New and Innovative Ways to Approach Obesity: Why Weight?

John Morton, MD, MPH, FACS, FASMBS

Vice-Chair, Quality and Performance Improvement

Division Chief, Bariatric & Min Invasive Surgery

Yale School of Medicine

Past-President, American Society of Metabolic and Bariatric Surgery, 2014-2015

Chair, Committee on Metabolic and Bariatric Surgery, American College of Surgeons

Medical Implications of Obesity

American Society of Clinical Oncology Summit on Addressing Obesity Through Multidisciplinary Provider Collaboration: Key Findings and Recommendations for Action

Jennifer A. Ligibel[1], Catherine M. Alfano[2], Dawn L. Hershman[3], Janette K. Merrill[4], Karen Basen-Engquist[5], Zachary T. Bloomgarden[6], Wendy Demark-Wahnefried[7], Suzanne Dixon[8], Sandra G. Hassink[9], John M. Jakicic[10], John Magaña Morton[11], Tochi M. Okwuosa[12], Tiffany M. Powell-Wiley[13], Amy E. Rothberg[14], Mark Stephens[15], Sarah E. Streett[11], Robert A. Wild[16], Eric A. Westman[17], Ronald J. Williams[18], Dana S. Wollins[4], and Clifford A. Hudis[4]

Another Disease-Medical Complications

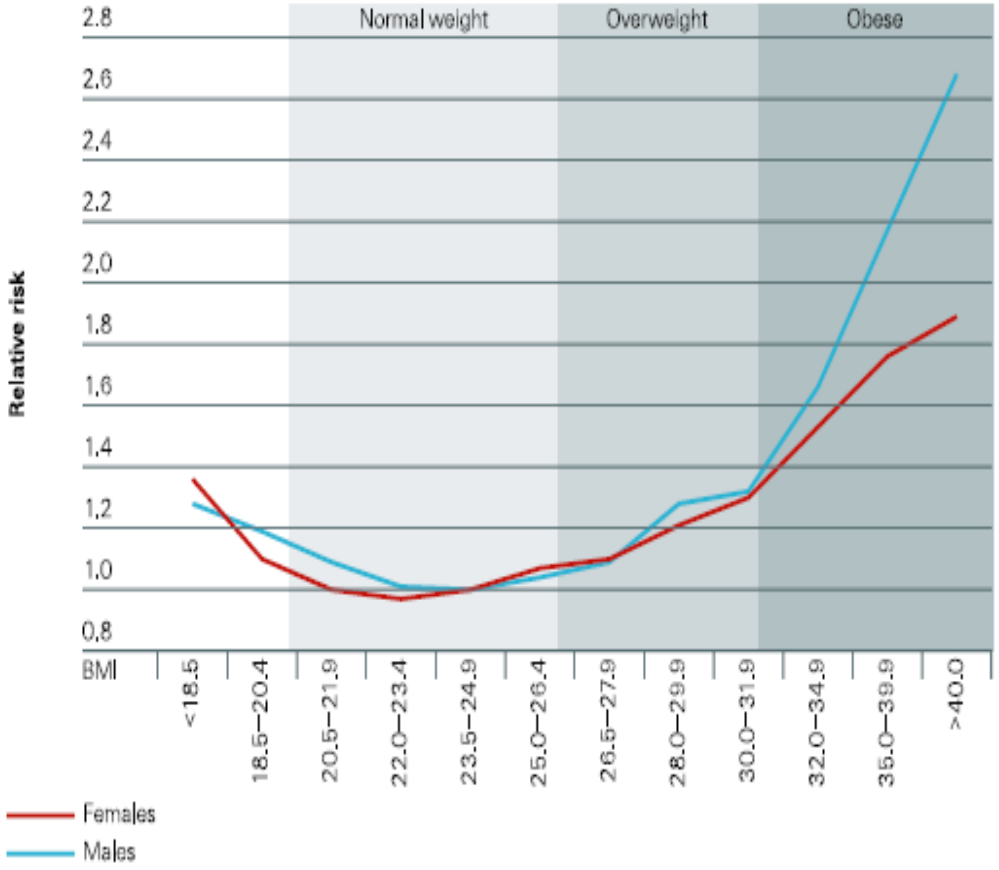
- **Increased complications after hip and knee arthroplasty in obese patients**
  - **Morbidly obese patients were at higher risk of in-hospital death after primary TKA compared with nonobese patients, (0.08% versus 0.02%; p<0.001) as well as postop complications, LOS. *(D'Apuzzo et al)***
  - **The infection rate was 0.37% in normal vs. 4.66% in the morbidly obese group. *(Jamsen et al)***
  - **Each 5-U increase in BMI>45 associated with an increased risk of in-hospital (OR, 1.69) and outpatient complications (OR, 2.71), readmission (OR, 2.0), LOS increased by 13.8% for each 5-U increase in BMI >45. *(Schwarzkopf et al)***

Obesity and Mortality

Figure 10
Relative risk of death (from all causes) by BMI
Source: New England Journal of Medicine

The relative risk of death increases appreciably at BMI levels above 30 and is also more significant in men than women

Note: The reference category was made up of adults with BMI between 23.5 and 24.9 and comprises of only non-smokers who have never smoked



2:49

PUBLIC HEALTH

Life Expectancy In U.S. Drops For First Time In Decades, Report Finds

December 8, 2016 · 12:02 AM ET
Heard on Morning Edition

ROB STEIN

Fewer people say they're on a diet

Nanci Hellmich, USA TODAY Published 5:06 p.m. ET Jan. 7, 2013 | Updated 5:19 p.m. ET Jan. 7,

Dieting is down, but many people still want to lose 20 pounds or more.

