
ERAS For Patients Undergoing Gastropasty

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■ Conflicts of Interest

No Conflicts of Interest

■ Outline

- Obesity & Why It Matters
- Introduction to Endobariatric Therapies
- Endoscopic Bariatric Therapies
 - Endoscopic Sleeve Gastroplasty
 - Revisional Endoscopic Sleeve Gastroplasty
 - Transoral Gastric Outlet Reduction (TORe)

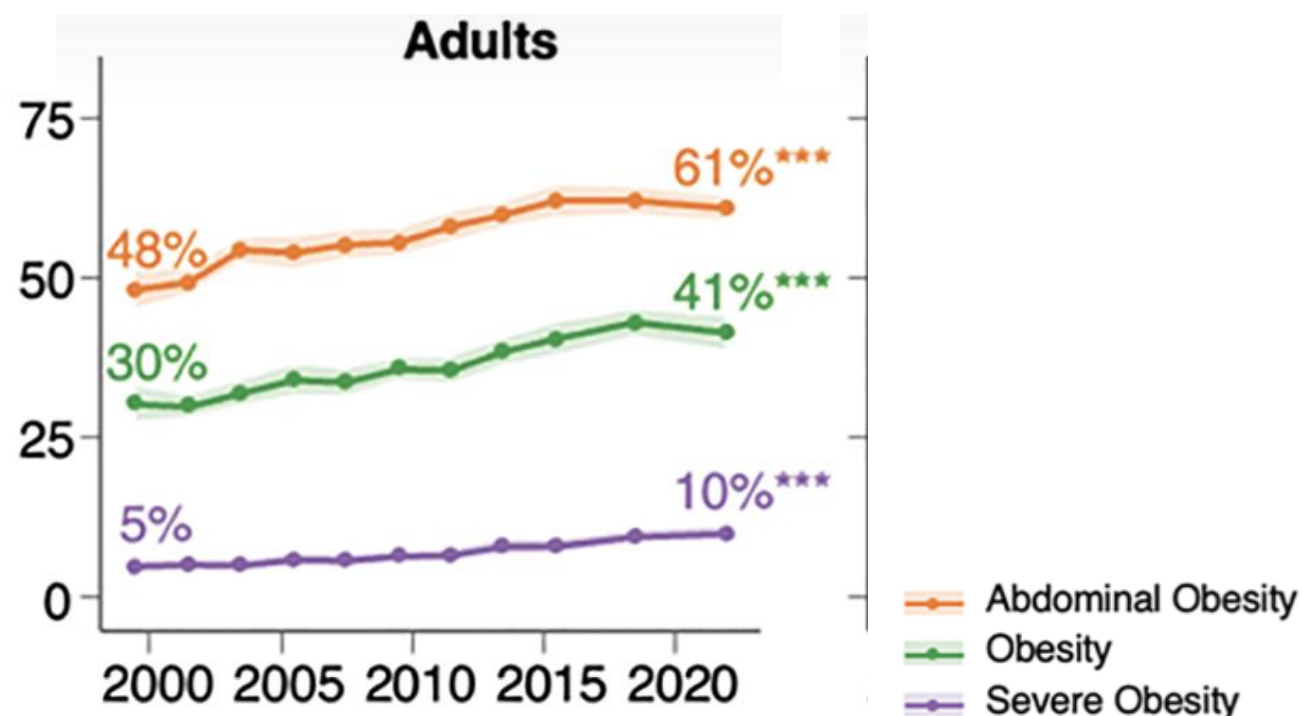
Obesity, Severe Obesity, and Abdominal Obesity in US Youth and Adults From 1999 to 2023

Circulation

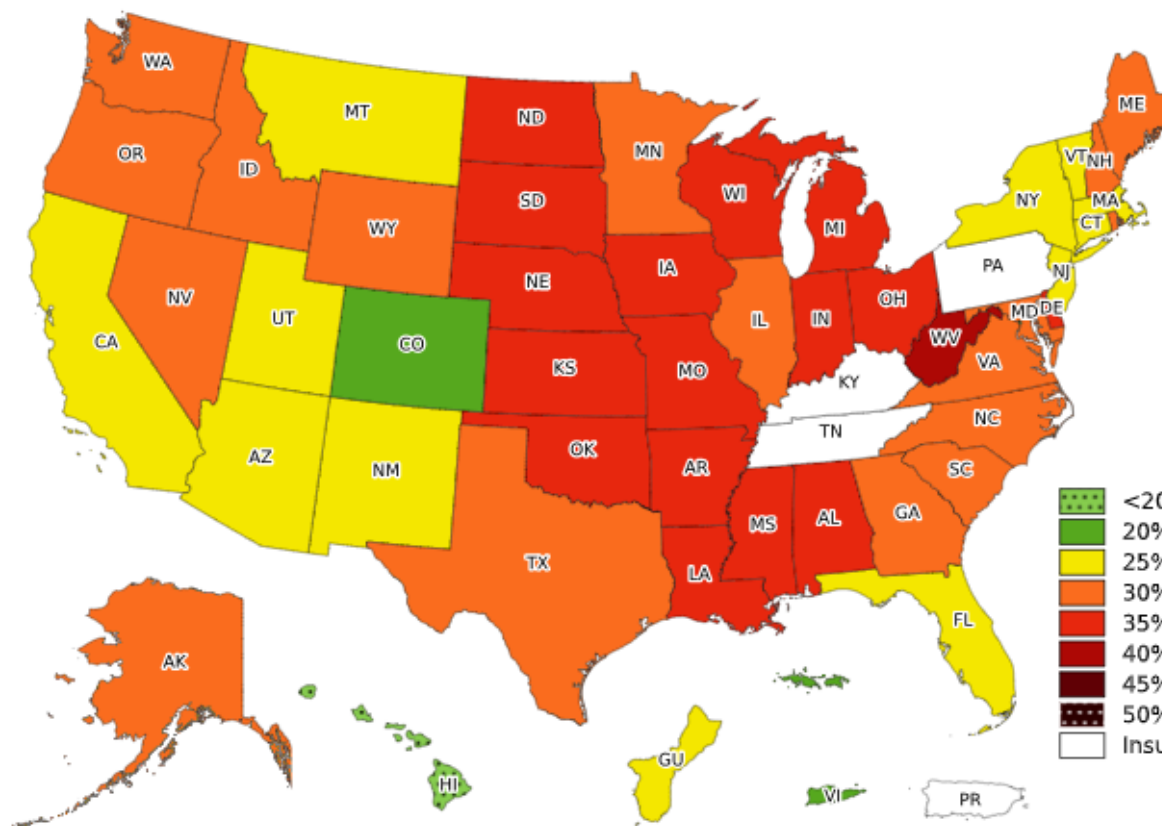
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<https://doi.org/10.1161/CIRCULATIONAHA.126.080146>

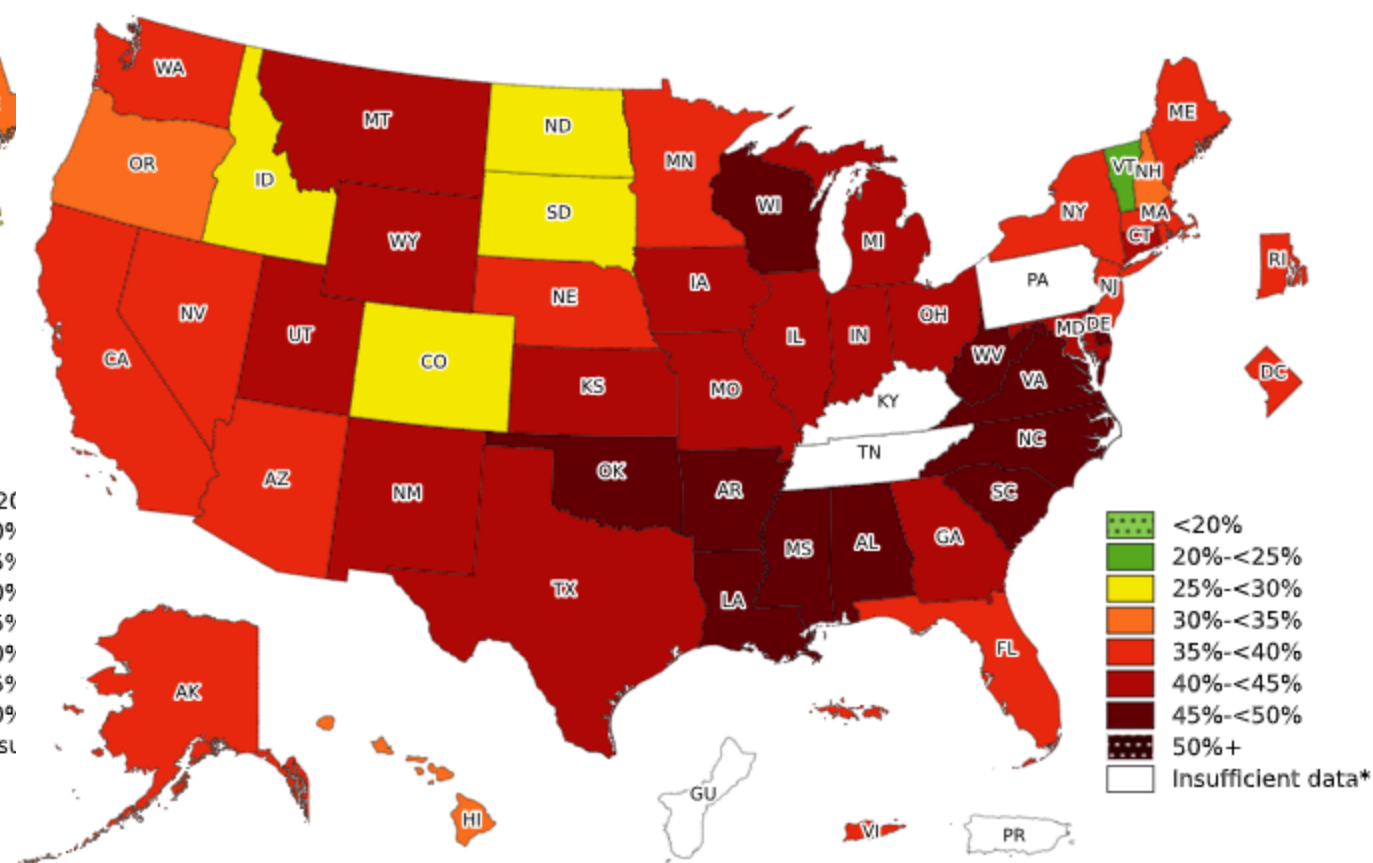
Anum S. Minhas, MD, MHS , Amelia S. Wallace, PhD, MS , Sui Zhang, MS , Robert B. Barrett, BS , and Chiadi E. Ndumele, MD, PhD 



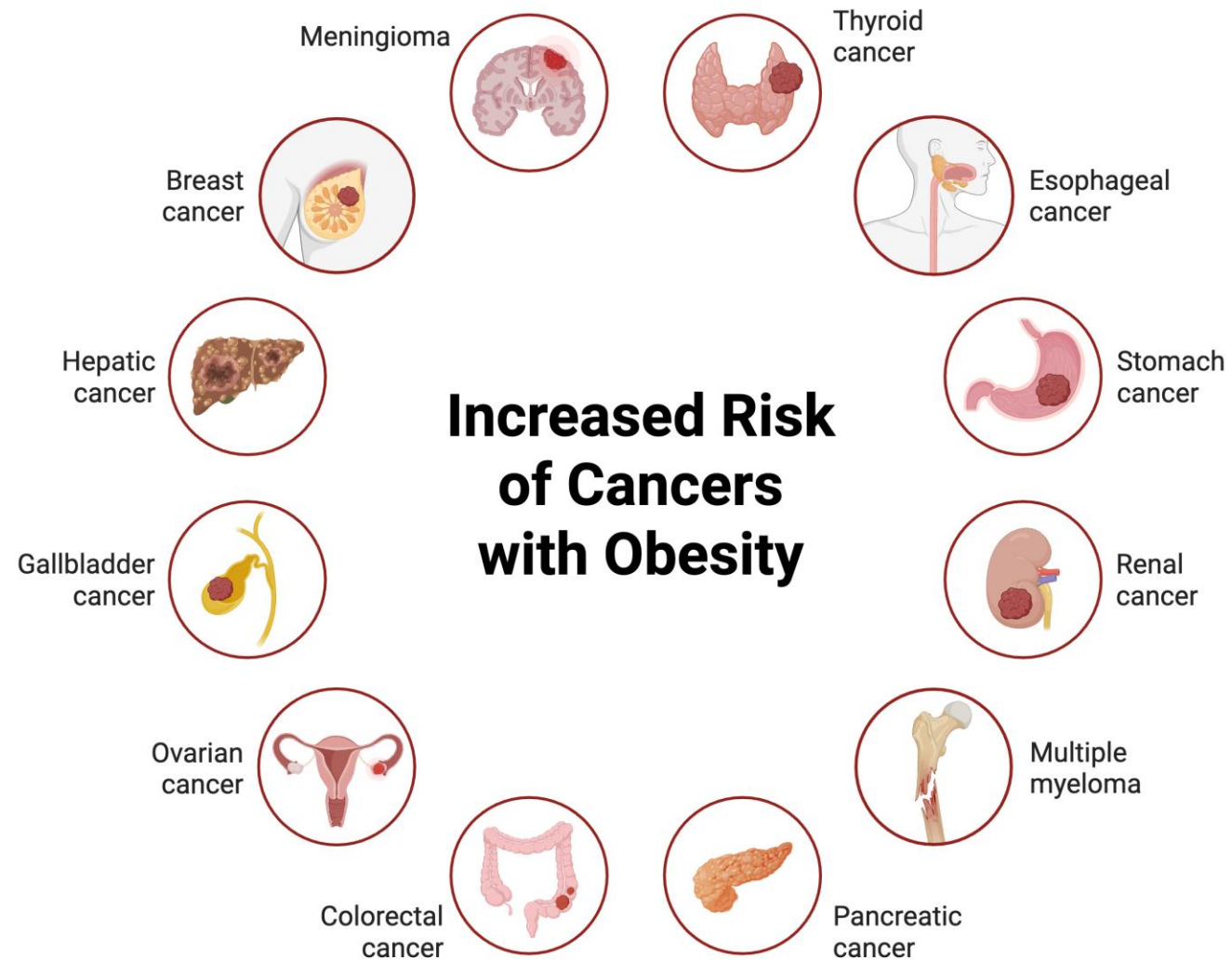
Prevalence of Obesity in the US, 2022-2024



