disease

Ali Aminian, MD,✉ Hamlet Gasoyan, PhD,† Alexander Zajichek, MS,‡ Mohammad Hesam Alavi, MD, MPH,* Nicholas J. Casacchia, PharmD, MSc,† Rickesha Wilson, MD,* Xiaoxi Feng, MD,* Ricard Corcelles, MD,* Stacy A. Brethauer, MD, MBA,§ Philip R. Schauer, MD,‖ Matthew Kroh, MD,* Raul J. Rosenthal, MD,¶ Jonathan J. Taliercio, DO,# Emilio D. Poggio, MD,# Steven E. Nissen, MD,** and Michael B. Rothberg, MD, MPH†*



Semaglutide/Tirzepatide 16,8%)

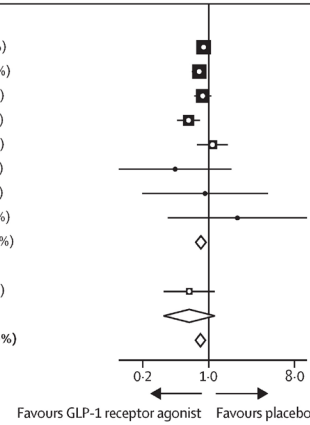
Effects of GLP-1 receptor agonists on kidney and cardiovascular disease outcomes: a meta-analysis of randomised controlled trials

Sunil V Badve, Anika Bilal, Matthew M Y Lee, Naveed Sattar, Hertzel C Gerstein, Christian T Ruff, John J V McMurray, Peter Rossing, George Bakris, Kenneth W Mahaffey, Johannes F E Mann, Helen M Colhoun, Katherine R Tuttle, Richard E Pratley, Vlado Perkovic

A Composite kidney outcome

	GLP-1 receptor agonist (n/N [%])	Placebo (n/N [%])	Hazard ratio (95% CI)	Weight (%)
With diabetes				
EXSCEL[40]	246/6459 (3·8%)	273/6466 (4·2%)	0·88 (0·74–1·05)	25·22%
FLOW[26]	218/1767 (12·3%)	260/1766 (14·7%)	0·79 (0·66–0·94)	24·94%
LEADER[24,33]	184/4668 (3·9%)	212/4672 (4·5%)	0·86 (0·70–1·05)	21·36%
REWIND[23,35]	84/4949 (1·7%)	136/4952 (2·7%)	0·61 (0·46–0·80)	14·08%
SUSTAIN-6[25,41]	58/1648 (3·5%)	57/1649 (3·5%)	1·09 (0·75–1·58)	8·94%
ELIXA[37]	3/2702 (0·1%)	7/2793 (0·3%)	0·44 (0·11–1·73)	0·77%
AMPLITUDE-O[39]	9/2717 (0·3%)	3/1359 (0·2%)	0·91 (0·20–4·19)	0·62%
Harmony Outcomes[38]	4/4731 (0·1%)	2/4732 (<0·1%)	2·00 (0·37–10·87)	0·51%
Subtotal	806/29 441 (2·7%)	950/28 389 (3·3%)	0·82 (0·73–0·93)	
Without diabetes				
SELECT[27,42]	17/8803 (0·2%)	27/8801 (0·3%)	0·62 (0·33–1·15)	3·56%
			0·62 (0·33–1·15)	
Overall	**823/38 244 (2·2%)**	**977/37 190 (2·6%)**	**0·81 (0·72–0·92)**	

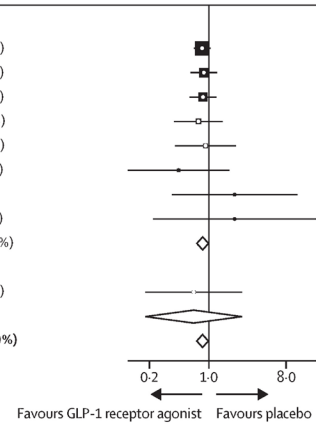
With diabetes p<0·001, I^2=26·41%
Without diabetes p=0·13
Overall p<0·001, I^2=23·11%
Heterogeneity by diabetes status p=0·38



B Kidney failure

With diabetes				
FLOW[26]	142/1767 (8·0%)	165/1766 (9·3%)	0·83 (0·66–1·04)	48·99%
LEADER[24,33]	56/4668 (1·2%)	64/4672 (1·4%)	0·87 (0·61–1·24)	19·28%
EXSCEL[40]	55/6259 (0·9%)	65/6230 (1·0%)	0·85 (0·59–1·22)	18·39%
REWIND[23,35]	16/4949 (0·3%)	21/4952 (0·4%)	0·75 (0·39–1·44)	5·69%
SUSTAIN-6[25,41]	11/1648 (0·7%)	12/1649 (0·7%)	0·91 (0·40–2·07)	3·59%
ELIXA[37]	3/2702 (0·1%)	7/2793 (0·3%)	0·44 (0·11–1·73)	1·29%
Harmony Outcomes[38]	4/4731 (0·1%)	2/4732 (0%)	2·00 (0·37–10·87)	0·85%
AMPLITUDE-O[39]	4/2717 (0·1%)	1/1359 (0·1%)	2·00 (0·22–18·06)	0·50%
Subtotal	291/29 441 (1·0%)	337/28 389 (1·2%)	0·84 (0·72–0·99)	
Without diabetes				
SELECT[27,42]	4/8803 (<0·1%)	6/8801 (0·1%)	0·66 (0·18–2·44)	1·42%
			0·66 (0·18–2·44)	
Overall	**295/38 244 (0·8%)**	**343/37 190 (0·9%)**	**0·84 (0·72–0·98)**	