(Photo: Stockbyte)

Dieting is down but not out.

On average, about 20% of people said they were on a diet during any given week in 2012, down from a high of 31% in 1991, according to new data from the NPD Group, a market research firm.

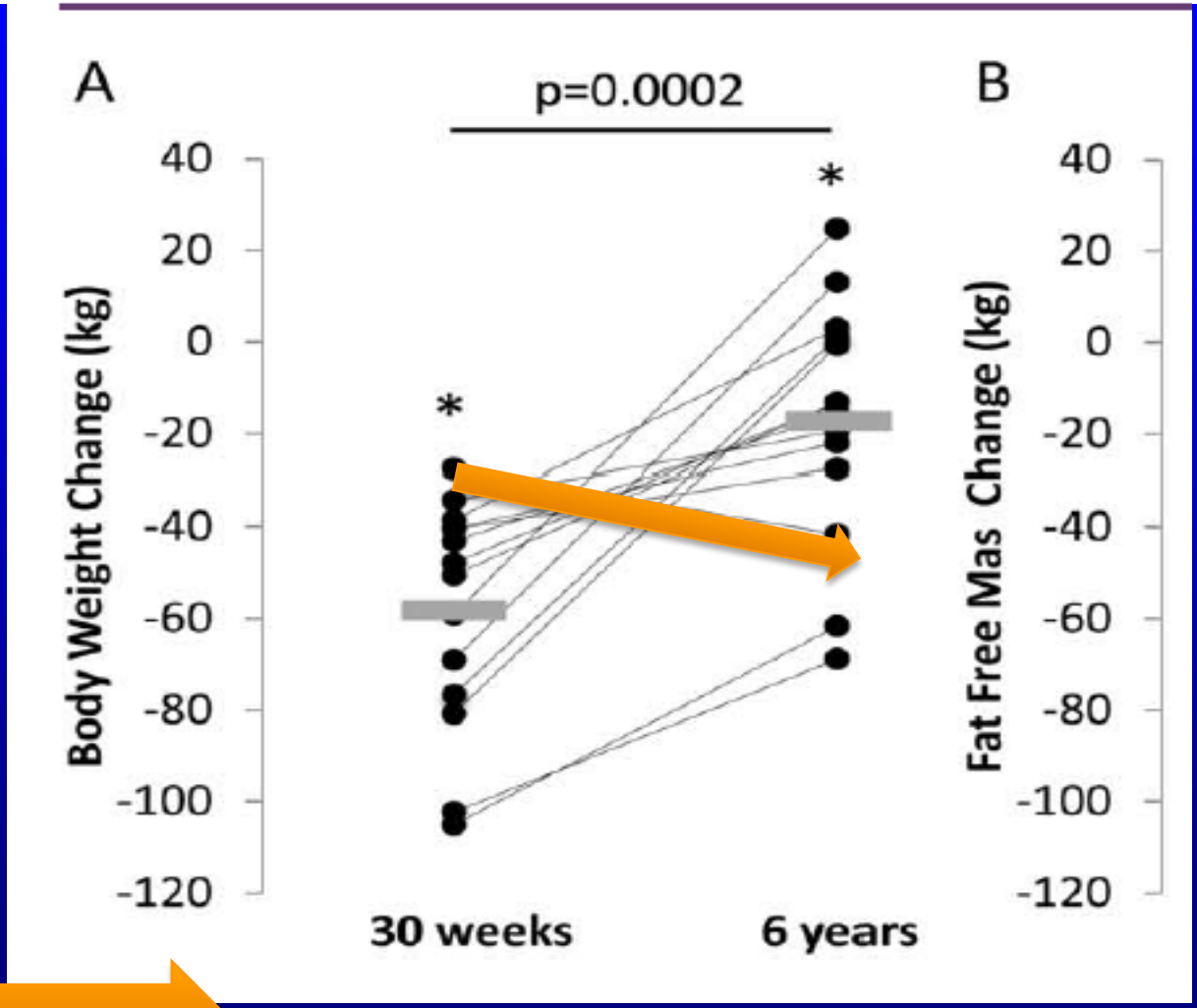
STORY HIGHLIGHTS

DO YOU HAVE TO BE SUPERHUMAN TO LOSE WEIGHT?