Prevalence of Obesity, Non-Hispanic White Adults



Prevalence of Obesity, Non-Hispanic Black Adults



White Paper AGA: POWER — Practice Guide on Obesity and Weight Management, Education, and Resources

Andres Acosta,* Sarah Streett,† Mathew D. Kroh,§ Lawrence J. Cheskin,|| Katherine H. Saunders,¶ Marina Kurian,# Marsha Schofield,** Sarah E. Barlow,†† and Louis Aronne¶

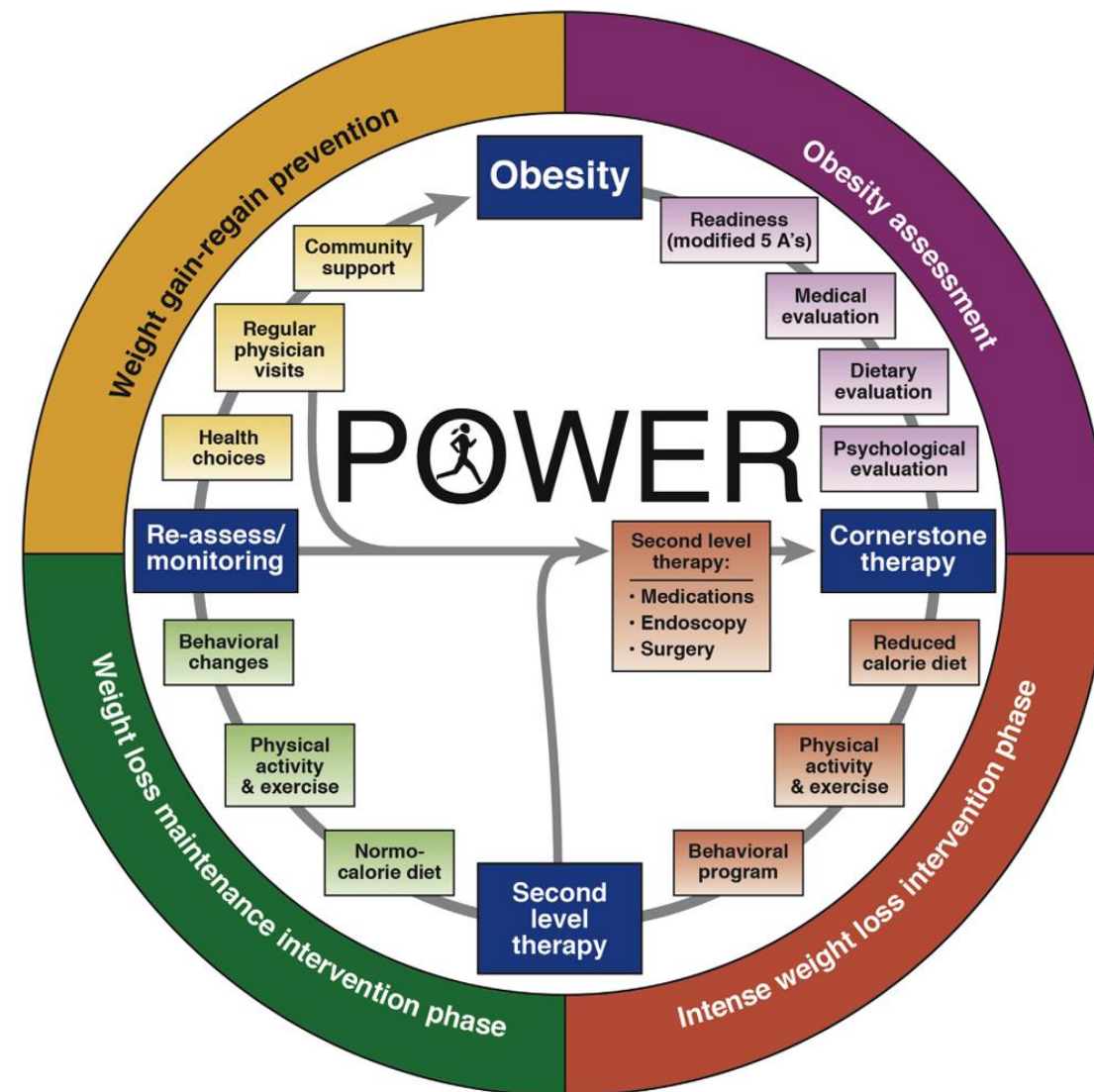


Cornerstone Therapy

- Lifestyle Modifications with Diet and Exercise
- Best delivered by a multidisciplinary team

Second Level Therapy

- Pharmacotherapy
- Surgery
- Endoscopy



■ Endoscopic Bariatric Therapies

Gastric

————→ Gastric Remodeling
Outlet Reduction
Procedureless
Space Occupying
Outlet Obstruction
Aspiration

Small Bowel

Sleeves
Duodenal Resurfacing
Flow altering

Gastric Remodeling: Endoscopic Sleeve Gastroplasty

- **What is it:**
 - Endoscopically suturing anterior and posterior aspects of the stomach together using the OverStich Device.
 - Created a tubular 'sleeve' appearing stomach to help restrict food intake
 - Outpatient procedure
- **Who Qualifies?**
 - Patients 18 years and older
 - BMI at least 30 kg/m²
 - Prior attempts at weight loss were unsuccessful
 - Do not qualify for surgery or do not want surgery
 - Bridge to surgery for patients who do not qualify due to BMI and/or comorbidities

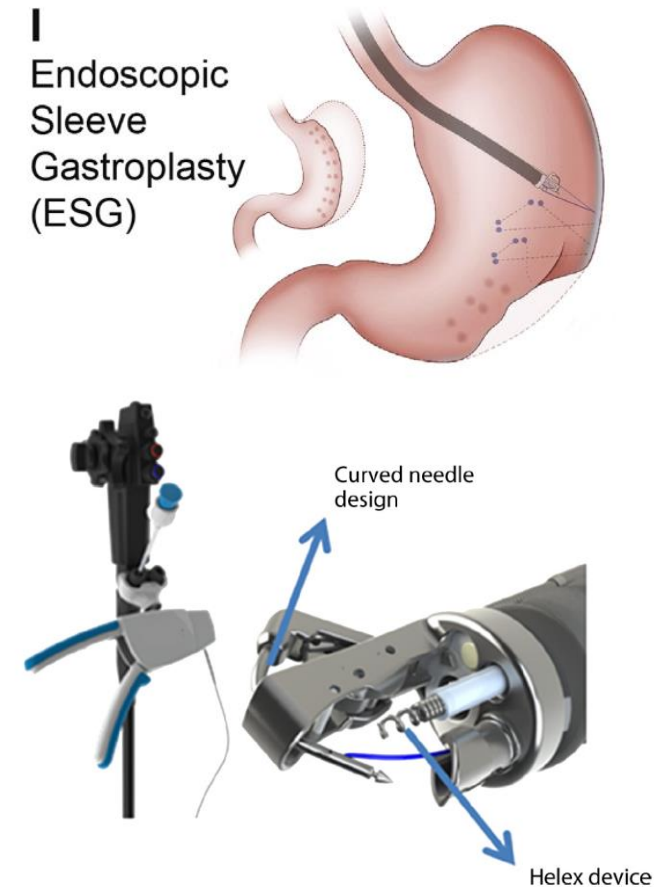
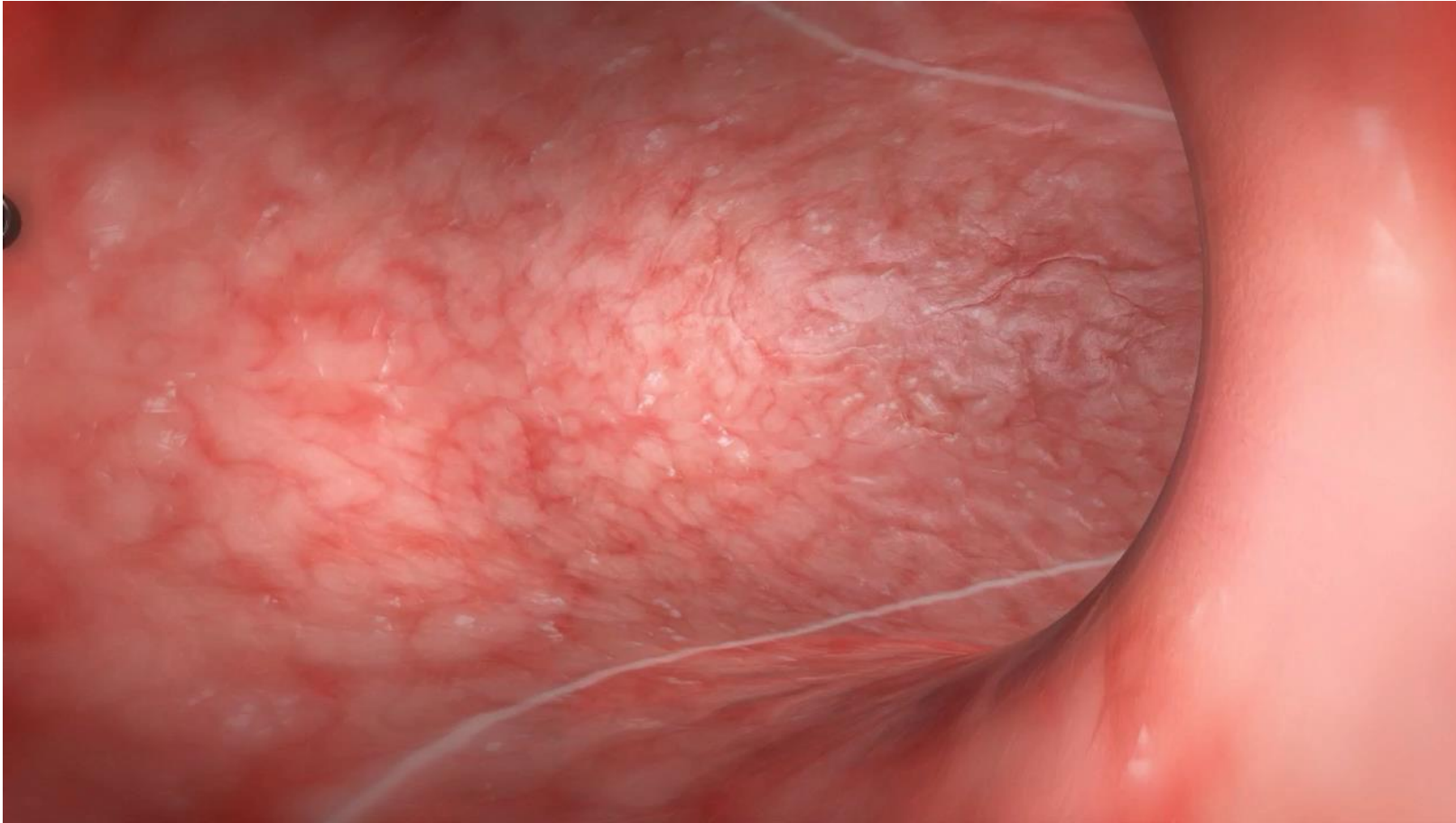
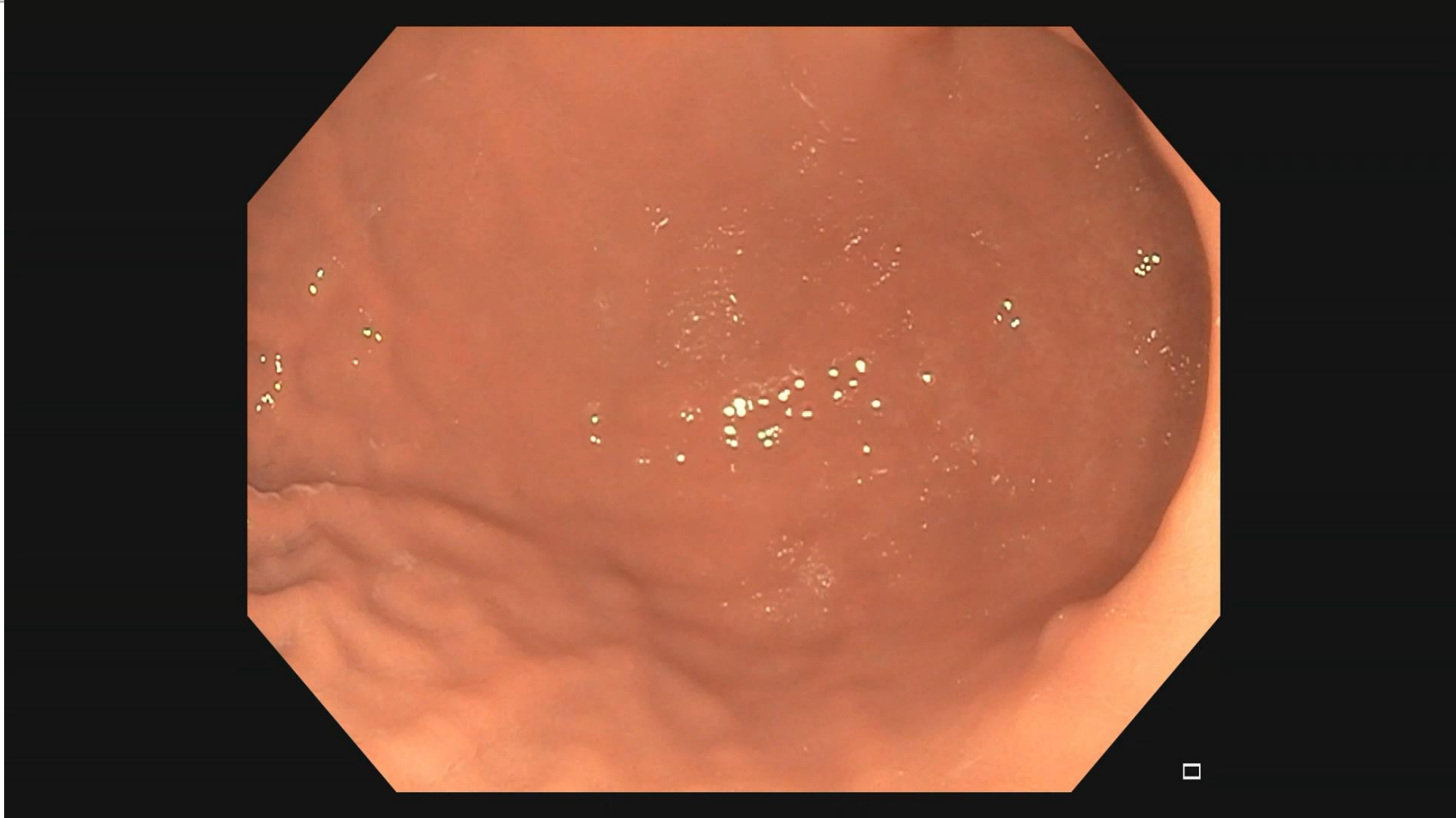


Figure 2. Endoscopic suturing system used in our study.

