Next Generation Metabolic Surgery

IFSO Sept 4, 2024

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Presenter Disclosure

Philip R. Schauer MD

Board Member/Advisory Panel – GI Dynamics; Persona; Keyron, Mediflix

Consultant – Ethicon, Medtronic, Keyron, Novo Nordisk, Lilly, Heron

Research Support – Ethicon, NIH, Medtronic, Pacira;

Stock/Shareholder - SEHQC, LLC

Clinical Trials (Last 2 Years):

STAMPEDE

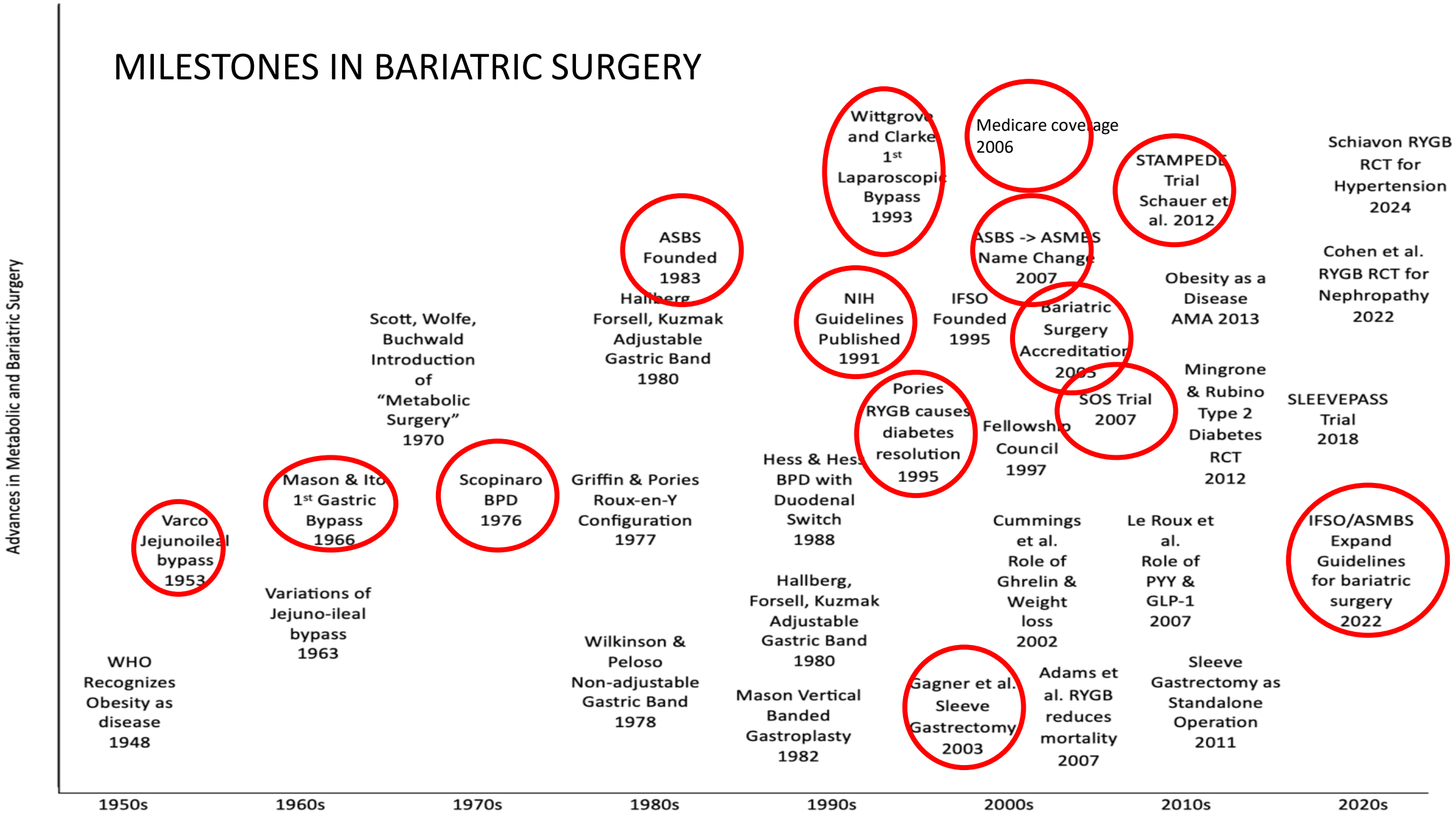
MS-MACE

ARMMS

SPLENDOR-NASH

SPLENDID-Cancer

MILESTONES IN BARIATRIC SURGERY



Corpodean F, Kachmar M, Albaugh V, Schauer P. SAGES Manual of Bariatric Surgery 2024, in press

WELCOME TO THE ERA OF GLP1-RA'S!

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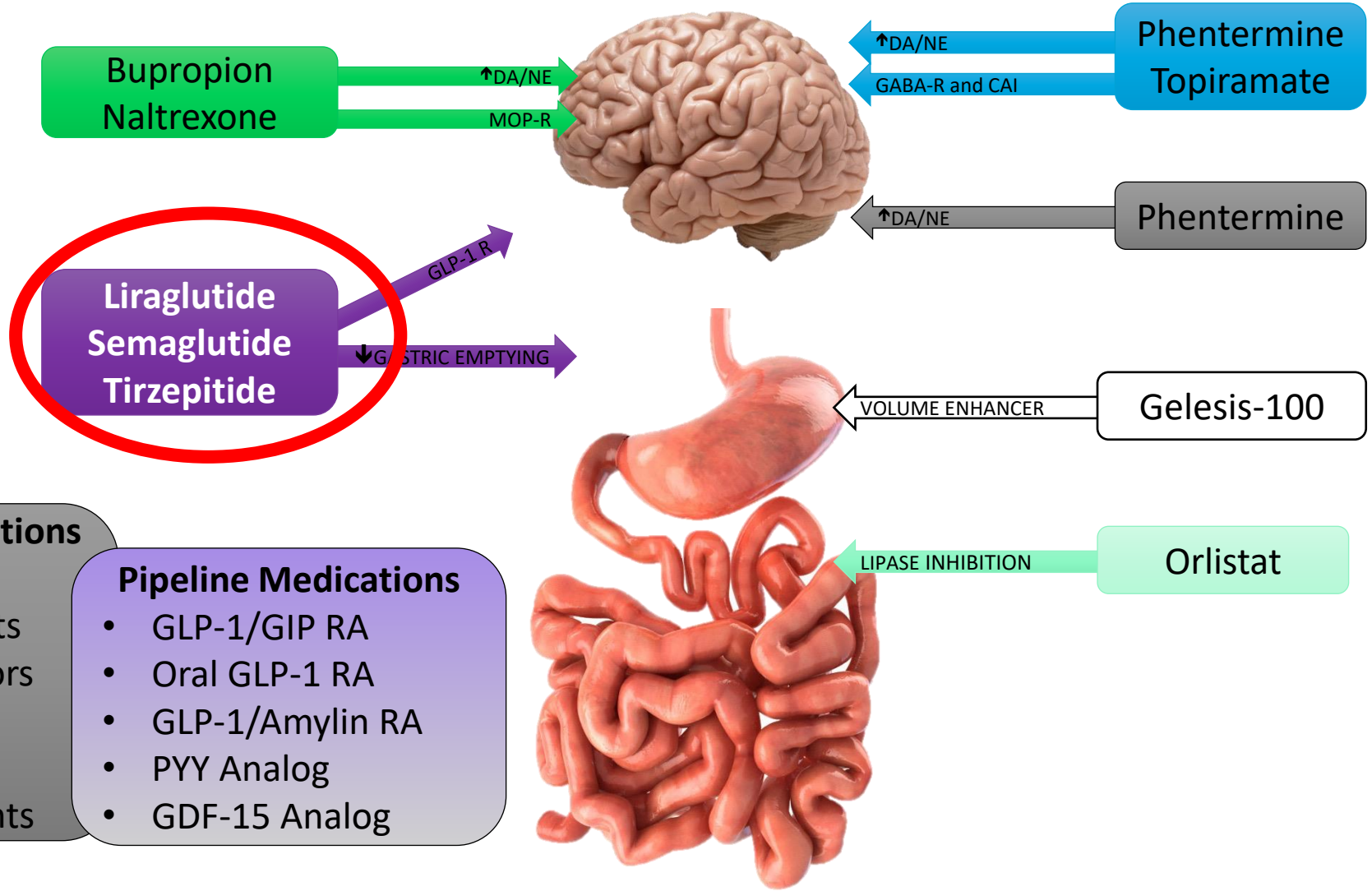
FDA Approved Anti-Obesity Medications