BY TARA PARKER-POPE

Persistent Metabolic Adaptation 6 Years After "The Biggest Loser" Competition

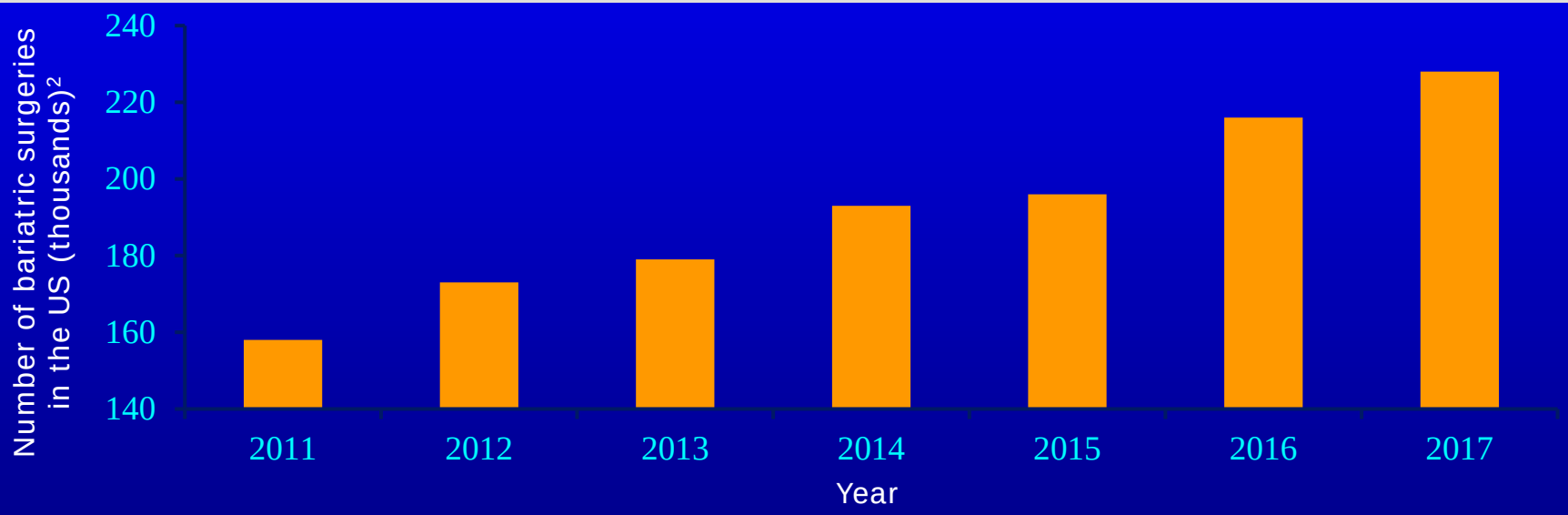
Erin Fothergill[1], Juen Guo[1], Lilian Howard[1], Jennifer C. Kerns[2], Nicolas D. Knuth[3], Robert Brychta[1], Kong Y. Chen[1], Monica C. Skarulis[1], Mary Walter[1], Peter J. Walter[1], and Kevin D. Hall[1]



Bariatric Surgery

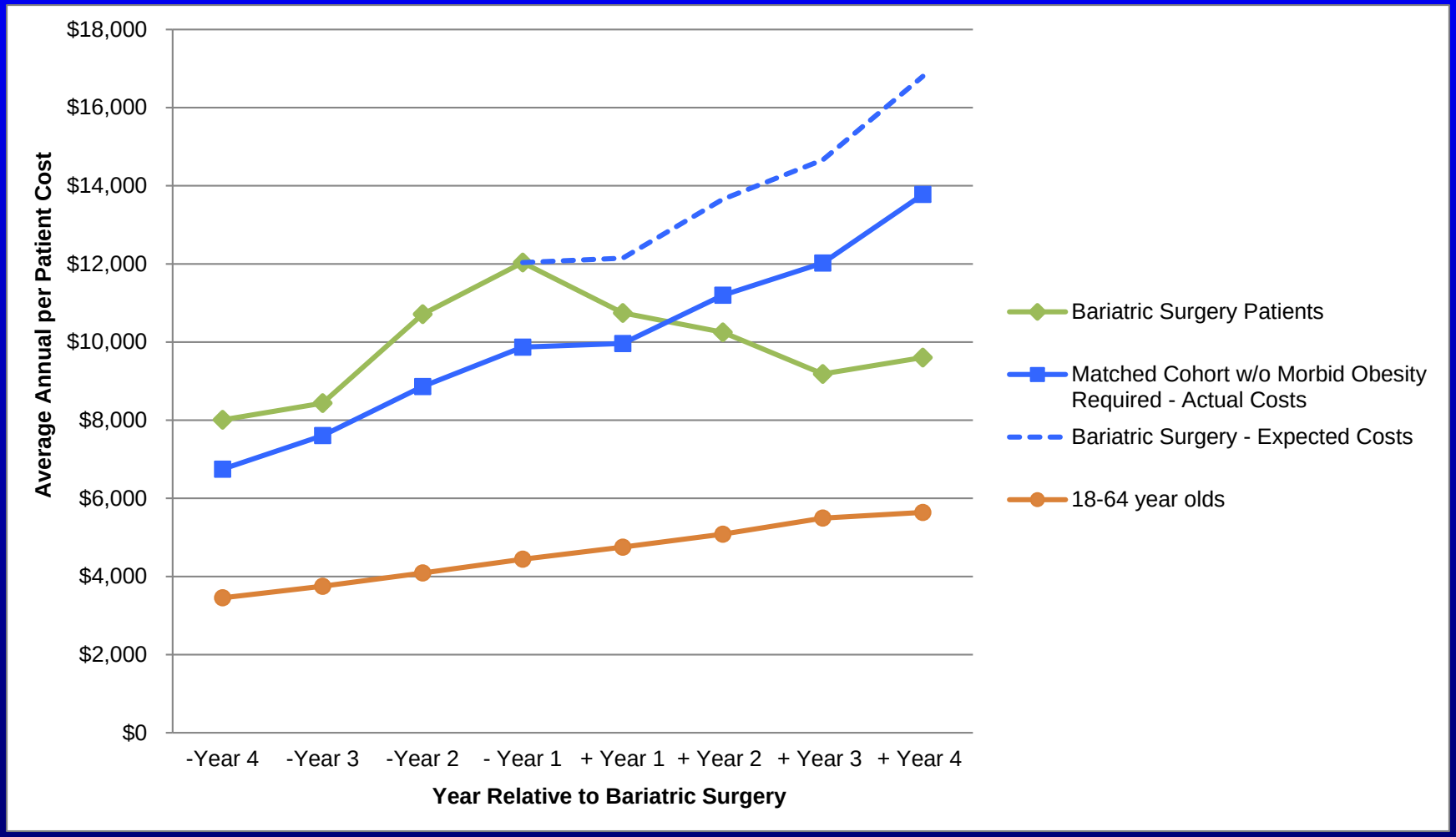
The number of bariatric surgeries is increasing; however, it remains low overall