■ Gastric Remodeling: Endoscopic Sleeve Gastroplasty

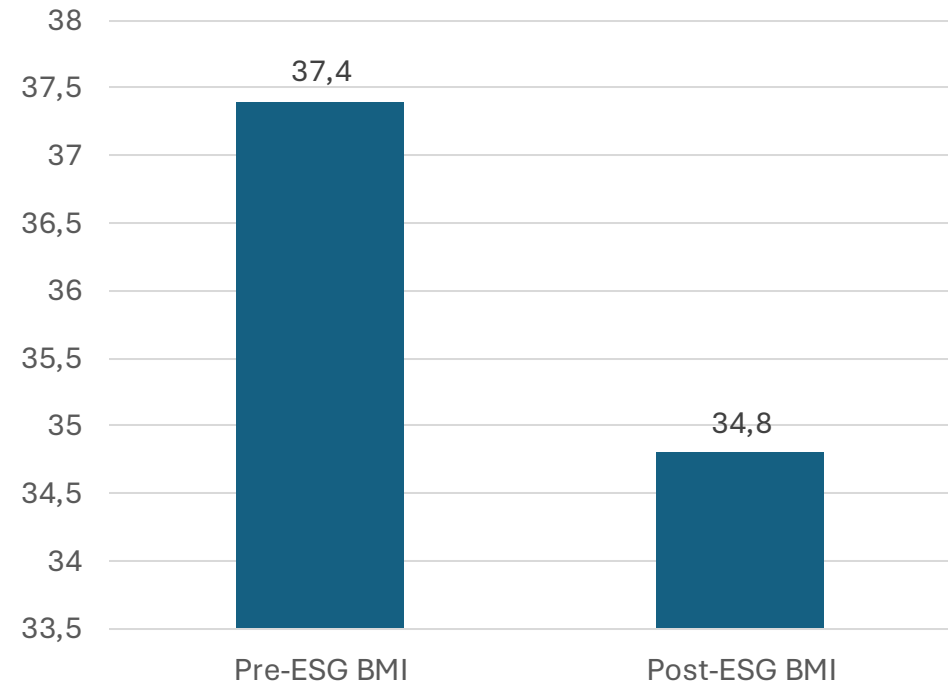


Gastric Remodeling: Endoscopic Sleeve Gastroplasty



■ Evolution of Endoscopic Sleeve Gastroplasty

- First human trial cases done in 2012 among 5 patients in India
- Procedure time: 3.5 hours
- No adverse events



Endoscopic Sleeve Gastroplasty Significantly Reduces Body Mass Index and Metabolic Complications in Obese Patients



Reem Z. Sharaiha,* Nikhil A. Kumta,* Monica Saumoy,* Amit P. Desai,* Alex M. Sarkisian,*
Andrea Benevenuto,* Amy Tyberg,* Rekha Kumar,‡ Leon Igel,‡ Elizabeth C. Verna,§
Robert Schwartz,* Christina Frissora,* Alpana Shukla,‡ Louis J. Aronne,‡ and Michel Kahaleh*

Table 3. Predictors of TWBL >15% at 12 Months

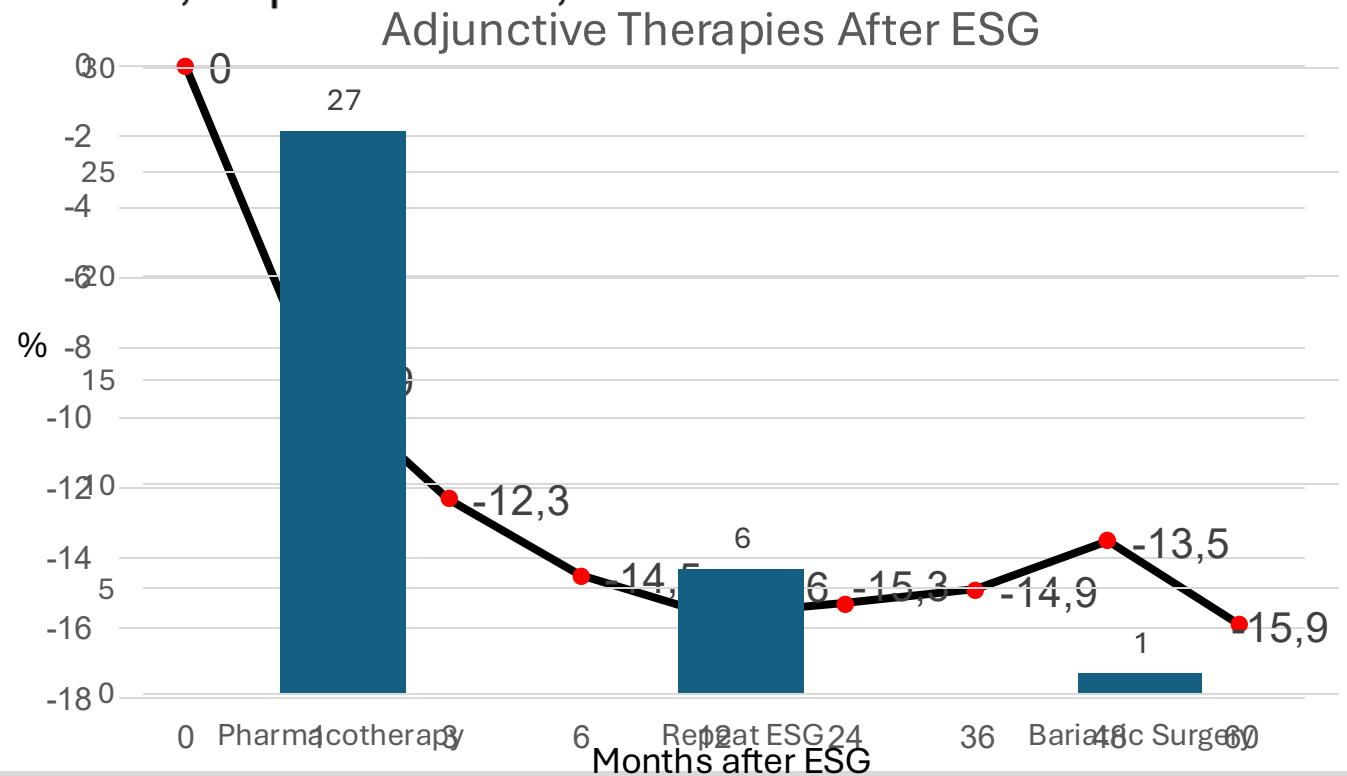
Variable	Univariate odds ratio	P value	Multivariable odds ratio	P value
Age	0.88 (0.8–0.96)	.007	0.85 (0.77–0.96)	.006
Race				
White	Reference		—	
Black	0.18 (0.03–1.2)	.76		—
Hispanic	0.22 (0.03–2.5)			
Other	0.55 (0.04–6.8)			
Gender (female)	0.21 (0.03–1.7)	.15	0.47 (0.03–6.6)	.57
Initial BMI	1.01 (0.92–1.1)	.78	1.1 (0.93–1.25)	.31
Case number				
<35	Reference	.03		.02
>35	10.3 (1.2–87.5)		18.6 (1.6–219.6)	

- August 2013 to March 2016
- 91 patients, mean BMI 40.7 kg/m²
- 20.9% total body weight loss at 24 months
- One serious adverse event: perigastric leak (1.1%)
- Predictors of TBWL >15% at 12 months included younger patients and endoscopist case number >35

Five-Year Outcomes of Endoscopic Sleeve Gastroplasty for the Treatment of Obesity

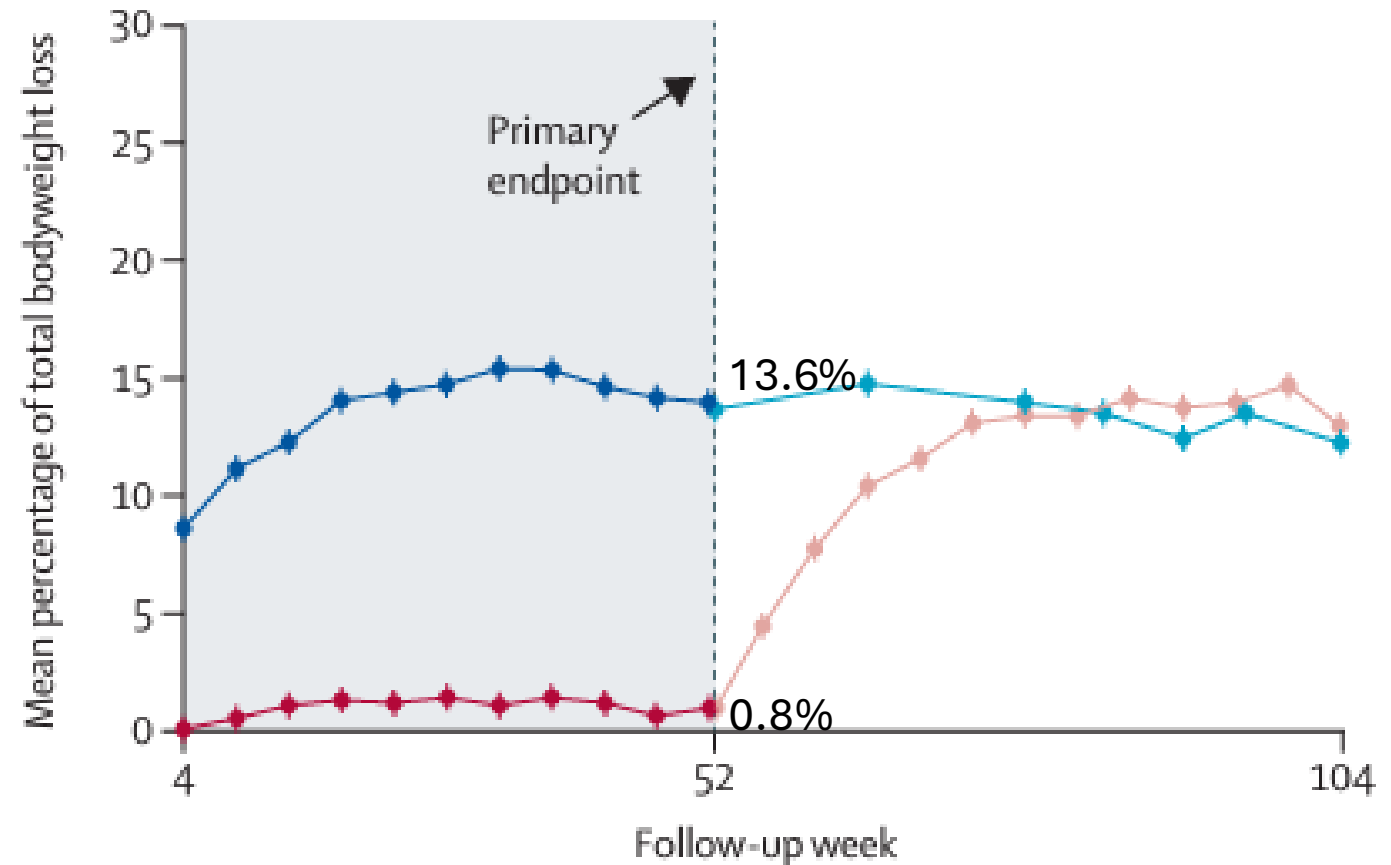
Reem Z. Sharaiha,^{*} Kaveh Hajifathalian,^{*} Rekha Kumar,[‡] Katherine Saunders,[‡] Amit Mehta,^{*} Bryan Ang,[§] Daniel Skaf,[§] Shawn Shah,^{*} Andrea Herr,^{*} Leon Igel,[‡] Qais Dawod,^{*} Enad Dawod,[§] Kartik Sampath,^{*} David Carr-Locke,^{*} Robert Brown,^{*} David Cohen,^{*} Andrew J. Dannenberg,^{||} Srihari Mahadev,^{*} Alpana Shukla,[‡] and Louis J. Aronne[‡]