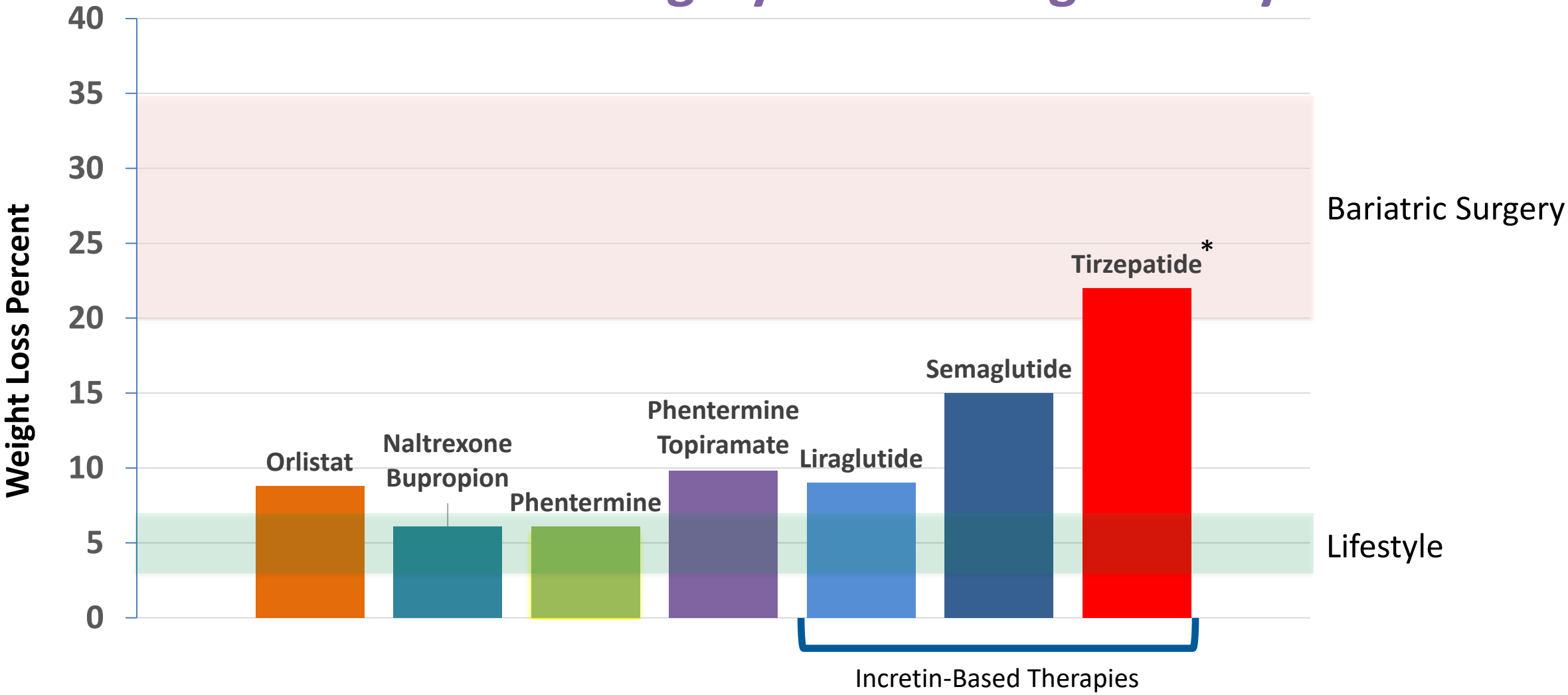
Off-Label Medications

- Metformin
- GLP-1R agonists
- SGLT-2 inhibitors
- Topiramate
- Bupropion
- Other stimulants

Pipeline Medications

- GLP-1/GIP RA
- Oral GLP-1 RA
- GLP-1/Amylin RA
- PYY Analog
- GDF-15 Analog

Effectiveness of Anti-obesity Medications vs. Lifestyle and Bariatric Surgery for Treating Obesity



Bariatric/Metabolic Surgery 2024

Sleeve Gastrectomy

69%

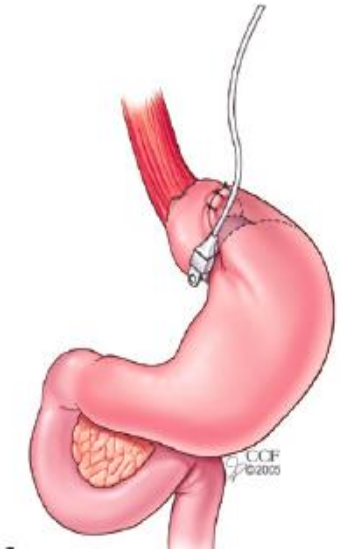
Gastric Bypass

27%

Duodenal Switch

SADI

3.0 %



Gastric Banding

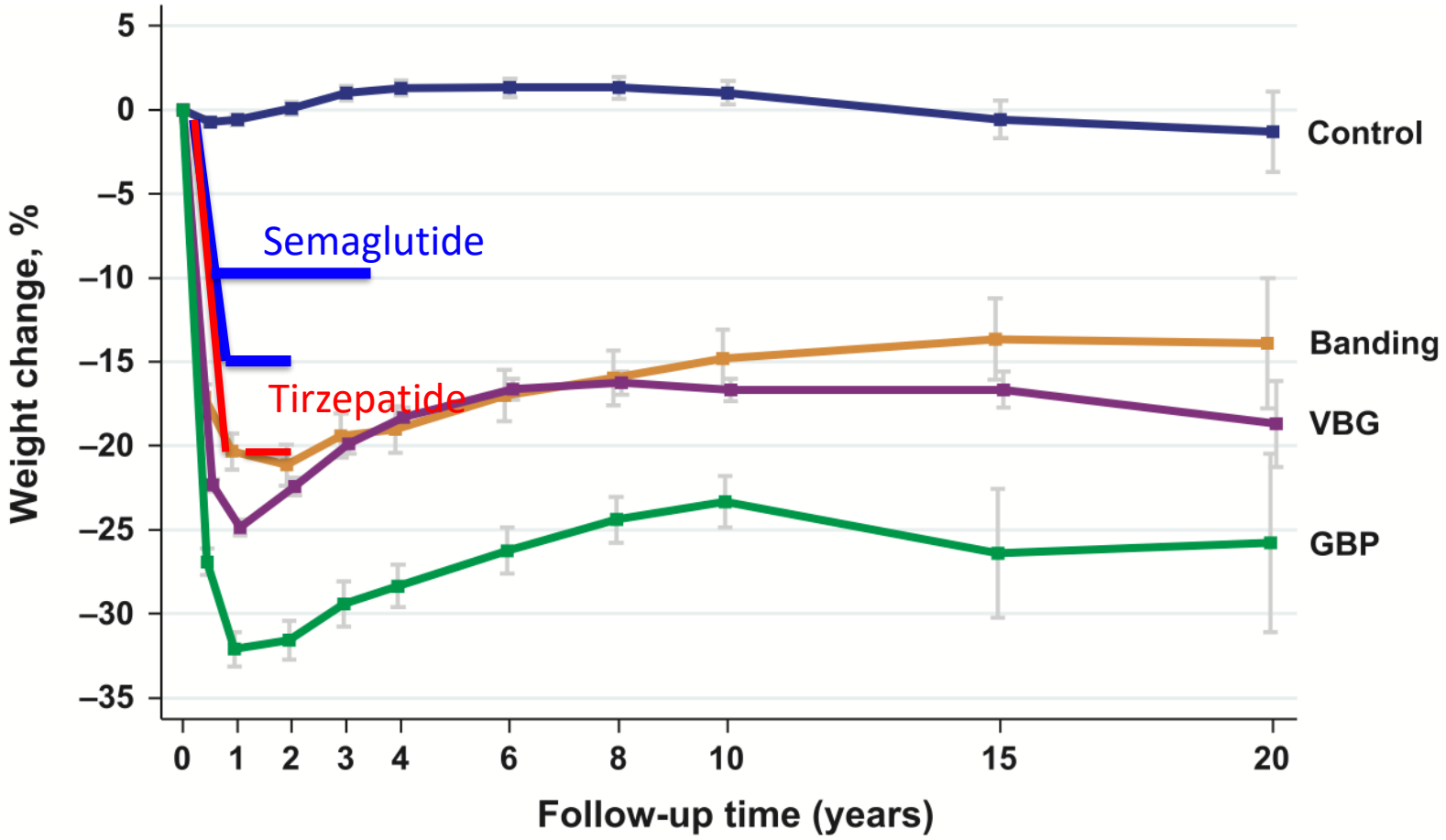
1.0%

pb

ASMBS 2022, ASMBS.ORG

Weight Loss After Metabolic Surgery Is Sustained for at Least 20 years-Superior to all other Treatments Swedish Obese Subjects Study

Slide per P Schauer MD



Improvement/Remission

- HTN
- Dyslipidemia
- T2D
- OSA
- NAFLD
- CVD
- Reduced Cancer
- Others

Maintained wt. loss hard to achieve!