Few patients are eligible, and **only 1–2%** of those eligible receive surgery[1]



1. Mattar S.G. Bariatric surgery: prevalence and treatment. Available at: https://asmbs.org/app/uploads/2018/09/5-bariatric-surgery-samer-matter.pdf;
2. ASMBS. Estimate of bariatric surgery numbers. 2018. Available at: https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers

Bending the Cost Curve
Cost Comparison: Diabetic lap-RYGB Patients vs Actual Costs of Matched Cohorts vs Expected Costs lap-RYGB
ASMBS 2017



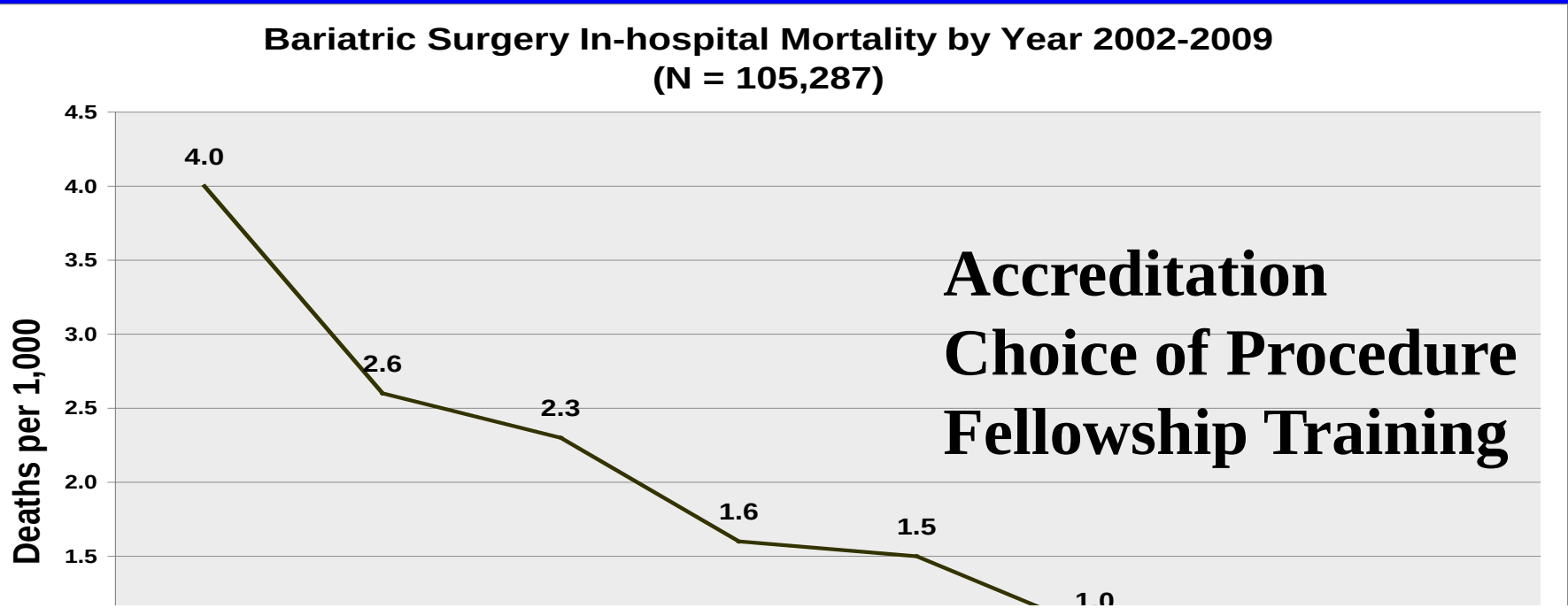
Obesity (2011) doi:10.1038/oby.2011.258

Obesity Disparities in Preventive Care: Findings From the National Ambulatory Medical Care Survey, 2005–2007

Tina Hernandez-Boussard[1], Shushmita M. Ahmed[1] and John M. Morton[1]

- **National Ambulatory Medical Care Survey (NAMCS) (N=866,415,856) 2005-7**
- **Obese patients were significantly less likely to receive:**
  - **breast examination (OR) 0.8**
  - **mammogram 0.7,**
  - **Pap smear 0.7, pelvic exam 0.8**
  - **rectal exam 0.7**
  - **tobacco education, 0.7**
  - **injury prevention education, 0.7**
- **Obese less likely to see physician at the index clinic visit (OR, 0.8) or receive psychotherapy referral (0.6).**