- August 2013 to August 2019
- 216 patients mean BMI 39 kg/m²
- At 5 years, TBWL was 15.9% (n=68)
- Adverse Events:
 - Mild AE : 32%
 - Moderate AE: 1.3%

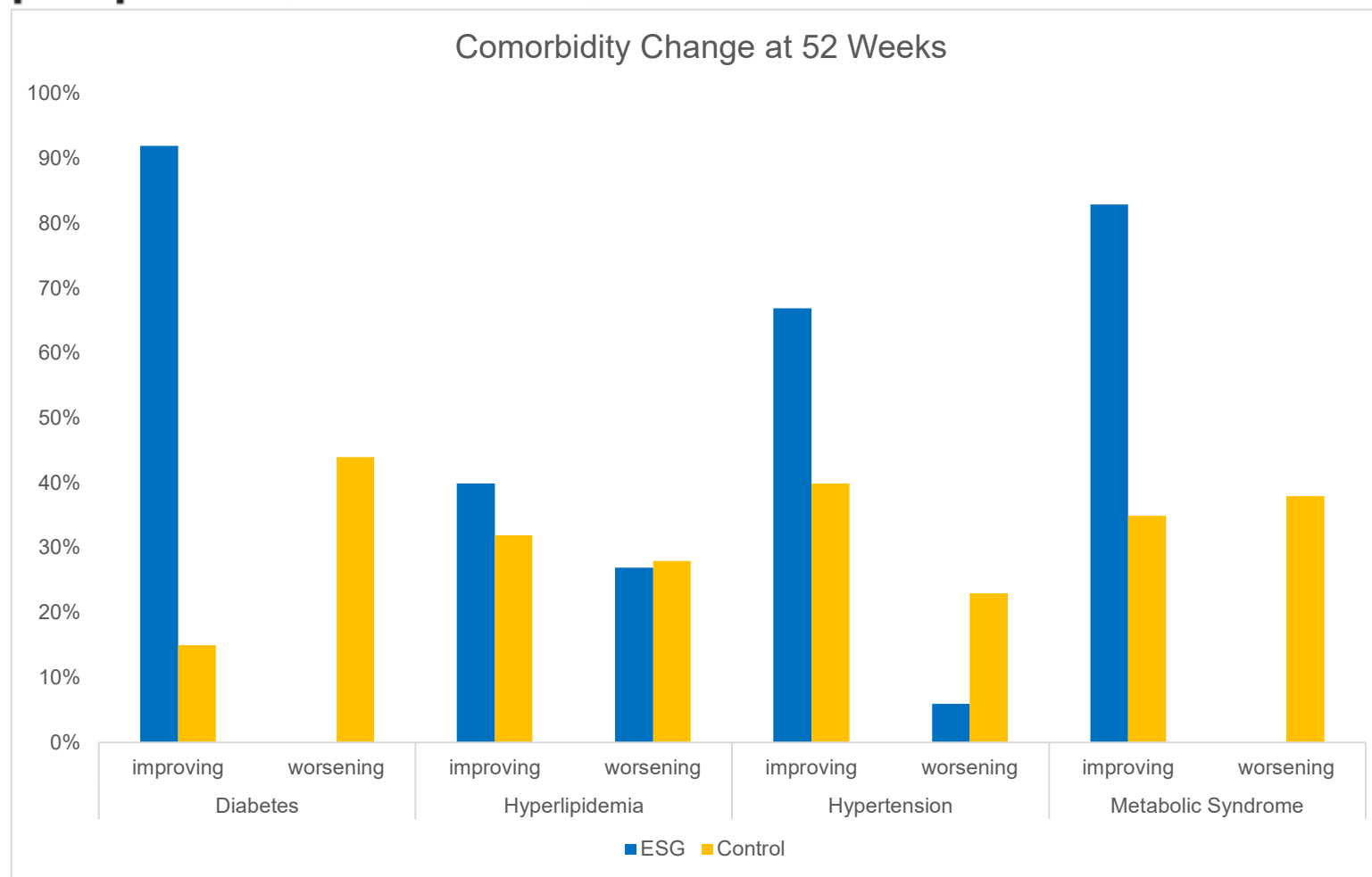


Endoscopic sleeve gastroplasty for treatment of class 1 and 2 obesity (MERIT): a prospective, multicentre, randomised trial

- MERIT trial : first randomized controlled trial on ESG
- US Centers, 21-65 years of age with class 1 or 2 obesity
- ESG with lifestyle modifications (n=68) vs. lifestyle modifications only (n=89)
- Allowed for potential retightening or crossover to ESG at 52 weeks



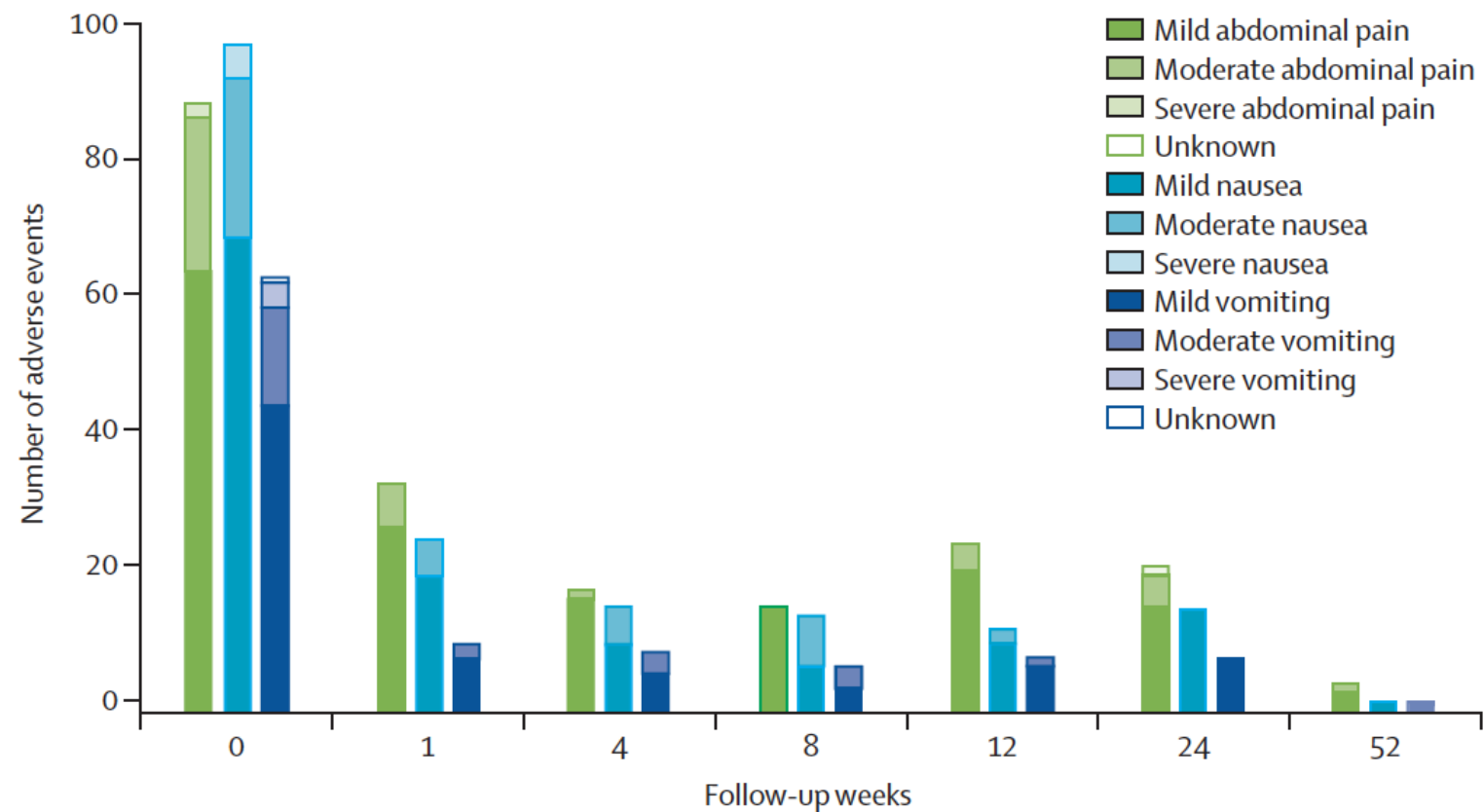
Endoscopic sleeve gastroplasty for treatment of class 1 and 2 obesity (MERIT): a prospective, multicentre, randomised trial



Endoscopic sleeve gastropasty for treatment of class 1 and 2 obesity (MERIT): a prospective, multicentre, randomised trial

Other Key Take-Aways from MERIT Trial

- 62% ESG group had accommodative GI symptoms post-procedure that improved after 1 week
- 2% ESG groups (n=3) had grade 3 adverse event:
 - Abdominal abscess
 - Upper GI bleed
 - Malnutrition requiring reversal
- 4% (n=6) required hospital admission for medical management of accommodative symptoms
- No worsening reflux
- Improvement in QOL and Depression in ESG group



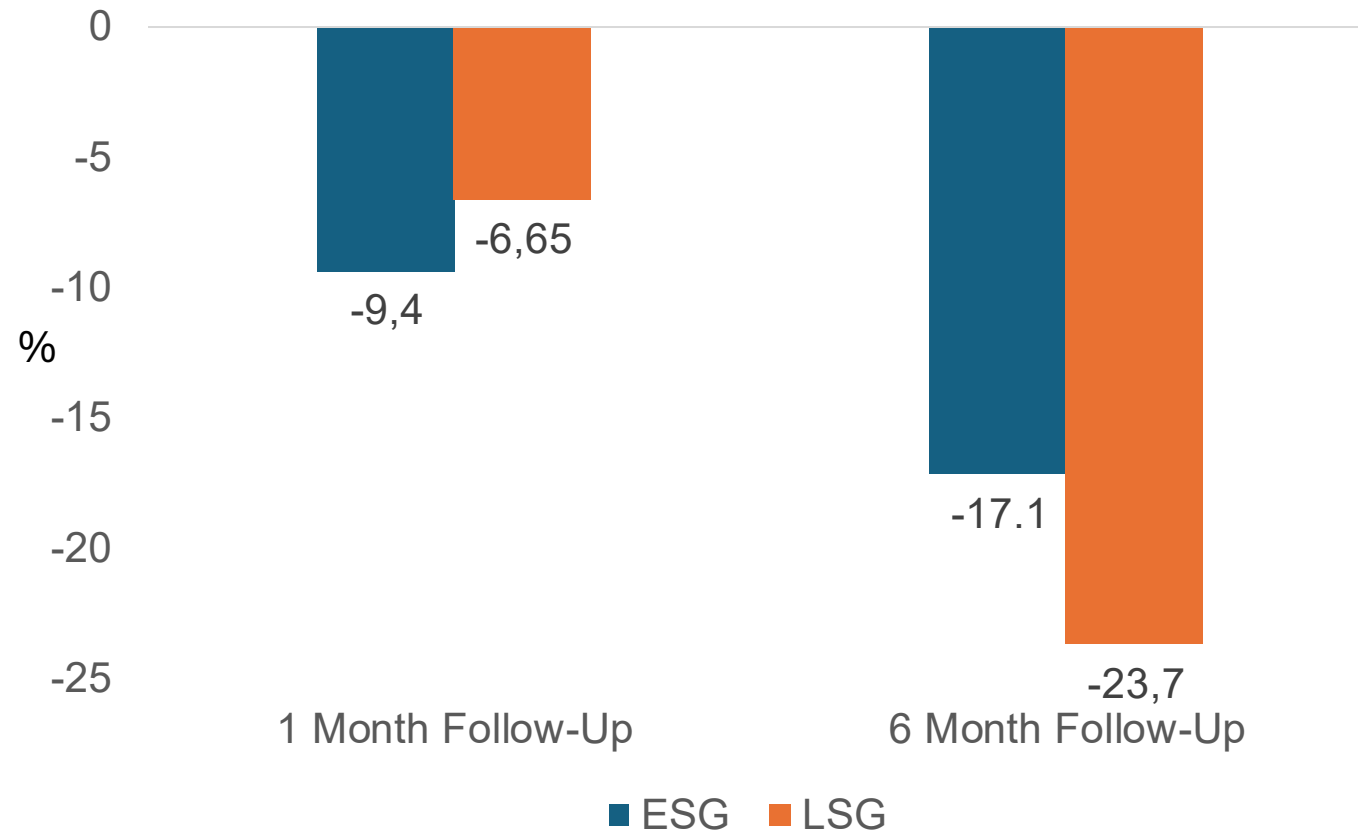
Endoscopic sleeve gastropasty versus laparoscopic sleeve gastrectomy: a case-matched study



Lea Fayad, MD,¹ Atif Adam, MD, MPH, PhD,² Michael Schweitzer, MD,³
Lawrence J. Cheskin, MD, FACP, FTOS,⁴ Tokunbo Ajayi, MD,⁵ Margo Dunlap, BSN,¹
Dilhana S. Badurdeen, MD,¹ Christine Hill, BA, BS,⁴ Neethi Paranj, MD,¹ Sepehr Lalezari, MD,³
Anthony N. Kalloo, MD,¹ Mouen A. Khashab, MD,¹ Vivek Kumbhari, MD¹

Baltimore, Maryland, USA

- Retrospective study matched for age, sex, and BMI
- 52 ESG patients matched to 83 LSG patients
- At 6-months, LSG patients with greater TBWL as compared to ESG group
- New onset GERD lower in ESG group (1.9%) as compared to LSG group (14.5%)



Cost-effectiveness of endoscopic, surgical and pharmacological obesity therapies: a microsimulation and threshold analyses