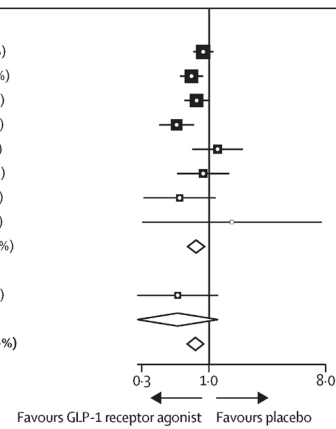
With diabetes p=0·03, I^2=0%
Without diabetes p=0·53
Overall p=0·03, I^2=0%
Heterogeneity by diabetes status p=0·72



C Worsening of kidney function

With diabetes				
EXSCEL[40]	239/6259 (3·8%)	266/6466 (4·1%)	0·90 (0·75–1·07)	22·42%
FLOW[26]	165/1767 (9·3%)	213/1766 (12·1%)	0·73 (0·59–0·90)	20·17%
LEADER[24,33]	149/4668 (3·2%)	184/4672 (3·9%)	0·80 (0·64–0·99)	19·21%
REWIND[23,35]	61/4949 (1·2%)	108/4952 (2·2%)	0·56 (0·41–0·76)	13·47%
ELIXA[25,46]	41/3031 (1·4%)	35/3032 (1·2%)	1·16 (0·74–1·83)	8·03%
SUSTAIN-6[25,41]	33/1648 (2·0%)	40/1649 (2·4%)	0·90 (0·57–1·43)	7·70%
PIONEER 6[34]	15/1591 (0·9%)	25/1592 (1·6%)	0·59 (0·31–1·12)	4·50%
AMPLITUDE-O[39]	6/2717 (0·2%)	2/1359 (0·1%)	1·50 (0·30–7·45)	0·82%
Subtotal	709/26 630 (2·7%)	873/25 488 (3·3%)	0·79 (0·68–0·92)	
Without diabetes				3·68%
SELECT[27,42]	12/8724 (0·1%)	21/8742 (0·2%)	0·57 (0·28–1·17)	
			0·57 (0·28–1·17)	
Overall	**721/35 354 (2%)**	**894/34 230 (2·6%)**	**0·78 (0·68–0·91)**	

With diabetes p<0·001, I^2=42·66%
Without diabetes p=0·13
Overall p<0·001, I^2=39%
Heterogeneity by diabetes status p=0·38



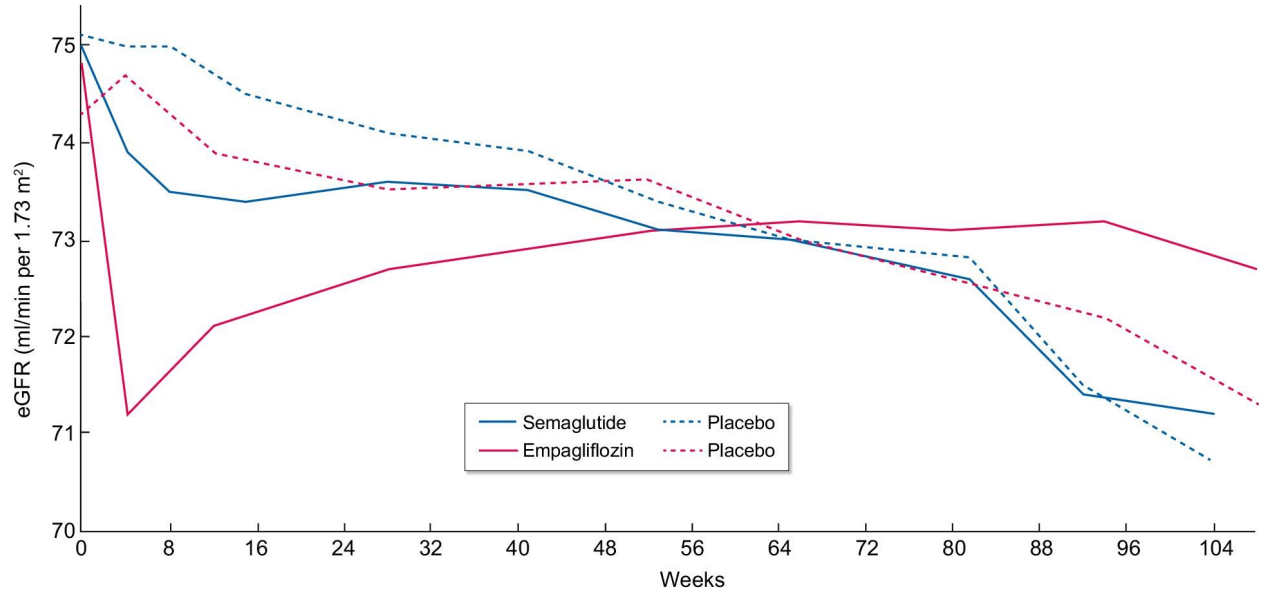
Conclusions

- Obesity is a risk factor for ESKD and for renal transplant, as well as for graft loss
- Substantial weight loss favourably impacts eligibility to kidney transplant
- MBS in ESKD can be performed with (relative) safety
- OMM show promising results, but long-term results are lacking, and are possibly not suitable for all patients
- Probably best MBS first, then transplant
- SG probably more adequate than RYGB

Thank you for your attention!

francesco.papadia@unige.it

Figure 8: The early decrease in eGFR induced by SGLT2is and GLP-1 RAs appears to differ in magnitude. Results are ...



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