JAMA. 2012;307(1):56-65

RYGB > 10 YEAR F/U

18 Studies
Av. BMI 47
BMI Range 35-60+

Table 1 Gastric bypass

Reference	Type	Initial #	FU %	Duration of FU	# pts at max. years	% EWL at max. years	% reoperation
Fobi, 1993 [14]	RYGB	100	NR	10	46	55	12
Wolfel, 1994 [15]	RYGB	143	71	10	83	49	NR
Pories, 1995 [16]	RYGB	608	97	14	10	49	38
Sugerman, 2003 [17]	RYGB	1025	37	10–12	135	52	NR
Gunther, 2006 [5]	RYGB	195	69	25	72	27	8
Christou, 2006 [18]	RYGB	274	84	12	161	68	NR
Sjostrum, 2007 [19]	RYGB	265	NR	15	10	66	17
Higa, 2011 [20]	RYGB	242	29	10	65	57	32
Angrisani, 2013 [13]	RYGB	24	84	10	21	69	29
Obeid, 2016 [21]	RYGB	328	46	10	134	59	64
Chen, 2016 [22]	RYGB	173	NR	11	78	67	NR
Maciejewski, 2016 [23]	RYGB	1787	82	10	564	56	NR
Monaco-Ferreira, 2017 [24]	RYGB	166	26	10	44	52	NR
Valezi, 2013 [25]	RYGB	211	55	10	116	65	NR
Mehaffey, 2016 [26]	RYGB	1087	61	10	651	52	NR
Kothari, 2017 [27]	RYGB	1402	70	10	191	56	NR
Carbajo, 2017 [28]	SAGB	1200	72	12	29	70	2
Sheikh, 2017 [29]	SAGB*	156	89	11	102	84	14

= 30% TWL

* indicates silastic ring used

Lifestyle:
6% TWL @10 years
Look AHEAD

AOM'S
NO 5 YR DATA

SLEEVE GASTRECTOMY > 10YEAR F/U

2 Studies

Reference	Procedure type	Initial #	Follow-up %	Duration of FU	# pts at max. years	%EWL at max. years	Reoperation %
Arman, 2016 [54]	Sleeve	110	59	11	47	62	32
Felslenreich, 2016 [55]	Sleeve	53	60	10	32	53	36

= 22% TWL

Superiority of Surgery Over Medical Treatment

- Magnitude of Weight loss
- Durability of Weight loss
- Effective in High BMI
- Reduction of medication dependency
- Co-morbidity Improvement
- Cardiovascular Benefit
- NASH Fibrosis Reduction
- Cancer Reduction
- Cost-effectiveness

How Can GLP1's Improve Surgery Outcomes?

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Safety

Five-Year Analysis of the MBSAQIP Database: Are We Getting Better?

Evaluation of 690,770 Roux-en-Y Gastric Bypass and Sleeve Gastrectomy using MBSAQIP Database
Outcomes of cases from 2015 to 2019

Decrease in all-cause mortality

0.11% → 0.08%

(percent of patients)

Decrease in 30-day readmission

4.22% → 3.43%

(percent of patients)

Decrease in end-organ dysfunction

0.21% → 0.13%

(percent of patients)

Decrease in bleeding units

0.73% → 0.64%

(percent of patients)

Decrease in postoperative surgical site infection (SSI)

0.23% → 0.22%

(percent of patients)

Decrease in postoperative pneumonia

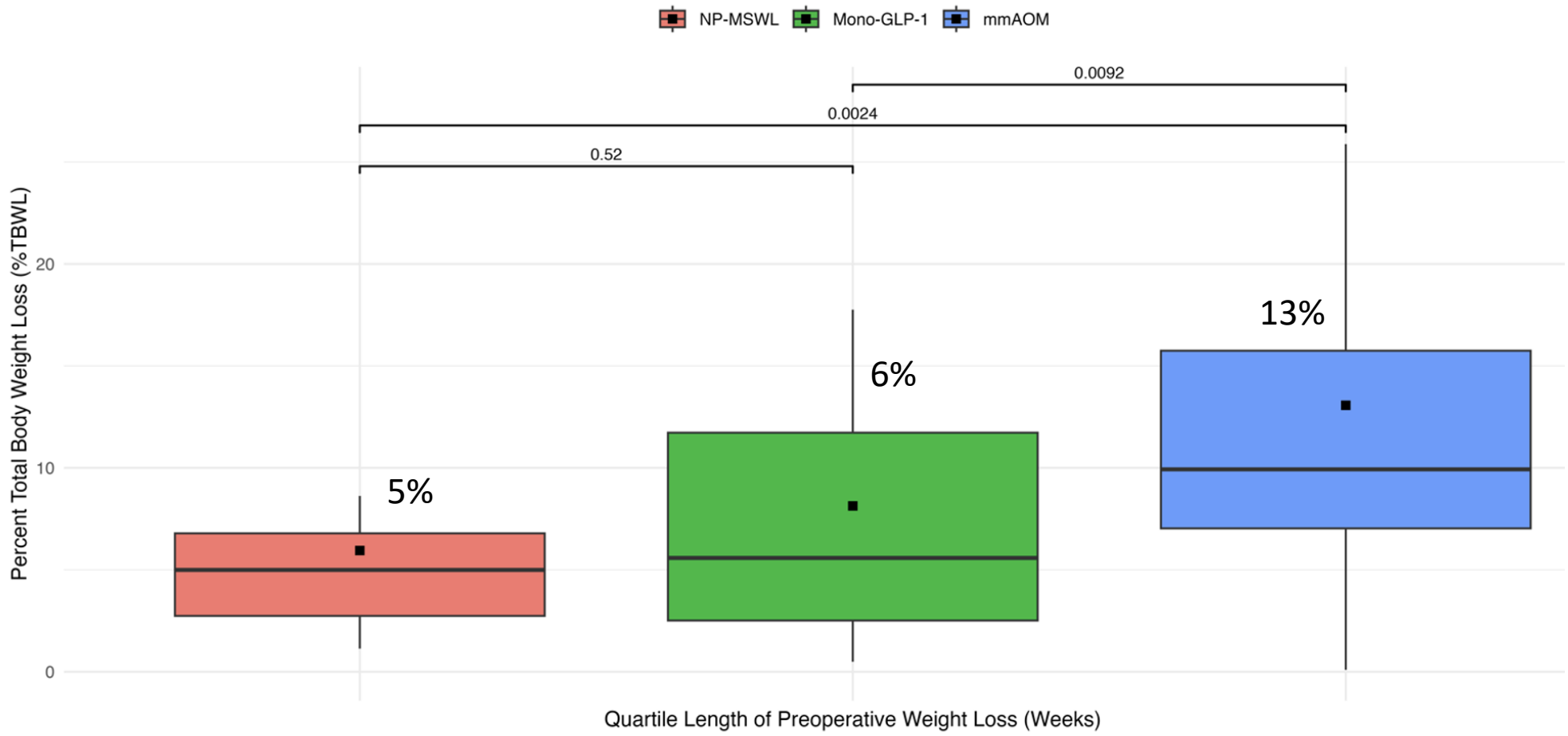
0.22% → 0.19%

(percent of patients)

Clapp et al. J Am Coll Surg, June 2022

JACS

Preop Wt. Loss for BMI >70



Kachmar M……Schauer P ASMBS 2024

Efficacy

Power of Combining The Two Most Effective Treatments of Metabolic Disease

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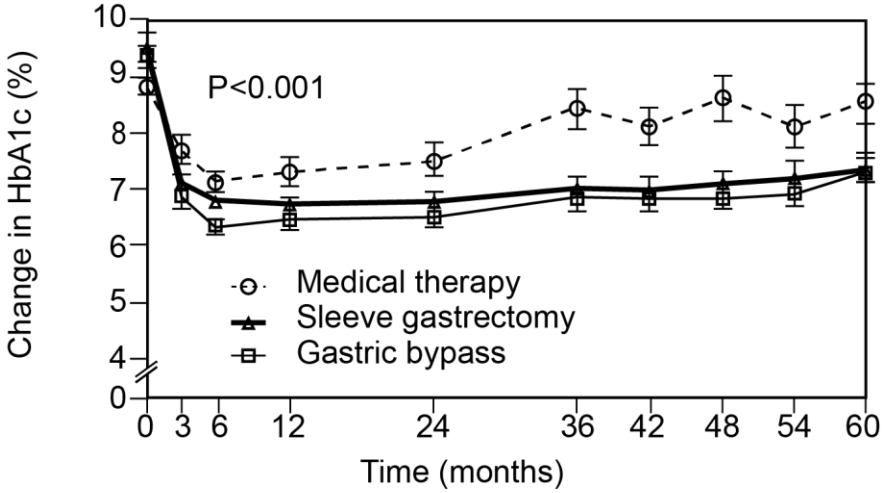
Surgery + Meds Superior to Medical Rx of T2D: 12 RCT's up to 10 YR F/U

STUDY	Pts w/BMI <35 kg/m²	Study design	No. pts	Follow-up (months)	Remission criteria	Remission or change in HbA1c (%)[a]	P value
Dixon	22%	LAGB vs control	60	24	HbA1c < 6.2%	73 vs 13	< 0.001
Schauer	36%	RYGB vs SG vs control	150	60	HbA1c ≤ 6.0%	22 vs 15 vs 0	< 0.05
Mingrone	0%	RYGB vs BPD vs control	60	60	HbA1c ≤ 6.5%	42 vs 68 vs 0	0.003
Ikramuddin	59%	RYGB vs control	120	60	HbA1c < 6.0%	7 vs 0	0.02
Liang	100%	RYGB vs control	101	12	HbA1c < 6.5%	90 vs 0 vs 0	< 0.0001
Halperin	34%	RYGB vs control	38	12	HbA1c < 6.5%	58 vs 16	0.03
Courcoulus	43%	RYGB vs LAGB vs control	69	36	HbA1c < 6.5%	40 vs 29 vs 0	0.004
Wentworth	100%	LAGB vs control	51	24	FBG < 7.0 mmol/L	52 vs 8	0.001
Parikh	100%	(RYGB/LAGB/SG) vs control	57	6	HbA1c < 6.5%	65 vs 0	0.0001
Ding	34%	LAGB vs control	45	12	HbA1c < 6.5%	33 vs 23	0.46
Cummings	25%	RYGB vs control	43	12	HbA1c < 6.0%	60 vs 5.9	0.002
Shah	85%	RYGB vs control	80	24	HbA1c < 6.5%	60 vs 2.5	<0.001