BARIATRIC SURGERY: SURGICAL SUCCESS STORY



Constructing a competency-based bariatric surgery fellowship training curriculum

Corrigan L. McBride, M.D., M.B.A., F.A.S.M.B.S., F.A.C.S.[a,*], Raul J. Rosenthal, M.D., F.A.C.S., F.A.S.M.B.S.[b], Stacy Brethauer, M.D., F.A.S.M.B.S.[c], Eric DeMaria, M.D., F.A.S.M.B.S.[j], John J. Kelly, M.D., F.A.S.M.B.S.[h], John M. Morton, M.D., M.P.H., F.A.S.M.B.S., F.A.C.S.[d],

Nguyen et al. SOARD 2012

What is the MBSAQIP?

- The **only US** nationwide accrediting body & quality improvement program for Metabolic & Bariatric Surgery Centers
- 845 Centers participating in the MBSAQIP
- Accredited centers must undergo a rigorous application process and onsite visit every 3 years to demonstrate that they meet accreditation standards and participate in the MBSAQIP Data Registry Platform
- Standards Approved for Endoscopic and Medical Weight Loss
- ACS Committee on Metabolic & Bariatric Surgery (CMBS)
  - Chair: John Morton, MD, FACS

MBSAQIP
METABOLIC AND BARIATRIC SURGERY ACCREDITATION AND QUALITY IMPROVEMENT PROGRAM

In-Patient Outcomes Morton, Ann Surg 2014

	Unaccredited	Accredited	P value
Total charges (mean), $	51,189	42,212	<0.0001
Any complication, %	12.3	11.3	0.001
Mortality, %	0.13	0.07	0.019
FTR, %	0.97	0.55	0.046

Abbreviations: FTR, failure to rescue

Bariatric Surgery Outcomes in US Accredited vs Non-Accredited Centers: A Systematic Review

Dan Azagury, MD, John M Morton, MD, MPH, FACS, FASMBS

10/13 Papers Show Benefit: 1.5 million patients

MBSAQIP Accreditation Required

- **Blue Cross Centers of Distinction**
- **Aetna Institutes of Quality**
- **United/Optum Centers of Excellence**
- **Cigna Bariatric Centers of Excellence**

BlueCross BlueShield

Bariatric Centers of Excellence Network

UnitedHealthcare

aetna®

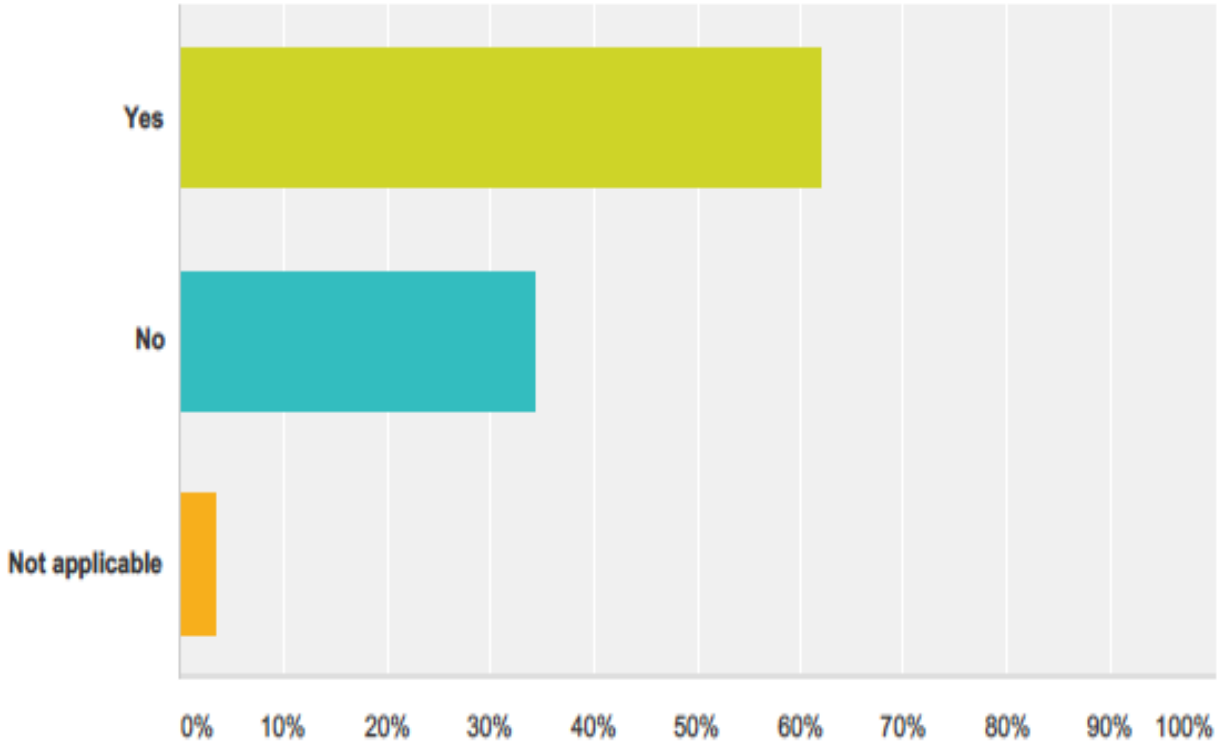
CIGNA JPMC Bariatric Centers of Excellence

CIGNA

http://dx.doi.org/10.1016/j.jamcollsurg.2016.06.014
ISSN 1072-7515/16

Q11 Do you provide medical weight loss in your program?