Monica Saumoy,¹ Devika Gandhi,² Seth Buller,³ Shae Patel,³ Yechezkel Schneider,⁴ Gregory Cote,⁵ Michael L Kochman,^{6,7} Nikhil R Thiruvengadam ,² Reem Z Sharaiha ⁸

- Key Takeaways:
- Class I obesity: ESG
 - Class II/III obesity: SG
 - Semaglutide not cost-effective
 - Cost of semaglutide to be cost-effective (annual):
 - Class I: \$5149
 - Class II: \$5847
 - Class III: \$7462

Table 2 Detailed analysis of outcomes and cost-effectiveness of weight management strategies							
Strategy*	Cost (2021 US\$)	Incr cost	Life-years lost due to obesity	Life-years gained†	Utility (QALY)	Incr utility	Incremental cost/QALY (ICER)
Patients with class I obesity (BMI 33)							
LI	124 195	--	0.858	--	15.634	--	
ESG	126 732	2537	0.501	0.358	16.252	0.618	4105
SG	139 971	13 239	0.468	0.391	16.372	0.120	110 325
Semaglutide	370 776	230 805	0.670	0.188	16.119	−0.253	Strong dominance‡
Patients with class II obesity (BMI 37)							
LI	142 606	--	1.560	--	14.828	--	
ESG	149 932	7326	0.967	0.592	15.474	0.642	Extended dominance§
SG	150 818	8212	0.555	1.005	16.224	1.396	5883
Semaglutide	389 008	238 190	1.082	0.477	15.414	−0.81	Strong dominance‡
Patients with class III obesity (BMI 44)							
LI	177 449	--	2.610	--	13.765	--	
ESG	183 355	5856	1.805	0.805	14.478	0.713	Extended dominance§
SG	188 844	11 395	1.198	1.412	15.222	1.457	7821
Semaglutide	409 571	220 727	1.976	0.634	14.427	−0.795	Strong dominance‡

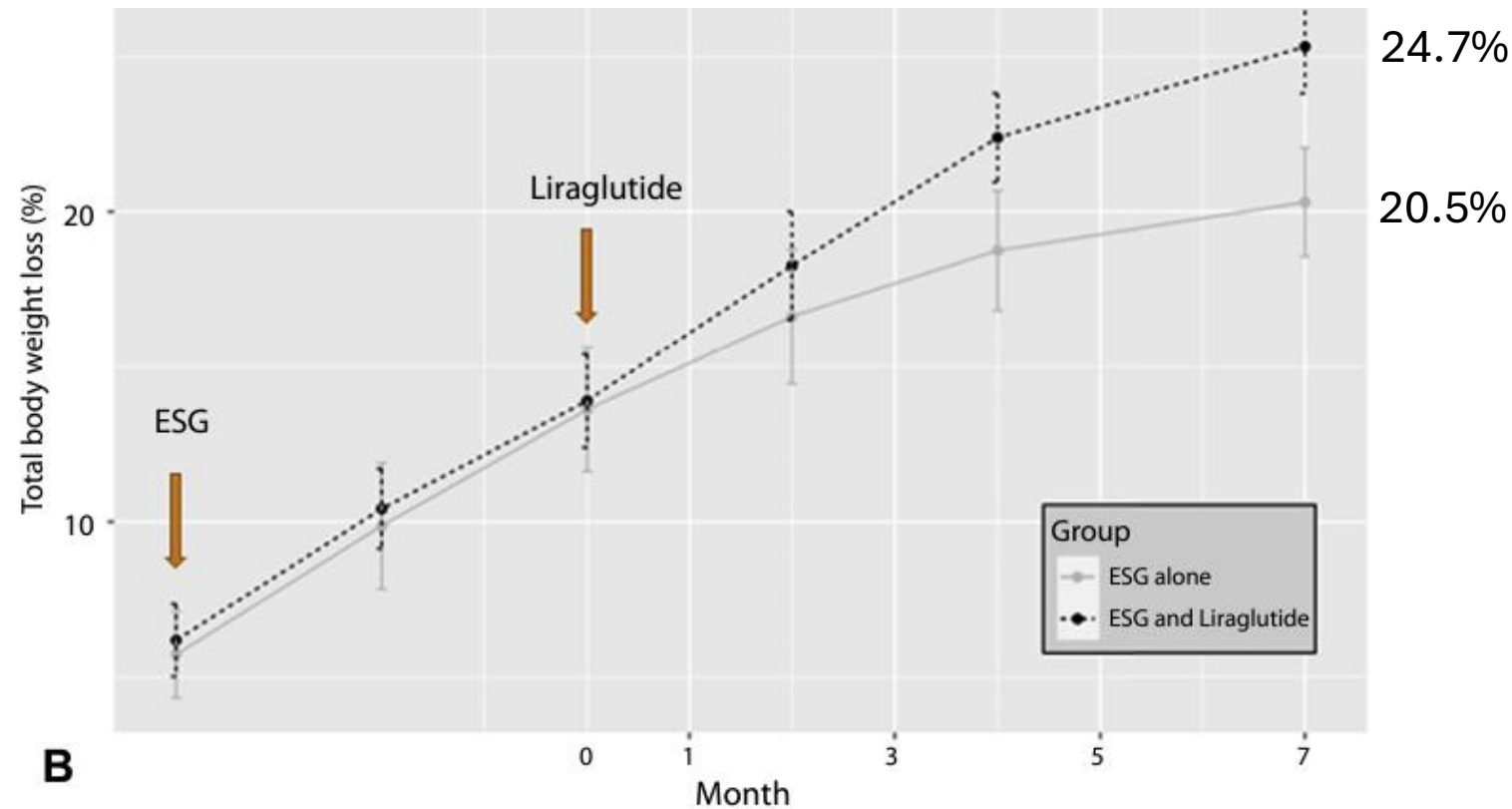
Endoscopic sleeve gastroplasty plus liraglutide versus endoscopic sleeve gastroplasty alone for weight loss

CME



Dilhana Badurdeen, MD,¹ Anna Carolina Hoff, MD,² Abdellah Hedjoudje, MD, MSc,¹ Atif Adam, PhD, MD,¹ Mohamad I. Itani, MD,¹ Jad Farha, MD,¹ Shahem Abbarh, MBBS,¹ Anthony N. Kalloo, MD,¹ Mouen A. Khashab, MD,¹ Vikesh K. Singh, MD, MSc,¹ Andrea Oberbach, MD, PhD, MPH,¹ Manoel Galvao Neto, MD,³ Sergio Barrichello, MD,⁴ Vivek Kumbhari, MD, PhD¹

- Retrospective study at 3 outpatient centers
- Liraglutide offered to all patients 5 months after ESG
- ESG-L patients matched 1:1 to ESG only patients



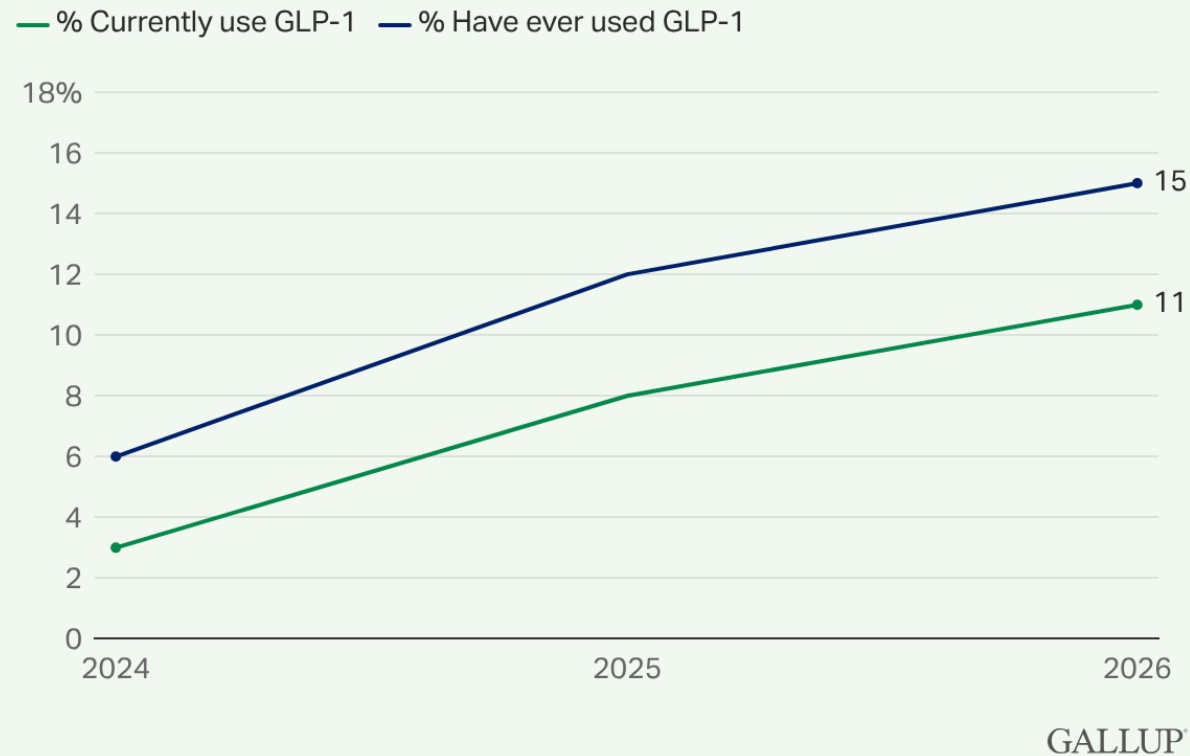
Insurance Coverage for ESG

Table 1. Frequency of coverage for primary and secondary bariatric therapy and documented requirements for covering revisional therapy among the top 25 insurers

	Covered	Not covered	
Primary Therapy			
ESG, n (%)	0 (0)	25 (100)	0.001
IGB, n (%)	0 (0)	25 (100)	0.001
Revisional Therapy			
Revision of sleeve gastrectomy, n (%)	7 (28)	18 (72)	0.001
Transoral outlet reduction, n (%)	7 (28)	18 (72)	0.001
Surgical revision, n (%)	20 (80)	5 (20)	0.05

The Future of ESG

Usage of GLP-1 Medications for Weight Loss Continues to Gain in Popularity



■ Endoscopic Bariatric Therapies

Gastric

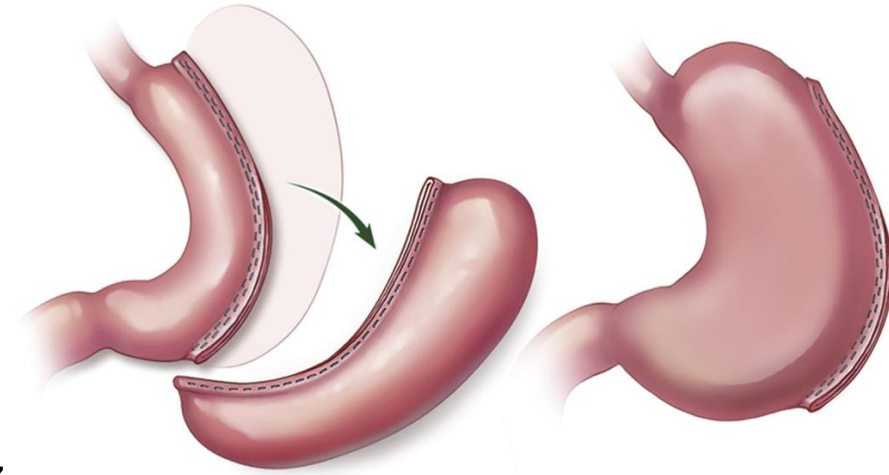
→ Gastric Remodeling
Outlet Reduction
Procedureless
Space Occupying
Outlet Obstruction
Aspiration

Small Bowel

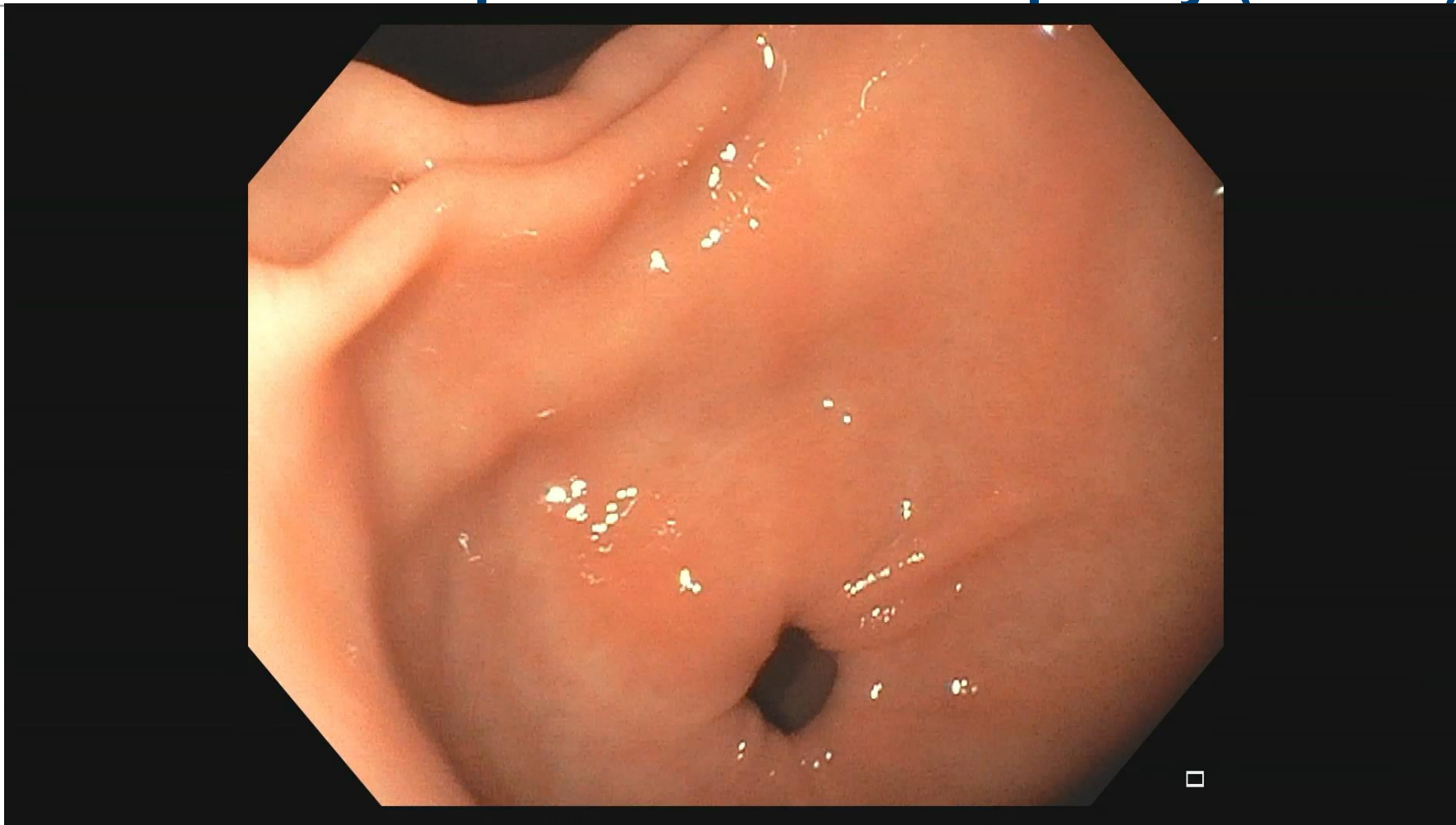
Sleeves
Duodenal Resurfacing
Flow altering