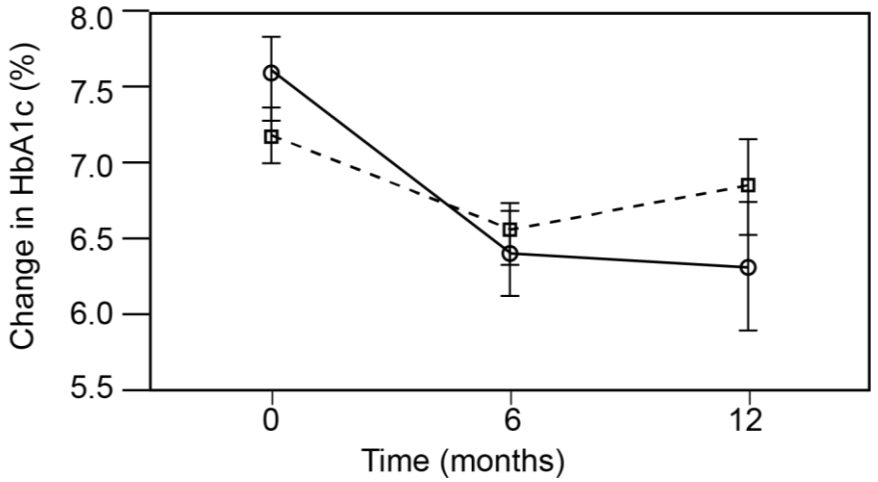
Annu. Rev. Med. 2020. 71:1-15

Alliance of Randomized Trials of Medication vs. Metabolic Surgery - ARMMS

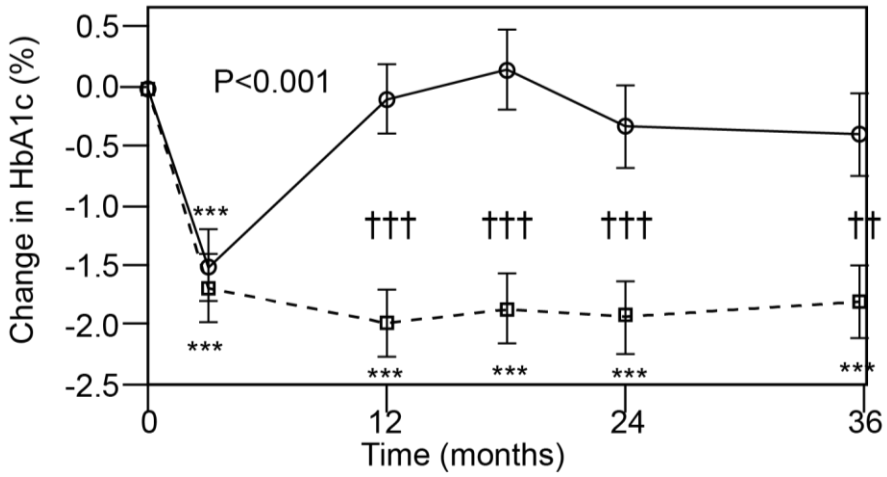
STAMPEDE Trial



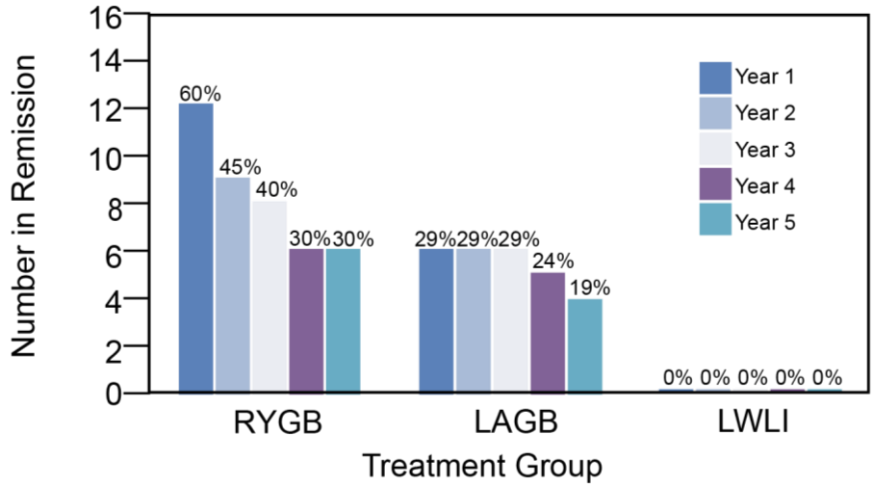
CROSSROADS Trial



SLIMM-T2D Trial



TRIABETES Trial



Research

JAMA | Original Investigation

Long-Term Outcomes of Medical Management vs Bariatric Surgery in Type 2 Diabetes

Feb 2024

Anita P. Courcoulas, MD; Mary Elizabeth Patti, MD; Bo Hu, PhD; David E. Arterburn, MD; Donald C. Simonson, MD, ScD; William F. Gourash, PhD; John M. Jakicic, PhD; Ashley H. Vernon, MD; Gerald J. Beck, PhD; Philip R. Schauer, MD; Sangeeta R. Kashyap, MD; Ali Aminian, MD; David E. Cummings, MD; John P. Kirwan, PhD

IMPORTANCE Randomized clinical trials of bariatric surgery have been limited in size, type of surgical procedure, and follow-up duration.

OBJECTIVE To determine long-term glycemic control and safety of bariatric surgery compared with medical/lifestyle management of type 2 diabetes.

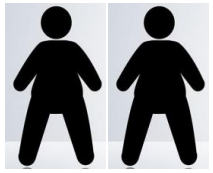
Editorial page 643

Multimedia

Supplemental content

JAMA. 2024;331(8):654-664. doi:10.1001/jama.2024.0318

Trial Design



N=355 participants with T2D randomized

Intensive Medical & Weight Management

- **Individualized Nutrition Counseling**
- **Exercise Counseling**
- **Behavioral Education**
- **Medication Adjustment**
- **Intensive Intervention: At Least 1 Year**
- **Continued Care with Currently-Available Medications & Lifestyle Support**

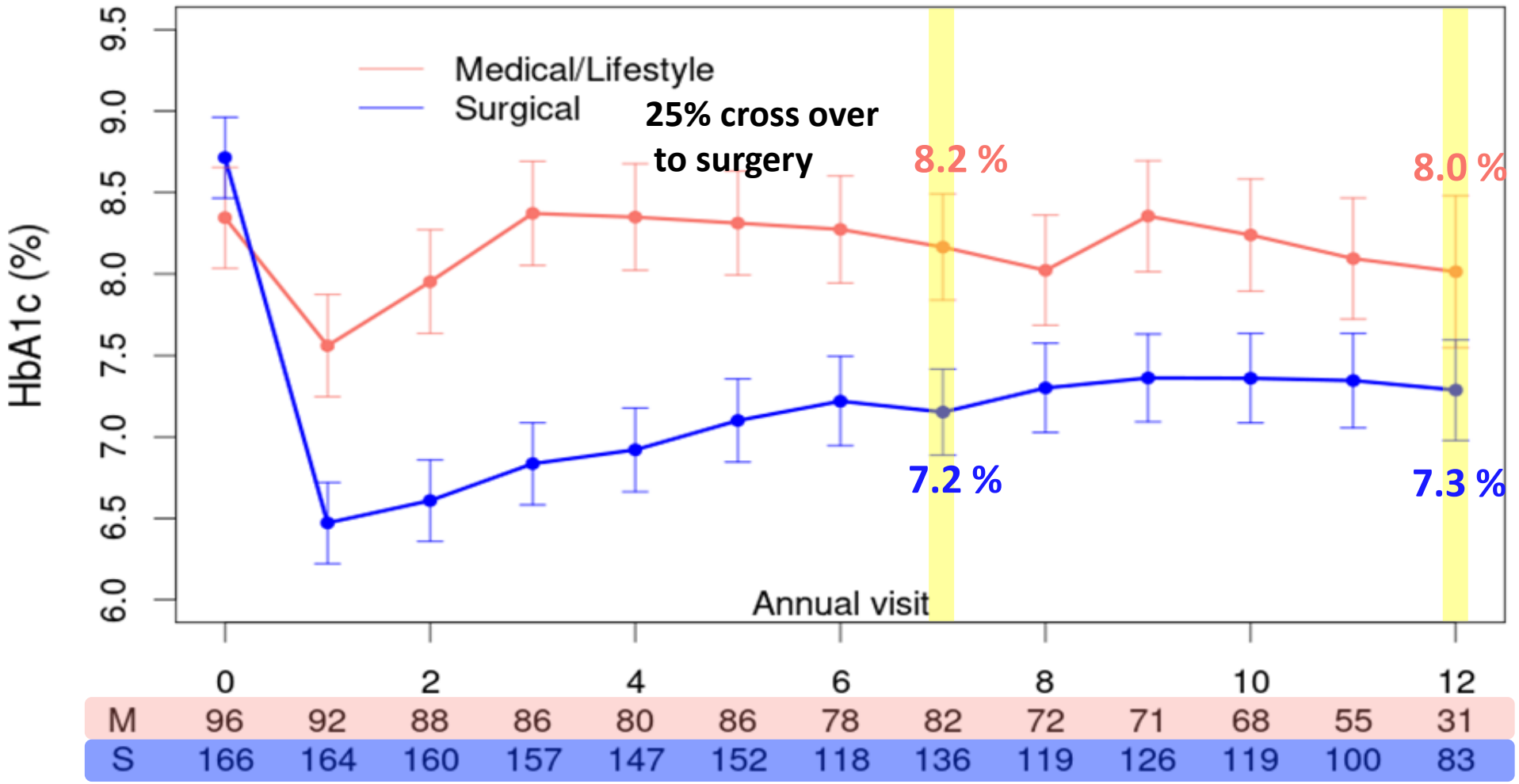
Metabolic Bariatric Surgery

Gastric Bypass (RYGB)