Answered: 314 Skipped: 4



CNN Health » Food | Fitness | Wellness | Parenting | Vital Signs Live TV U.S. Edition +

Weight loss balloons now linked to 12 deaths

By Susan Scutti, CNN
Updated 6:22 PM ET, Mon June 4, 2018

More from CNN

Dazzling fireboat artwork by Tauba Auerbach drops anchor in New...

Indonesian woman held captive in cave for 15 years, police say

Primary Balloon Insertions (Operation Dates in 1/1/2016 - 12/31/2016)
Total Number of Cases: 1003
Total Number of Centers: 108

Cases with 30-Day Occurrences

Occurrence	N
Mortality	0
Morbidity	2
All Occurences Morbidity	43
Leak	0
Bleeding	3
SSI	0
All Cause Reoperation	9
Related Reoperation	9
All Cause Intervention	42
Related Intervention	36
All Cause Readmission	22
Related Readmission	20

2001-2020

- 2001
- OPEN Gastric Bypass and VBG
- 1 Medication
- No Devices
- No Accreditation
- 15 Fellowships

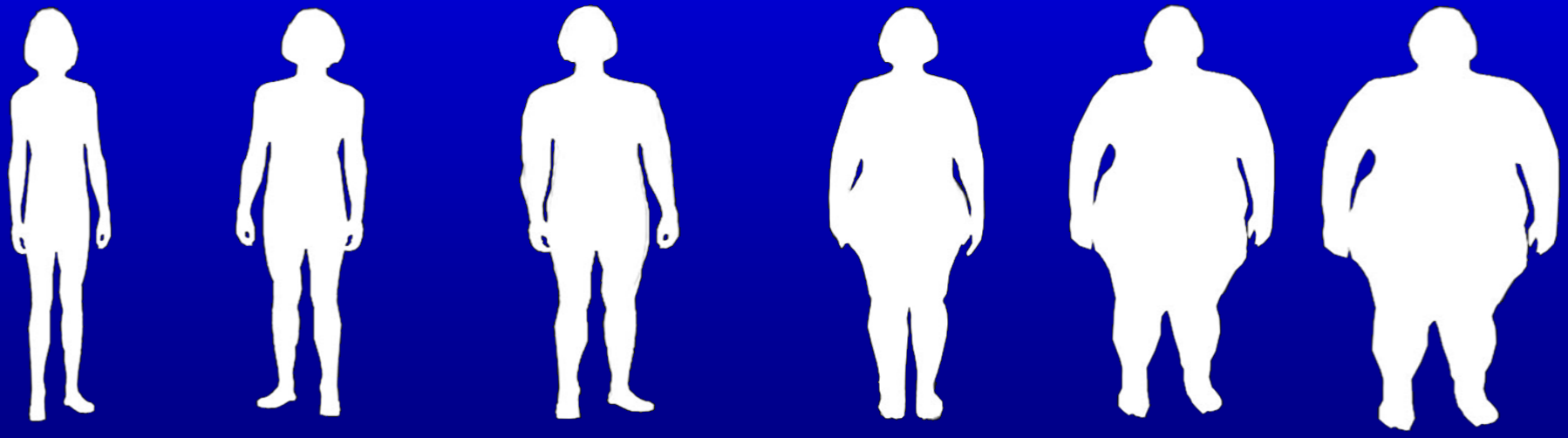
- 2020
- Gastric Band, Sleeve Gastrectomy, Gastric Bypass, Duodenal Switch
- 6 Medications
- 5 Devices
- 850 Hospitals Accredited
- 57 Fellowships