■ Revisional Endoscopic Sleeve Gastroplasty (r-ESG)

- **What is it:**
 - Reduction of a dilated laparoscopic sleeve gastrectomy using the approach used for an ESG
 - Aims to reduce the volume of the dilated gastric sleeve and shorten its length.
- **Who Qualifies?**
 - Weight recurrence or inadequate weight loss after laparoscopic sleeve gastrectomy with a BMI of at least 27 kg/m²
 - High risk for surgical revision to Roux-en-Y gastric bypass or do not want to pursue surgery



■ Revisional Endoscopic Sleeve Gastroplasty (r-ESG): Video

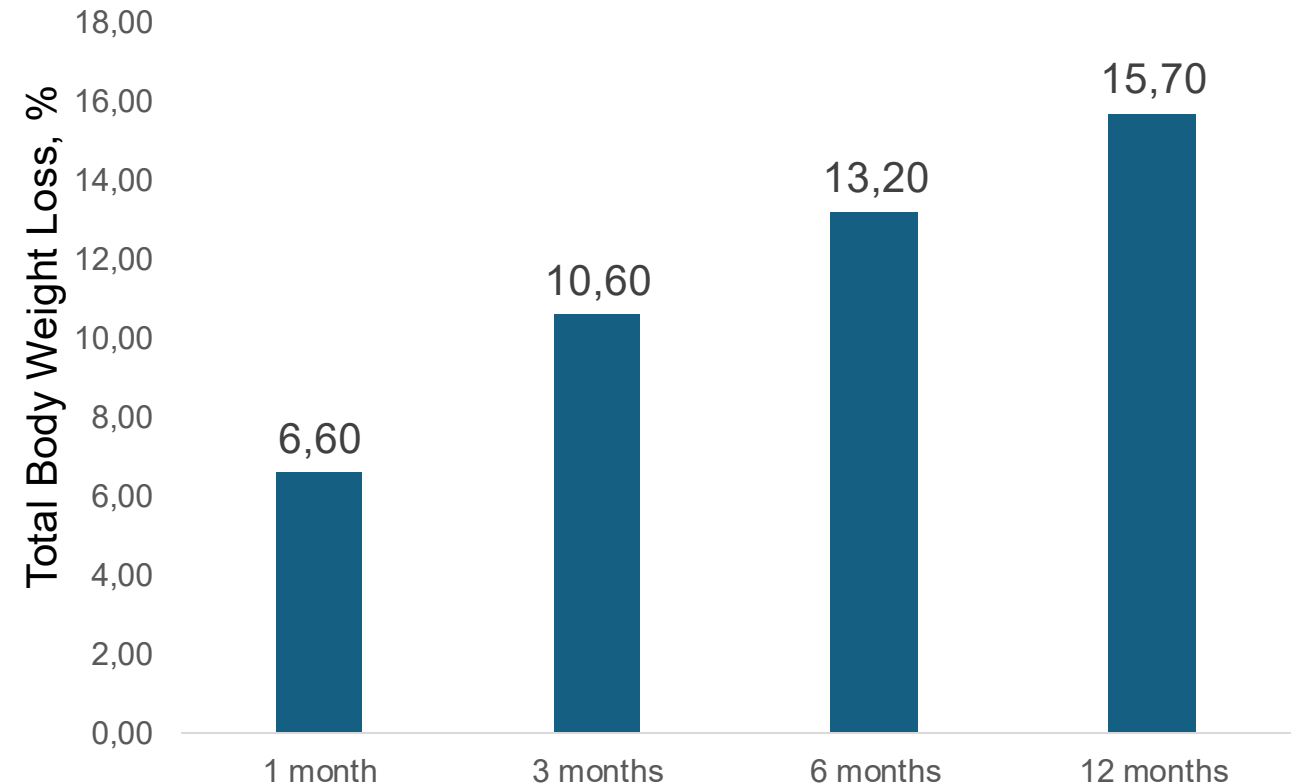


Revisional endoscopic sleeve gastroplasty of laparoscopic sleeve gastrectomy: an international, multicenter study



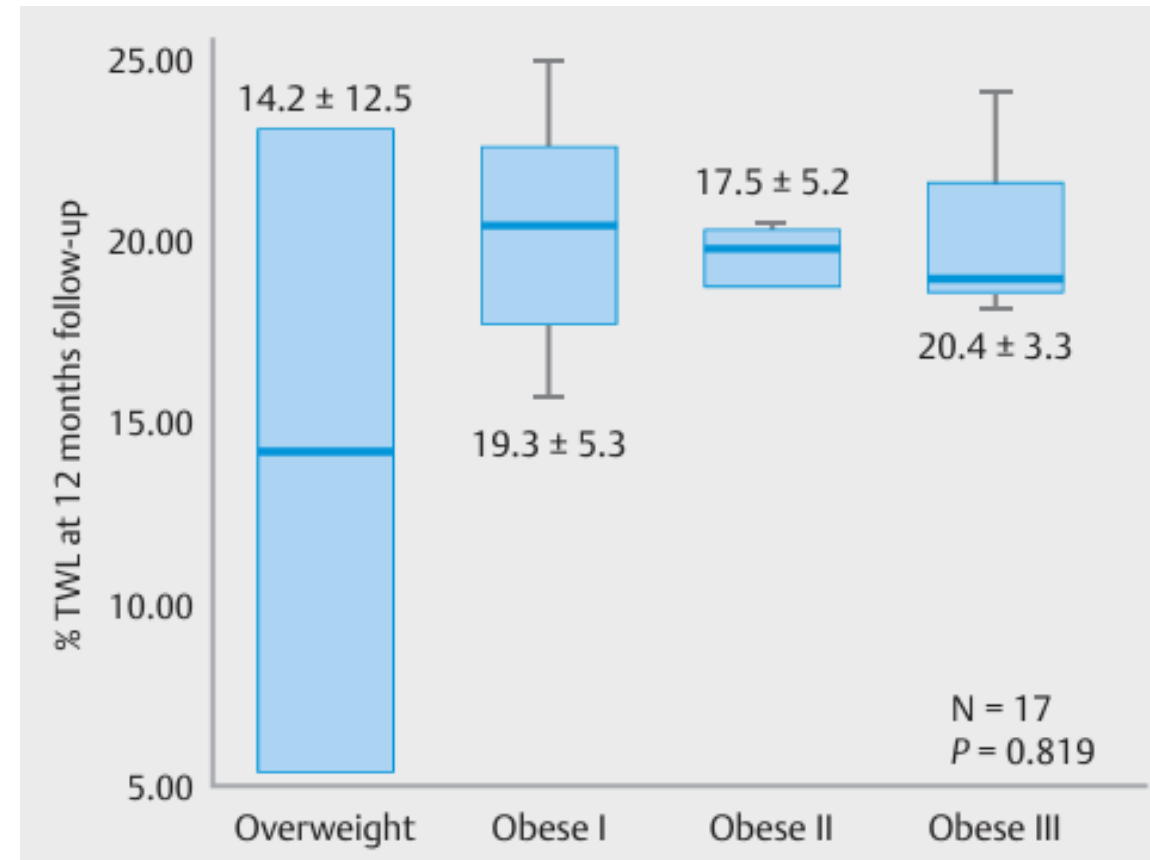
Daniel B. Maselli, MD,¹ Aayed R. Alqahtani, MD,² Barham K. Abu Dayyeh, MD, MPH,^{1*} Mohamed Elahmedi, MBBS,² Andrew C. Storm, MD,¹ Reem Matar, B.Sc,¹ Jose Nieto, DO,³ Andre Teixeira, MD,⁴ Maryam Al Khatry, MD,⁵ Manoel Galvao Neto, MD, MSc,⁶ Vivek Kumbhari, MD,⁷ Eric J. Vargas, MD,¹ Veeravich Jaruvongvanich, MD,¹ Manpreet S. Mundi, MD,⁸ Ameya Deshmukh, DO,³ Mohamad I. Itani, MD,⁷ Jad Farha, MD,⁷ Christopher G. Chapman, MD,⁹ Reem Sharaiha, MD, MSc¹⁰

- Multicenter study with 82 adults who underwent r-ESG for weight recurrence after LSG
- 27.9 kg weight recurrence and mean weight of 128.2 kg
- TBWL at 1, 3, 6, and 12 months
- 13/82 (15.9%) patients started on anti-obesity medications after r-ESG to augment weight loss



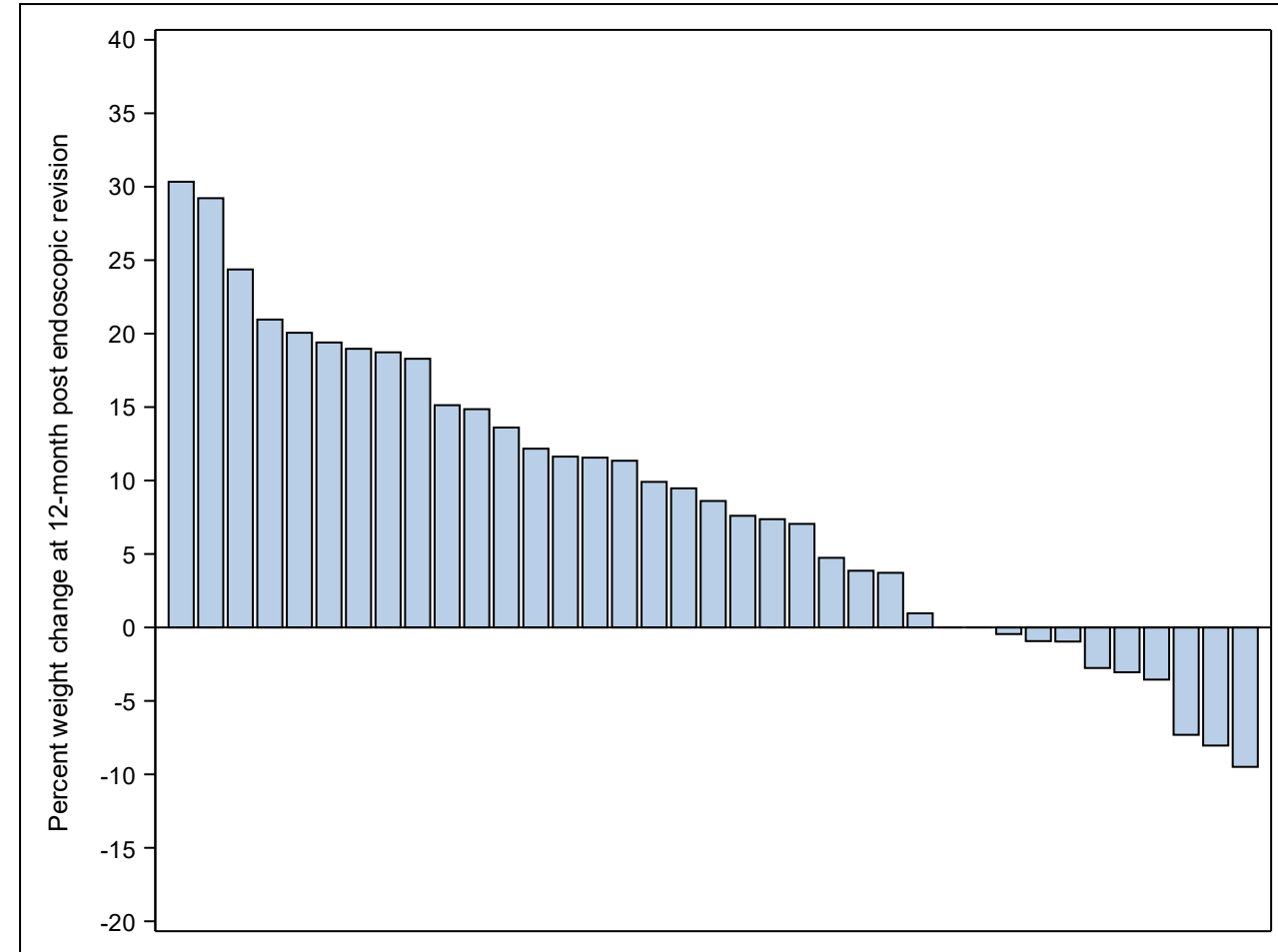
Endoscopic sleeve gastroplasty in the management of weight regain after sleeve gastrectomy ▶