Sleeve Gastrectomy

Adjustable Gastric Band

Improved HbA_{1c} over time with surgery



40% on GLP1

Banding
Sleeve Gastrectomy
RYGB

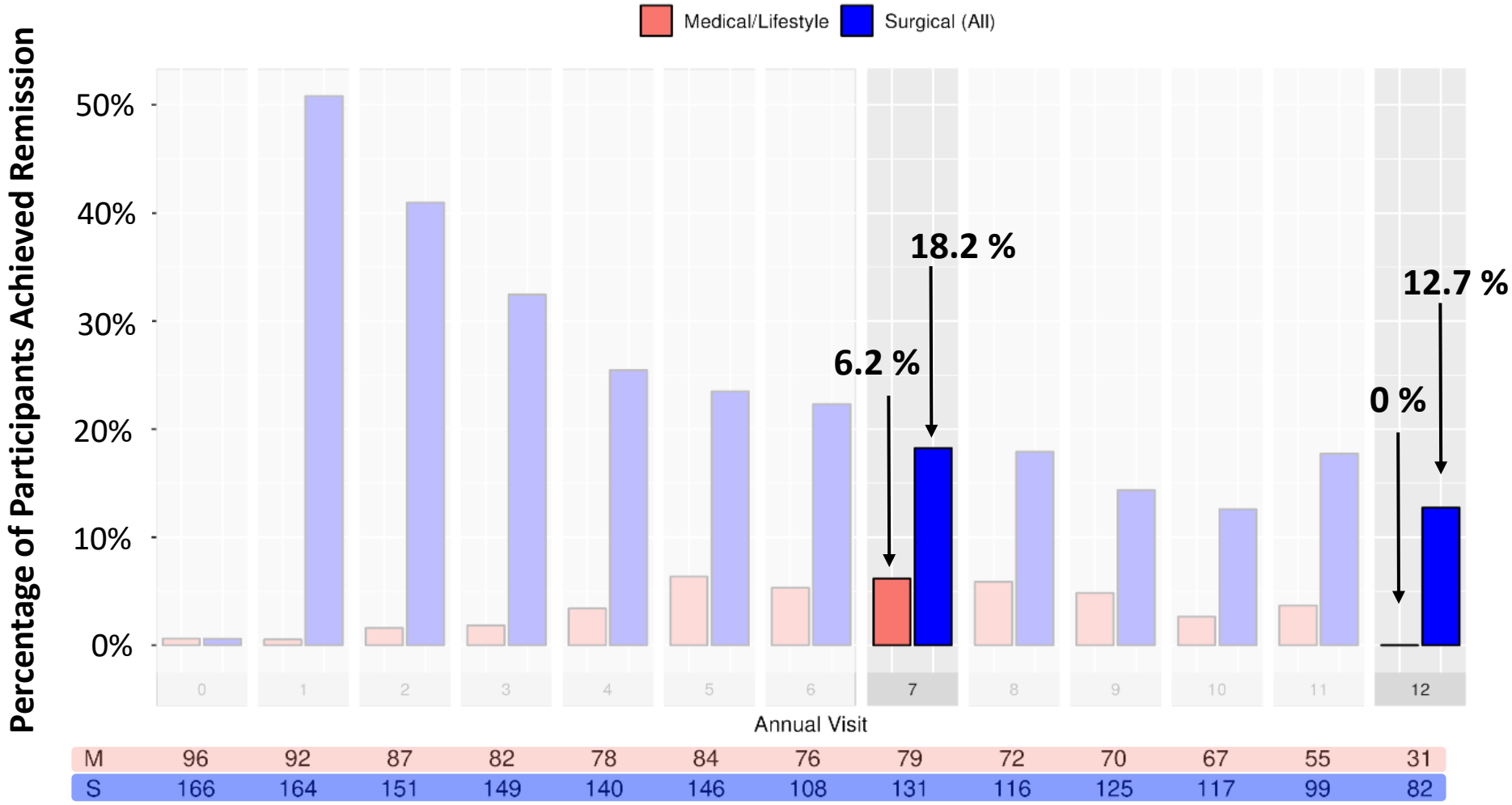
15% on GLP1

Intention to Treat (ITT) Analysis

p<.001 for the overall comparison, 7-year, 12-year

JAMA. 2024;331(8):654-664.

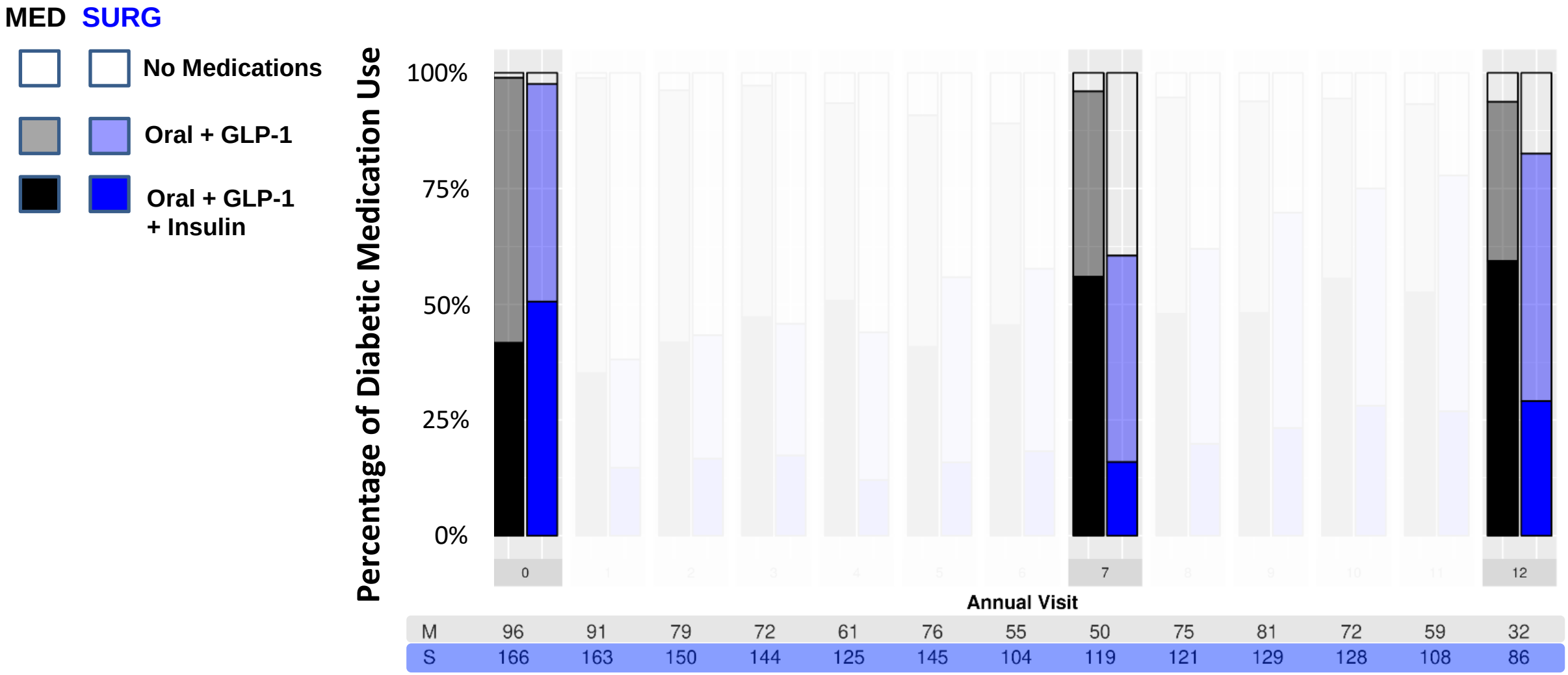
Remission (defined as HbA_{1c} < 6.5% without medications)