Obesity Care

JAMA 2010;303:235-41

Degrees of Obesity – Body Mass Index

NORMAL	OVERWGT	STAGE 1	STAGE 2	STAGE 3	STAGE 4
18.5 – 24.9	25 – 29.9	30 – 34.9	35 – 39.9	≥ 40-50	≥ 50

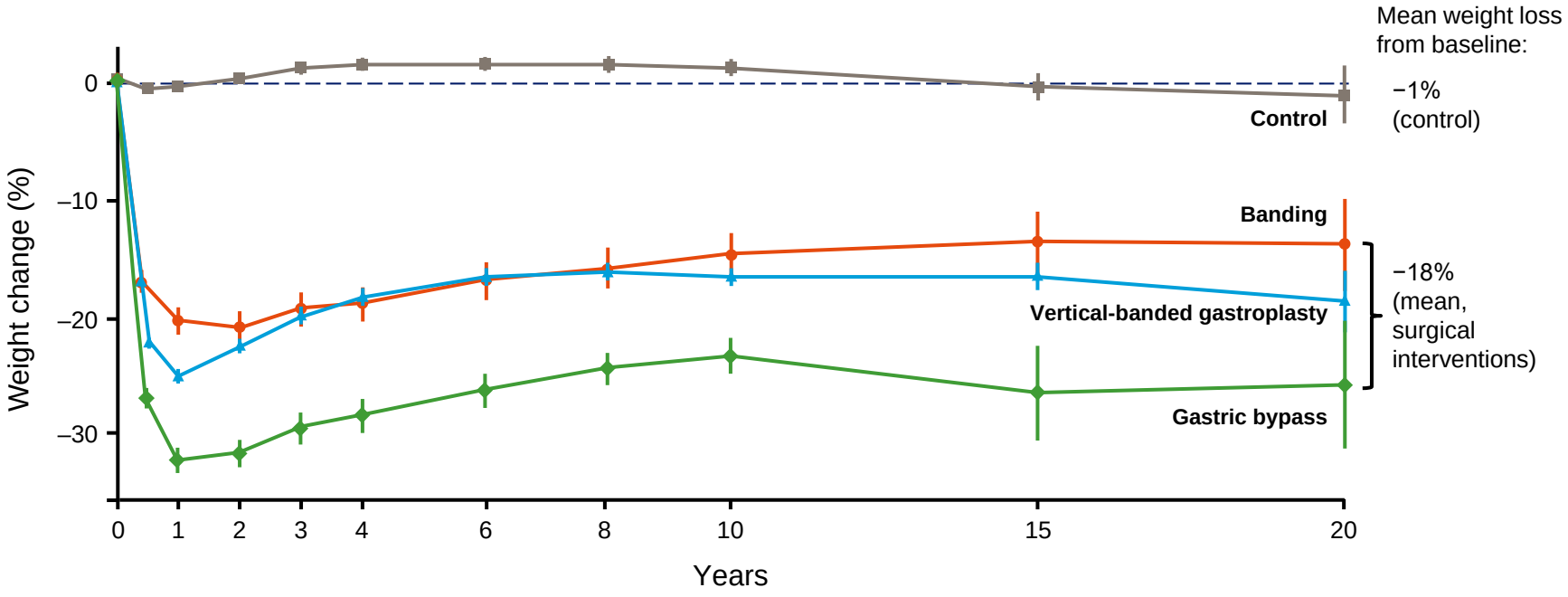


Shift in the Bariatric Surgery Procedures Done in the U.S.

www. asmbs.org

	2011	2012	2013	2014	2015	2016	*2017*
Total	158,000	173,000	179,000	193,000	196,000	216,000	*228,000*
Sleeve	17.80%	33.00%	42.10%	51.70%	53.61%	58.11%	***59.39%***
RYGB	36.70%	37.50%	34.20%	26.80%	23.02%	18.69%	***17.80%***
Band	35.40%	20.20%	14.00%	9.50%	5.68%	3.39%	***2.77%***
BPD-DS	0.90%	1.00%	1.00%	0.40%	0.60%	0.57%	***0.70%***
Revision	6.00%	6.00%	6.00%	11.50%	13.55%	13.95%	***14.14%***
Other	3.20%	2.30%	2.70%	0.10%	3.19%	2.63%	***2.46%***
Balloons					0.36%	2.66%	***2.75%***

Does it work? Weight loss



Data are mean ±95% confidence interval
Sjöström L et al. *JAMA* 2012;307:56–65.

Bariatric surgery and metabolic outcomes

Figure 2. Eight-Year Cumulative Incidence Estimates (Kaplan-Meier) for 2 Composite End Points

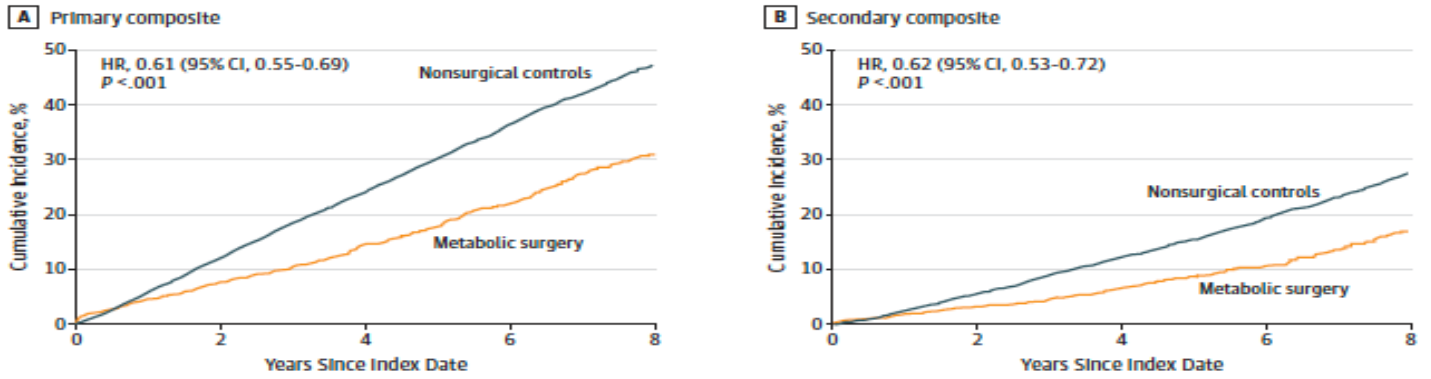
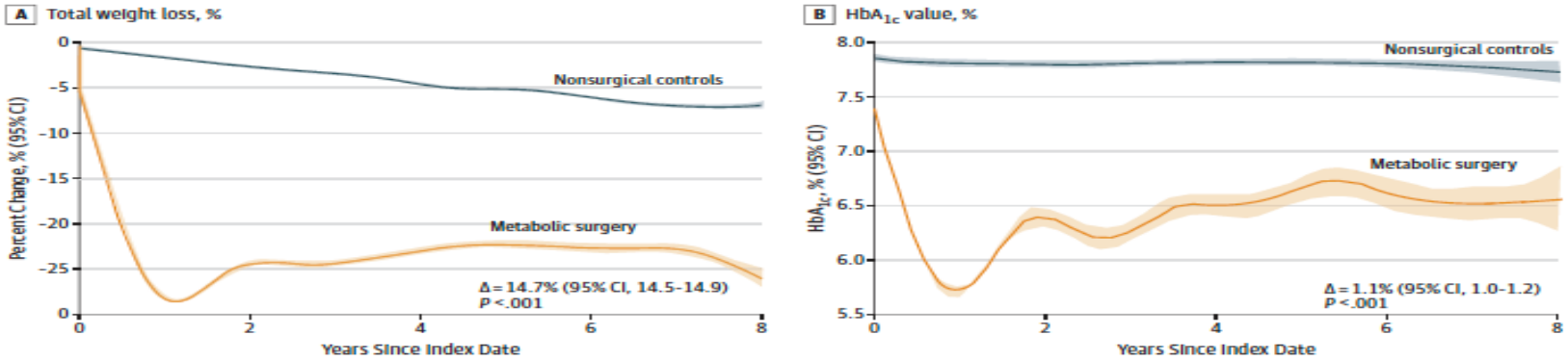