- Multicenter retrospective study with 34 patients who underwent r-ESG after sleeve gastrectomy for weight recurrence.
- Mean overall percent total weight loss was 13.2%
- Also evaluate percent total weight loss by BMI categories of overweight and obesity at 1 year

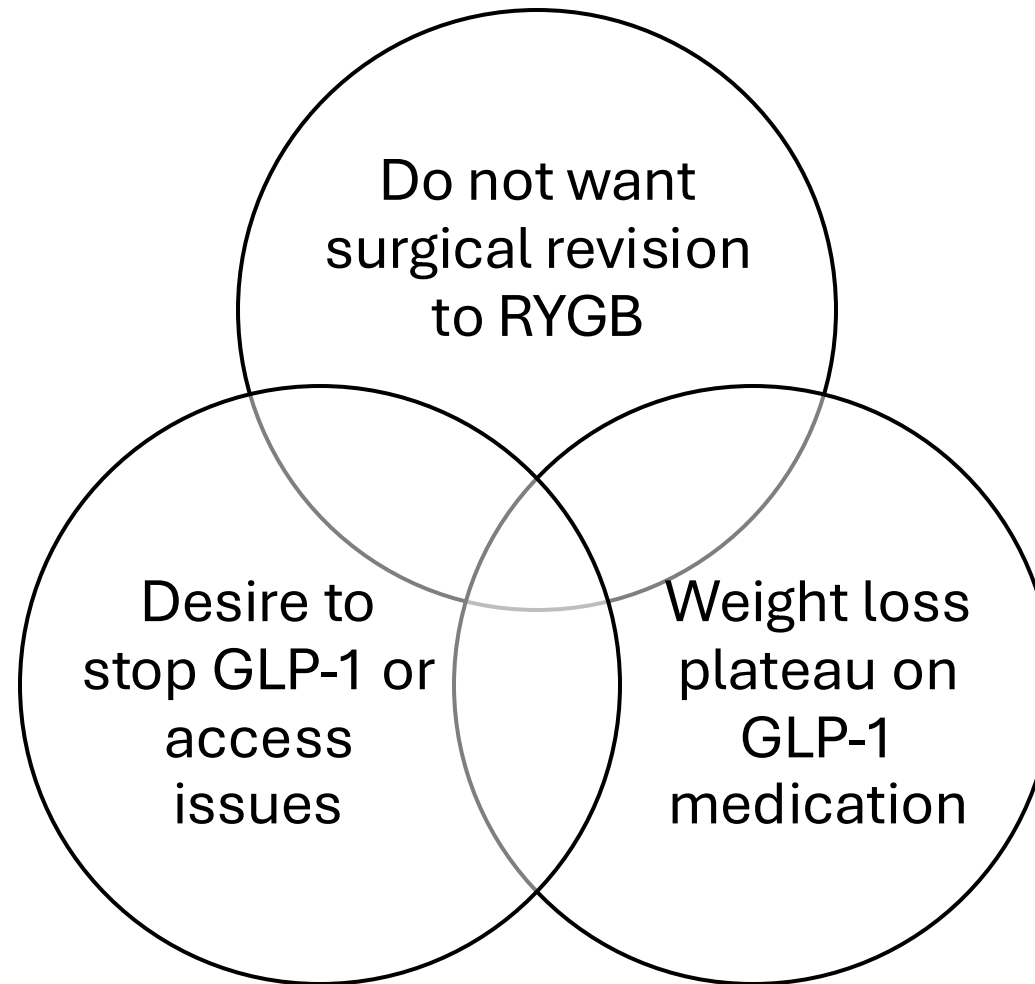


UTSW r-ESG experience

- 55 patients who underwent r-ESG from December 2020 to November 2023
- TBWL at 12-months was 8.6% (n= 37) , 10.7% at 18-months (n= 31), 12.6% at 24 months
- Other Key Points:
 - 65% of persons were on GLP-1s at time of procedure.



R-ESG in the GLP-1 Era: Who Benefits?



■ Endoscopic Bariatric Therapies

Gastric

→ Gastric Remodeling
Outlet Reduction
Procedureless
Space Occupying
Outlet Obstruction
Aspiration

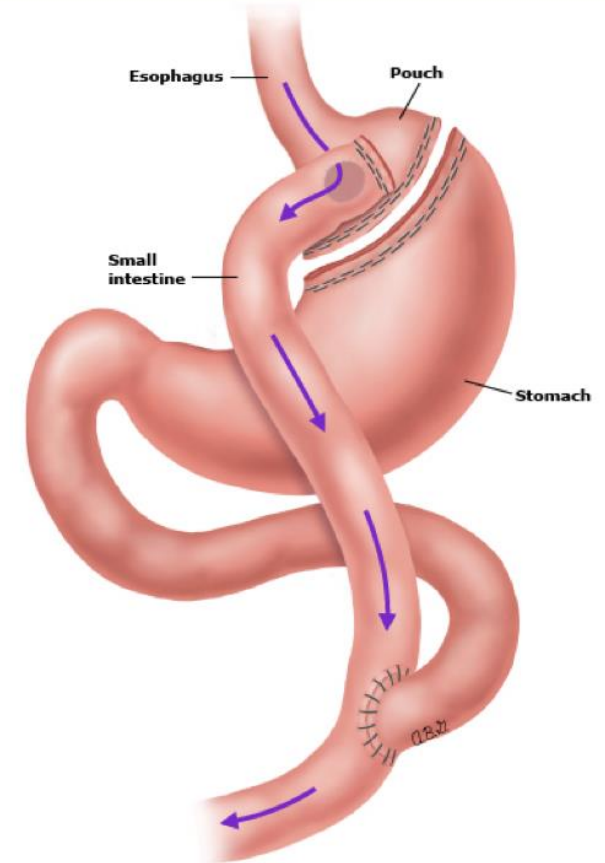
Small Bowel

Sleeves
Duodenal Resurfacing
Flow altering

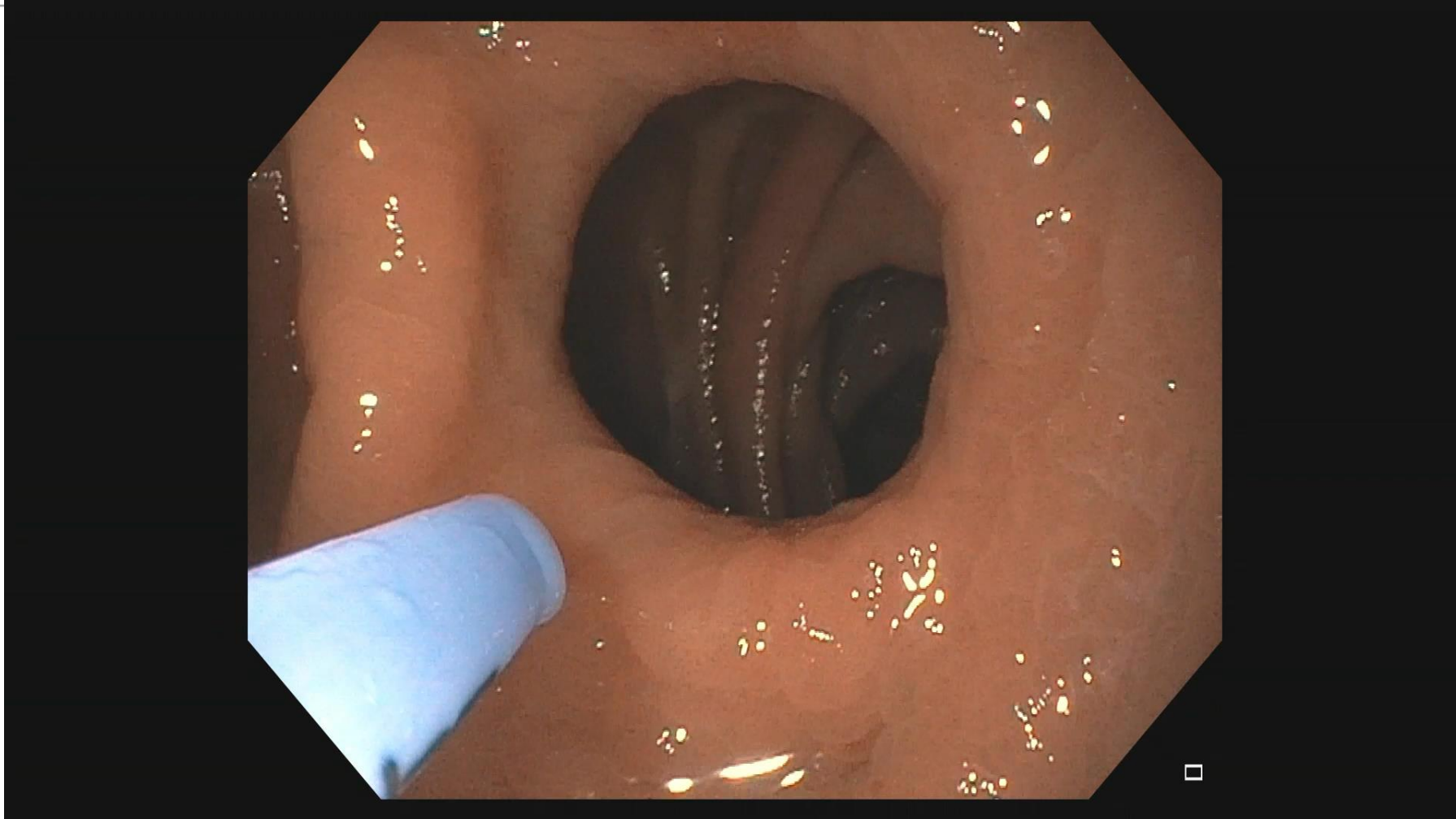
■ Transoral Gastric Outlet Reduction (TORE)

- **What is it:**
 - Transoral outlet reduction (TORe) uses APC and the OverStich Device to reduce the size of the GJ anastomosis.
- **Who Qualifies?**
 - Weight recurrence or inadequate weight loss after Roux-en-Y gastric bypass with BMI of at least 27 kg/m²
 - Dumping syndrome and/or reactive hypoglycemia after Roux-en-Y gastric bypass
 - Dilated gastrojejunal anastomosis

Roux-en-Y gastric bypass



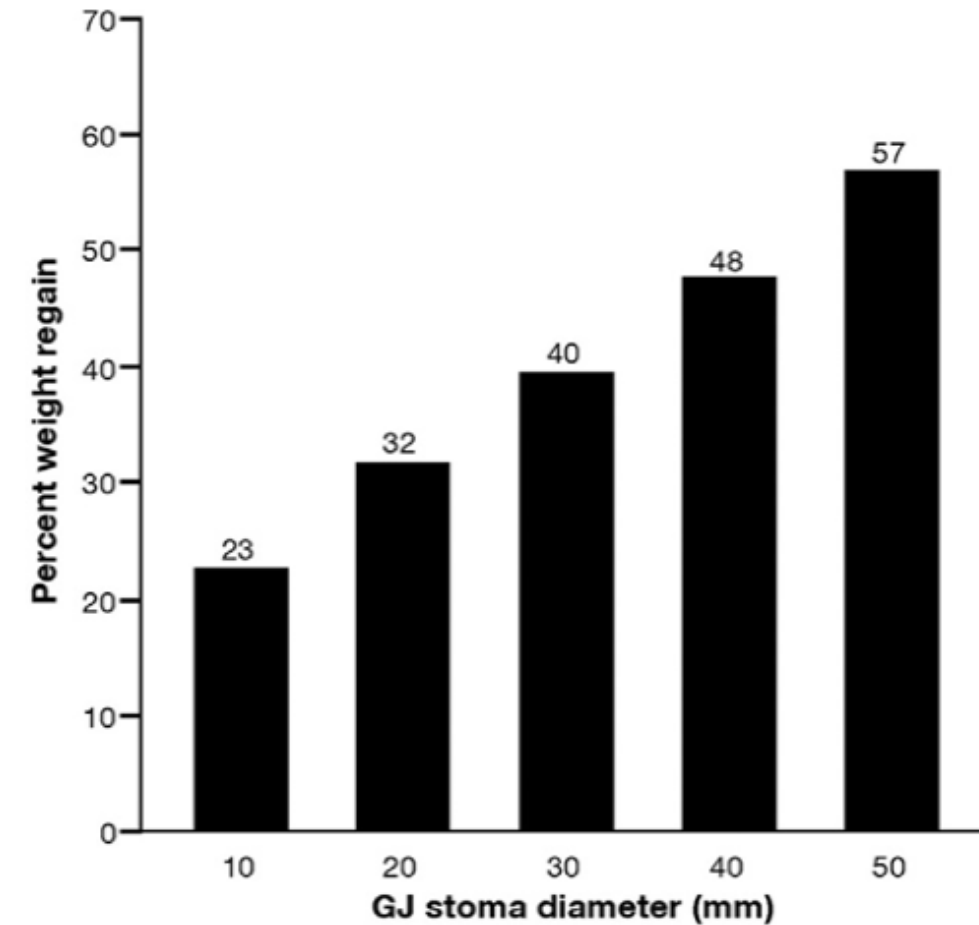
■ Transoral Gastric Outlet Reduction (TORE): Video



Gastrojejunal Stoma Diameter Predicts Weight Regain After Roux-en-Y Gastric Bypass