p<.001 for the overall comparison, p=0.02 for 7-year, *p*<.001 for 12-year

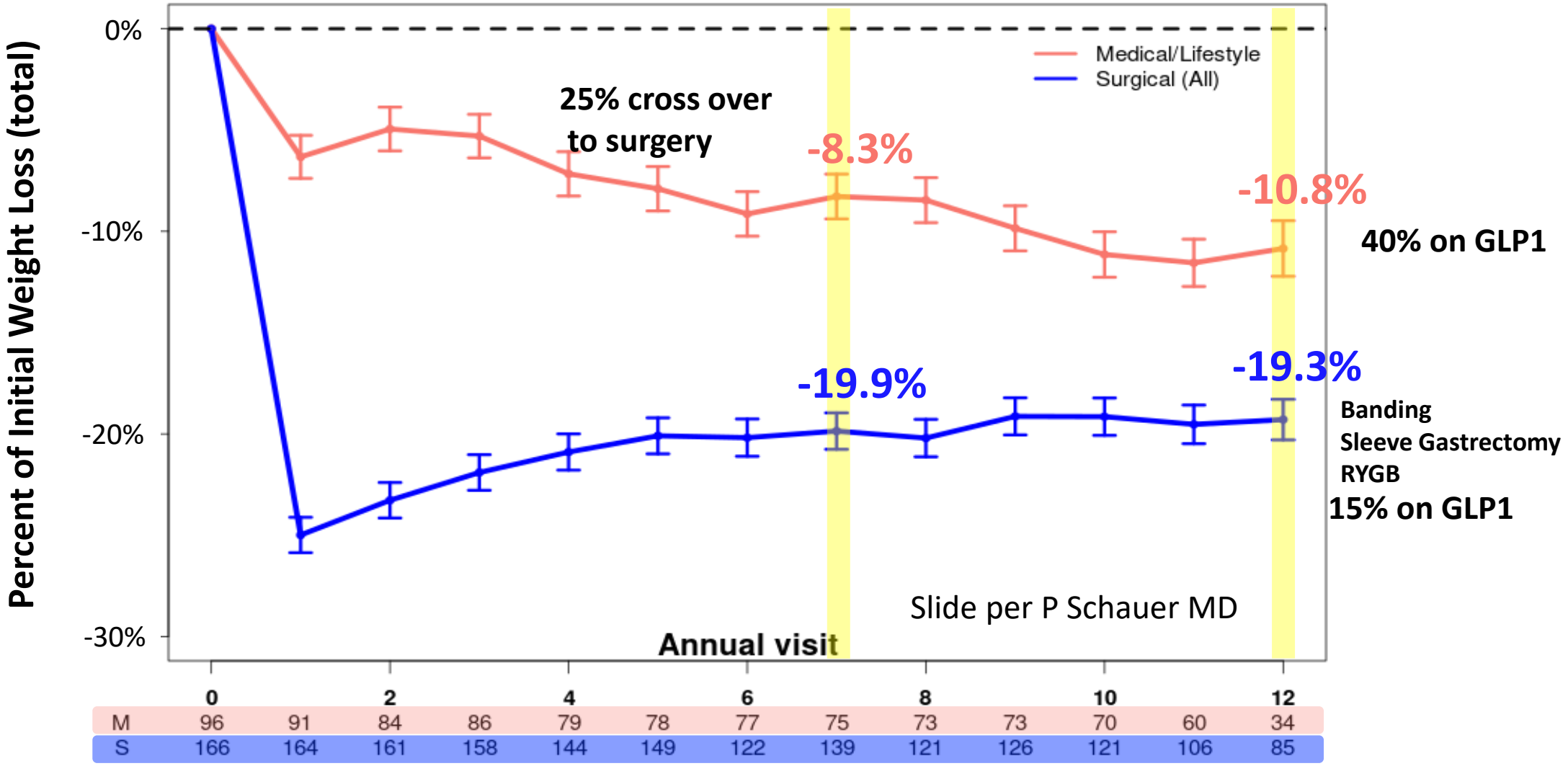
JAMA. 2024;331(8):654-664.

Diabetes Medication Use is Reduced in the Surgical Group



JAMA. 2024;331(8):654-664.

Greater Long-term Weight Loss with Surgery



Intention to Treat (ITT) Analysis

p<.001 for the overall comparison, 7-year, 12-year

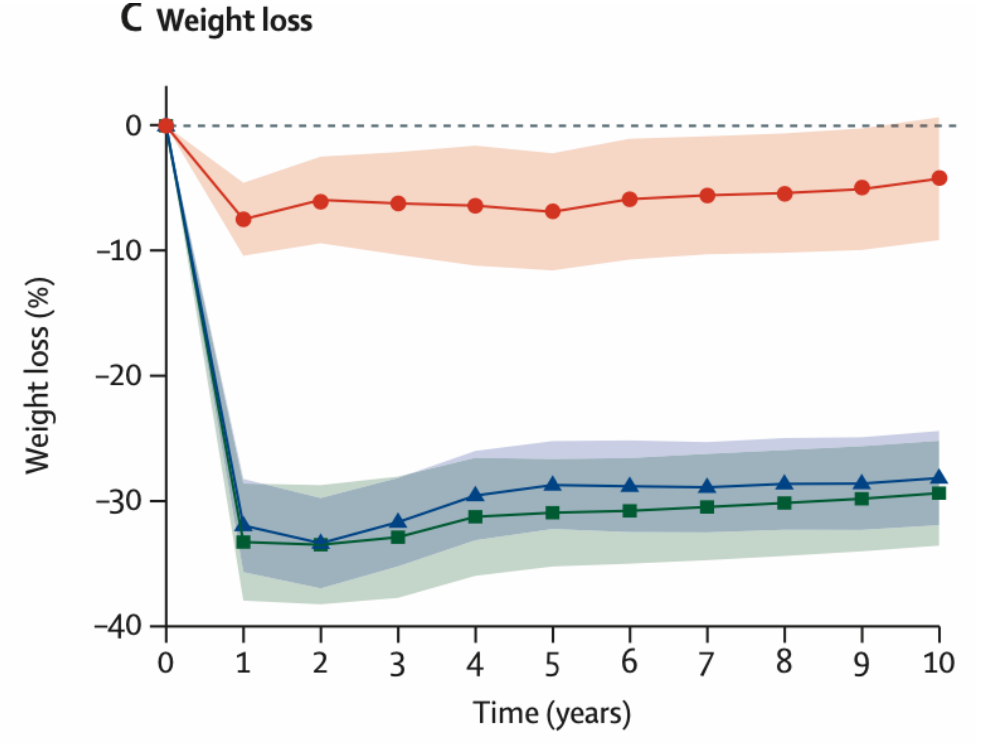
JAMA. 2024;331(8):654-664.

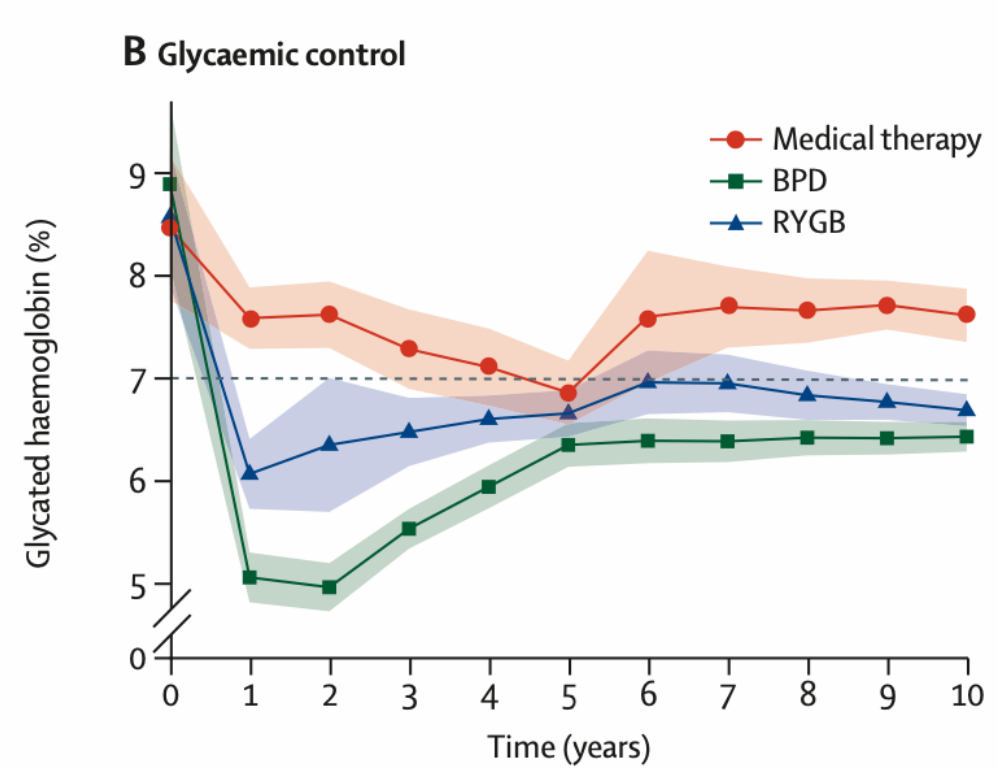
Metabolic surgery versus conventional medical therapy in patients with type 2 diabetes: 10-year follow-up of an open-label, single-centre, randomised controlled trial

N=60

www.thelancet.com Vol 397 January 23, 2021

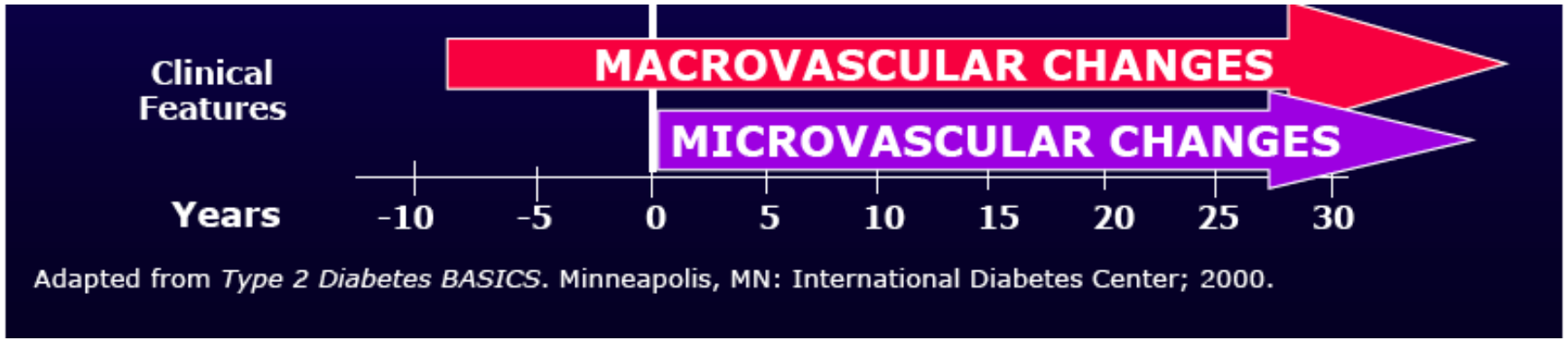
Geltrude Mingrone, Simona Panunzi, Andrea De Gaetano, Caterina Guidone, Amerigo Iaconelli, Esmeralda Capristo, Ghassan Chamseddine, Stefan R Bornstein, Francesco Rubino





Decrease in Diabetes Medications with Surgery

What about the effect of surgery on Long-term Morbidity/ Mortality



Metabolic Surgery Meta-analysis 2022
A.fib. HF. MI. CVA

N=39
Studies
Primary Prevention

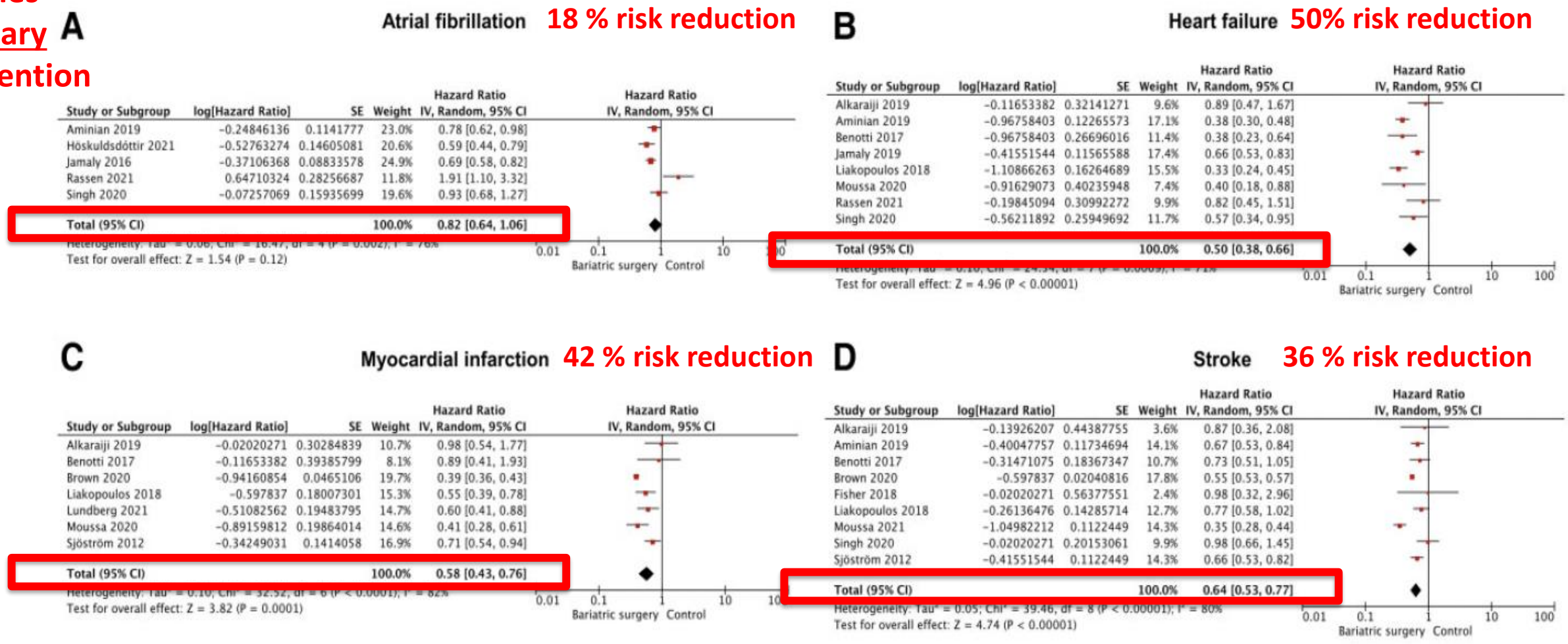


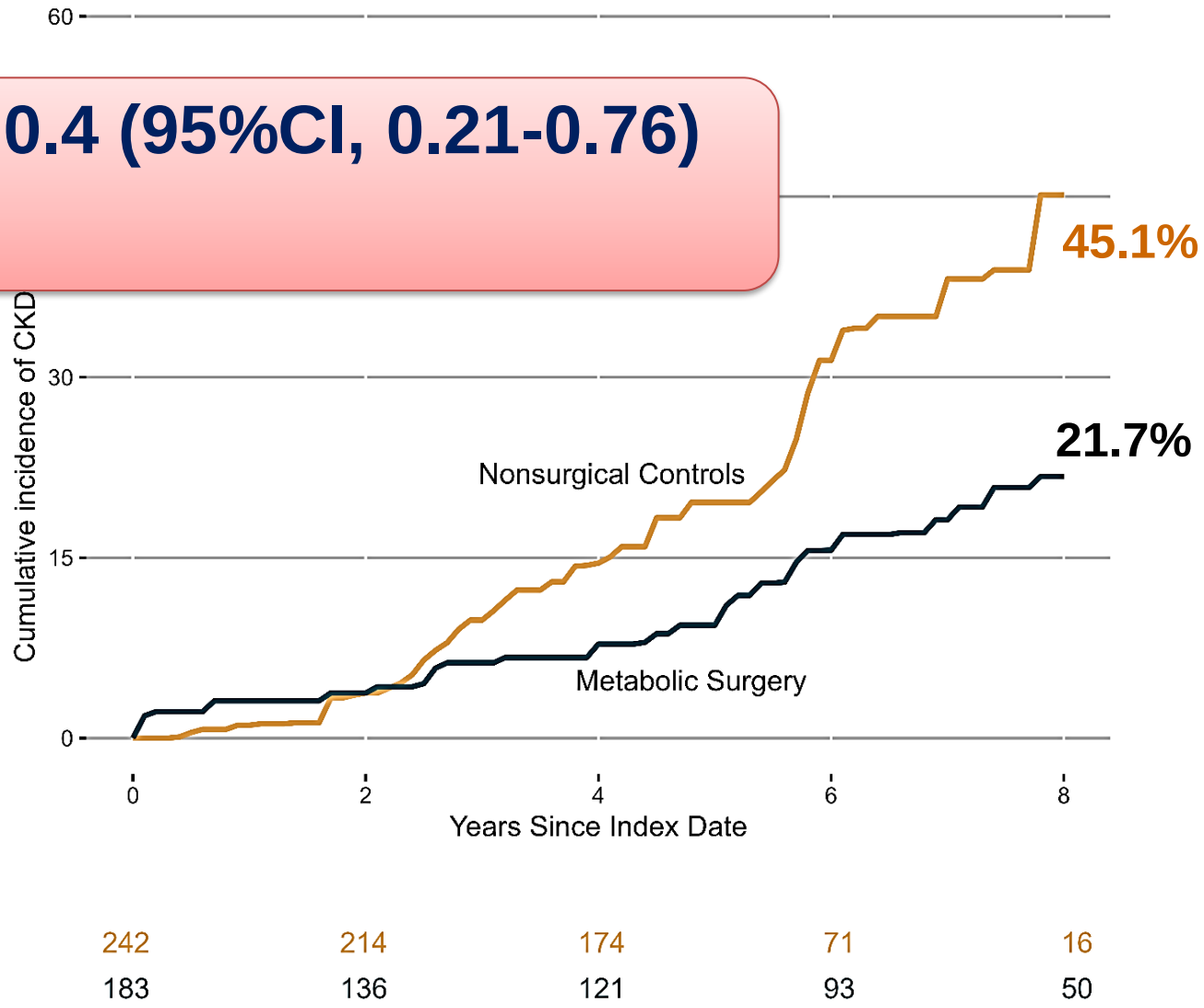
Figure 3 Forest plot of pooled hazard ratios of atrial fibrillation, heart failure, myocardial infarction, and stroke. CI, confidence interval; standard error.