BARHAM K. ABU DAYYEH,^{*,‡} DAVID B. LAUTZ,[§] and CHRISTOPHER C. THOMPSON^{‡,||}

- 165 patients with weight recurrence after gastric bypass
- At 5 years after RYGB, each 10-mm increase in the GJ stoma diameter was associated with an 8% increase in the percentage of maximal weight loss after RYGB that was regained



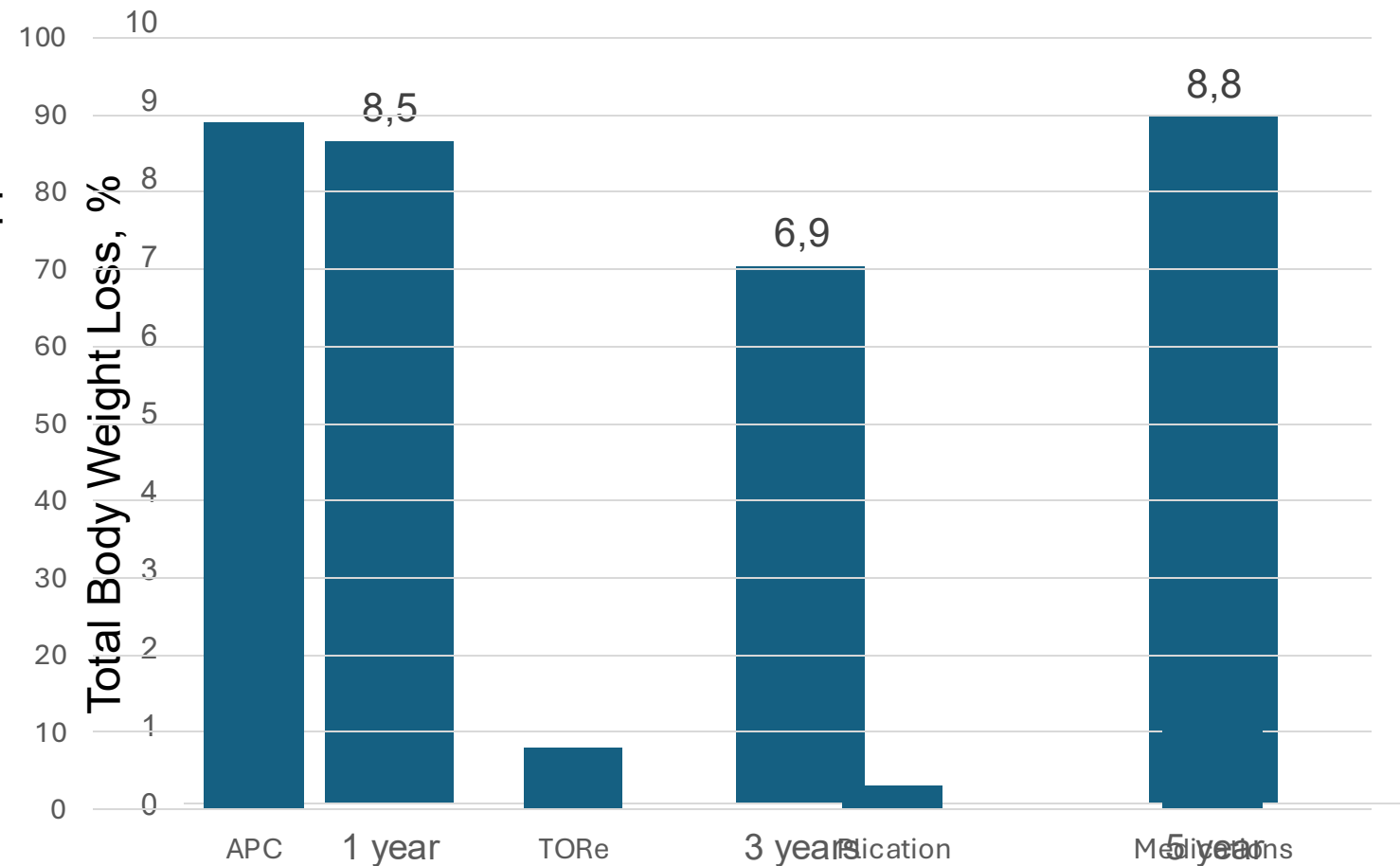
Five-year outcomes of transoral outlet reduction for the treatment of weight regain after Roux-en-Y gastric bypass CME

Pichamol Jirapinyo, MD, MPH,¹ Nitin Kumar, MD,² Mohd Amer AlSamman, MD,³
Christopher C. Thompson, MD, MSc¹

Boston, Massachusetts; Effingham, Illinois; Providence, Rhode Island, USA

- 331 patients underwent 342 TORe procedures for weight recurrence or inadequate weight loss after gastric bypass
- >50% of patients underwent pouch reinforcement sutures
- 39.3% (n=130) underwent additional therapy after TORe

Additional Adjunctive Therapies after TORe

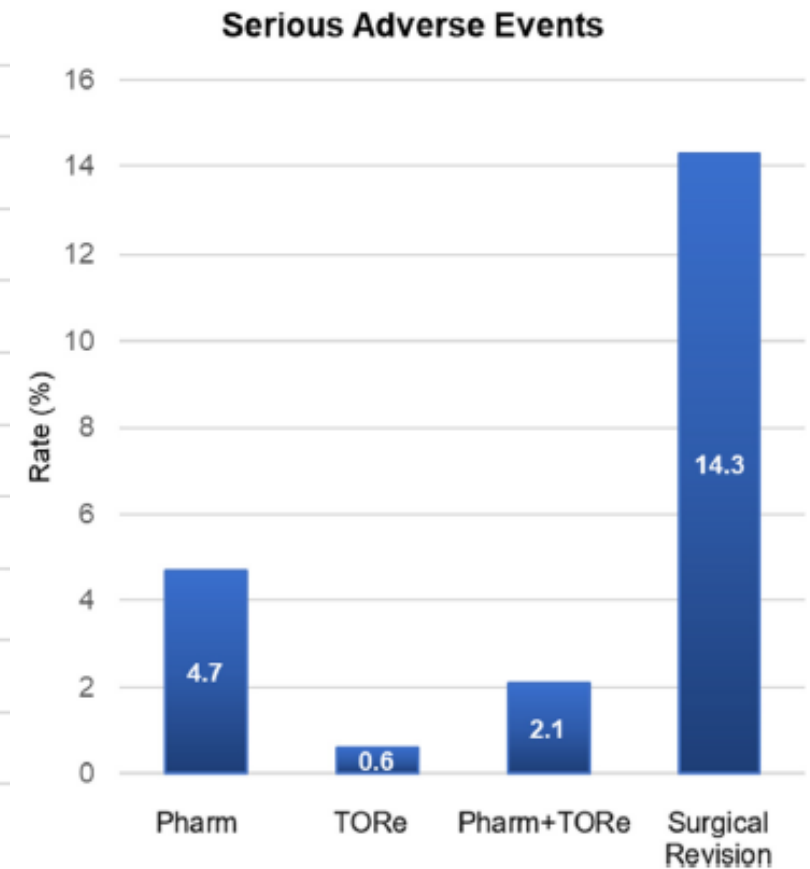
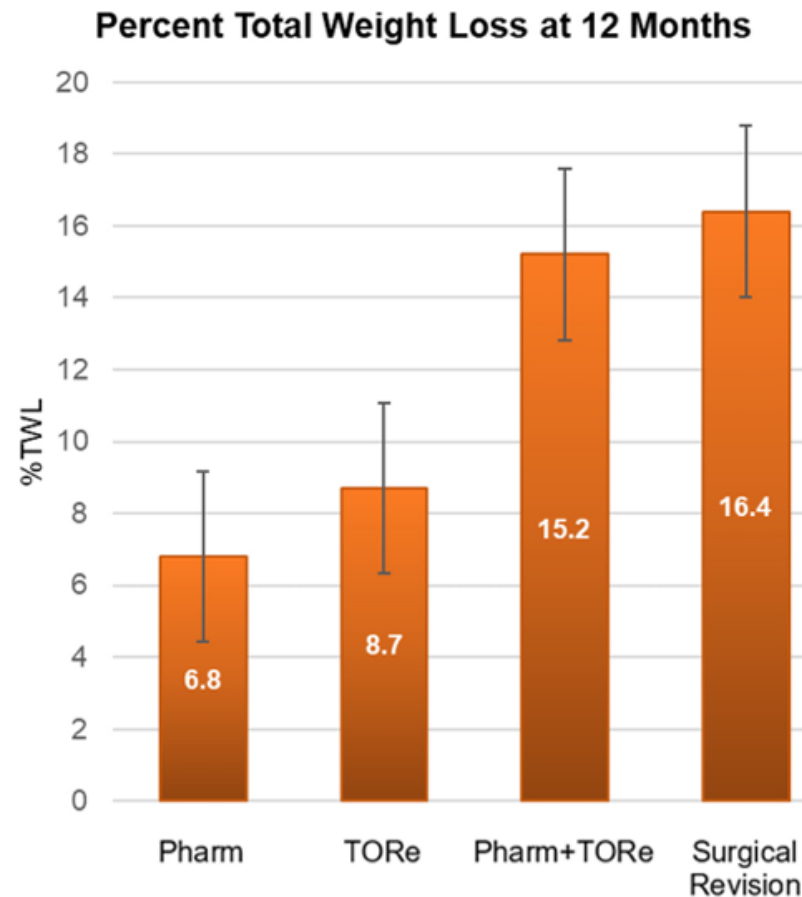


Combining transoral outlet reduction with pharmacotherapy yields similar 1-year efficacy with improved safety compared with surgical revision for weight regain after Roux-en-Y gastric bypass (with videos) 📺

Pichamol Jirapinyo, MD, MPH,^{1,2} Christopher C. Thompson, MD, MSc^{1,2}

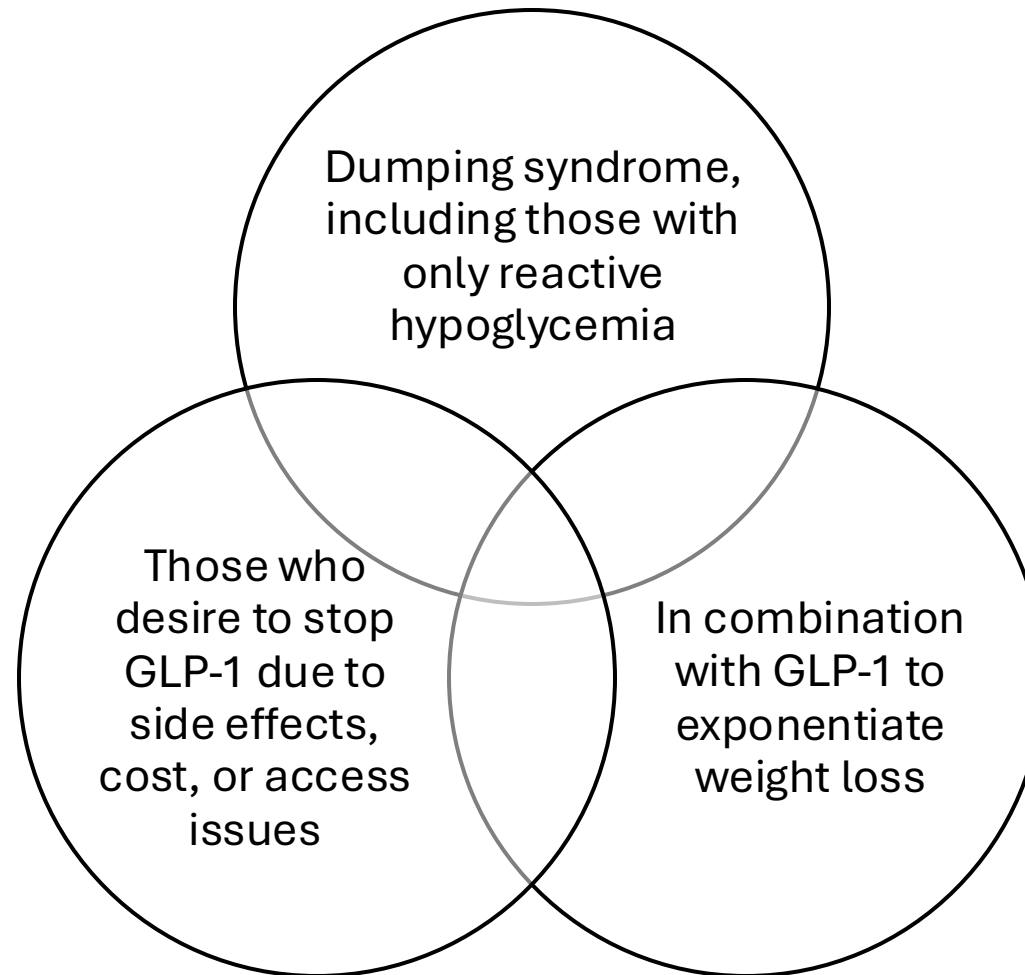
Boston, Massachusetts, USA

- 145 patients with RYGB who underwent combination therapy with anti-obesity medications
- 12-month percent total weight loss
 - Pharm + TORe > TORe alone
- Similar weight loss to surgical revision with less serious adverse events



UTSouthwestern
Medical Center

TORe in the GLP-1 Era: Who Benefits?



Summary

- Options for overweight and obesity have expanded beyond just surgical options to include powerful medications (GLP-1 receptor agonists) and minimally invasive endoscopic options
- Endoscopic bariatric therapies include primary (ESG) and revisional therapies (r-ESG and TORe)
- ESG is an effective option for weight reduction for class I obesity, especially given the current pricing of GLP-1 medications
- Revisional therapies, including r-ESG and TORe, are minimally invasive options to help treat weight recurrence and dumping symptoms
- Insurance coverage for primary endoscopic therapy is a major issue for ESG