European Heart Journal (2022) **43**, 1955–1969

Primary End Point: CKD Progression

Adjusted HR 0.4 (95%CI, 0.21-0.76)

P value .006

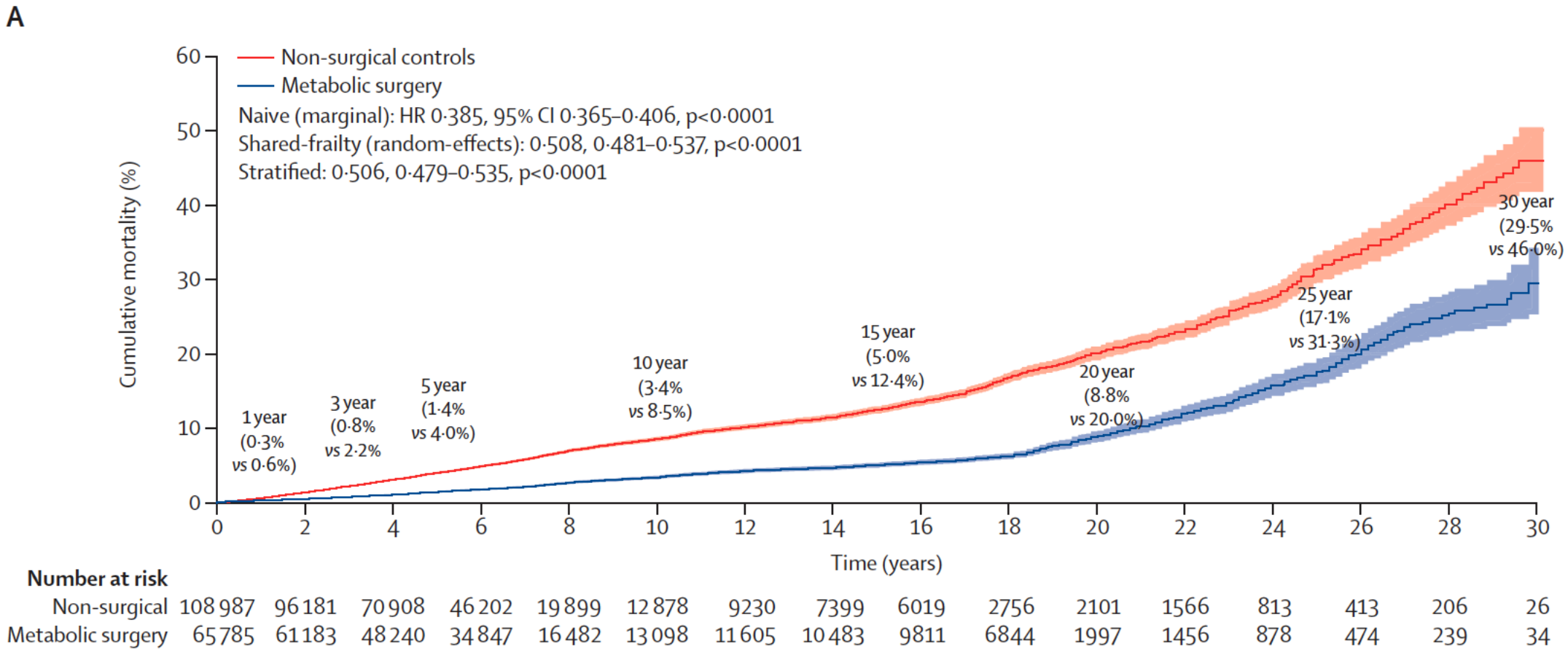


N=242
80% on GLP1-RA

N=183
10% on GLP1-RA

Aminian et al. Annals of Surgery 2024

49% Mortality Risk Reduction with Bariatric Surgery (n=174,772)



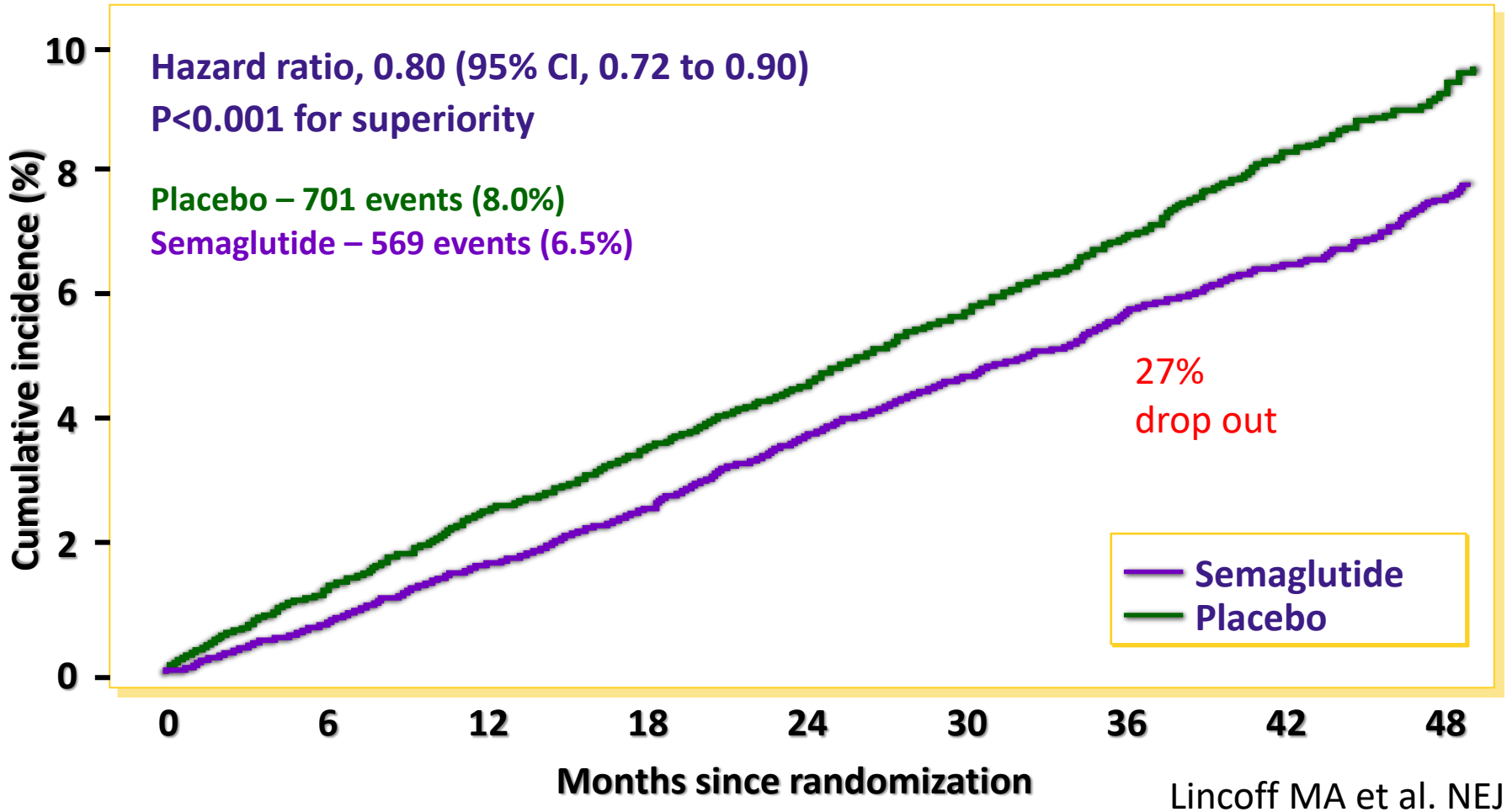
Syn NL et al. Lancet, May 2021

SELECT Trial – Cardiovascular Efficacy

Secondary Prevention

CV Death, Nonfatal MI, or Nonfatal Stroke

Primary Cardiovascular Composite Endpoint



Semaglutide
20% Risk Reduction
NNT = 67

Metabolic Surgery
>50% Risk Reduction
NNT = 13

Lincoff MA et al. NEJM November 2023

Medical Treatment Alone vs. Metabolic Surgery + Meds

Score Card per Philip Schauer MD

	Medical Alone	Metabolic Surgery + Medications	Winner
Short-term Wt. Loss	15%	30-35%	Metabolic Surgery + Meds
Long-term Wt. Loss	9% (4 yr)	25-30% (20+ yrs)	Metabolic Surgery + Meds
Effective in High BMI	Modest	Major	Metabolic Surgery + Meds
Short term Serious Adverse Events	<1%	3%	AOM's alone
Health-Related Quality of Life	Modest	Major	Metabolic Surgery + Meds
Steatohepatitis	Modest	Major	Metabolic Surgery + Meds
Cancer Reduction	?	17%	Metabolic Surgery + Meds
Long-term CV Benefit (MACE)	20% reduction	> 50% reduction	Metabolic Surgery + Meds
Long-term Mortality Benefit	19% reduction	45% reduction	Metabolic Surgery + Meds
Cost (including GLP1–RA's)	$10,000/yr	$1,500/yr +?	Metabolic Surgery + Meds

WELCOME TO THE ERA OF GLP1-RA'S

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