Figure 4. Mean Trend Curves of Weight Loss and HbA_{1c} Values Over 8 Years of Follow-up



Aminian A et al. *JAMA* 2019;doi: 10.1001/jama.2019.14231 [Epub ahead of print]; Adams TD et al. *N Engl J Med* 2017;377:1143–55.

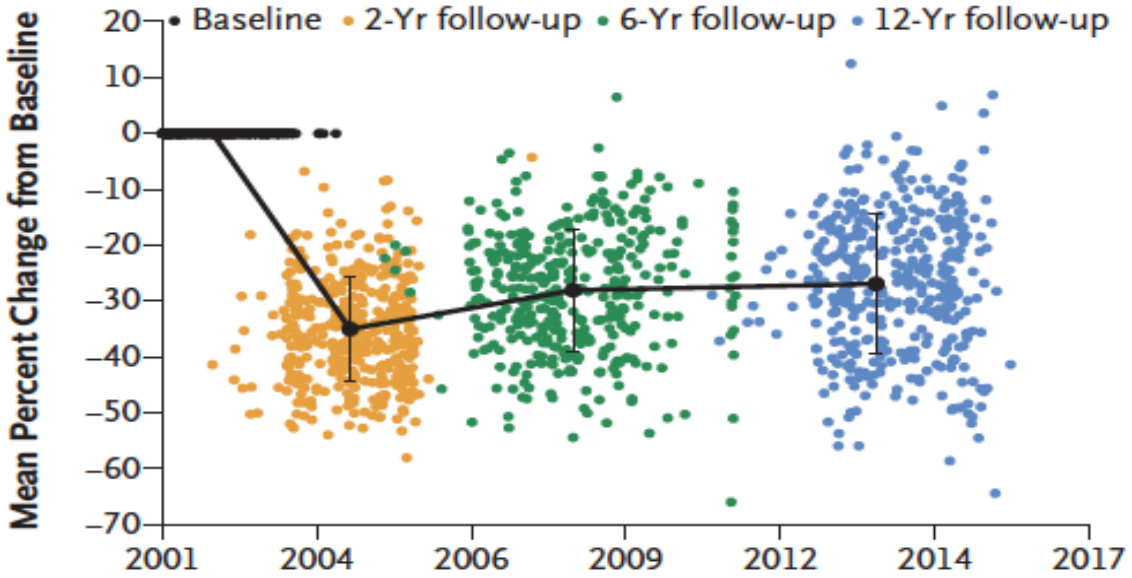
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Long-Term Mortality after Gastric Bypass Surgery

Ted D. Adams, Ph.D., M.P.H., Richard E. Gress, M.A., Sherman C. Smith, M.D., R. Chad Halverson, M.D., Steven C. Simper, M.D., Wayne D. Rosamond, Ph.D., Michael J. LaMonte, Ph.D., M.P.H., Antoinette M. Stroup, Ph.D., and Steven C. Hunt, Ph.D.

A Mean Percent Change in Body Weight from Baseline to Years 2, 6, and 12 in the Surgery Group



Cancer	0.56 (0.25–0.97)	<0.001	0.40 (0.25–0.63)	<0.001
Other diseases	0.65 (0.48–0.87)	0.005	0.56 (0.39–0.81)	0.002
All nondisease causes	1.76 (1.19–2.58)	0.004	1.58 (1.02–2.45)	0.04
Accident unrelated to drugs	1.34 (0.72–2.49)	0.36	1.22 (0.62–2.38)	0.56
Poisoning of undetermined intent	3.80 (1.29–12.0)	0.02	1.82 (0.51–6.54)	0.36
Suicide	1.71 (0.69–4.25)	0.25	2.03 (0.66–6.27)	0.22
Other nondisease cause	1.64 (0.82–3.28)	0.16	1.69 (0.75–3.82)	0.21

Original Article

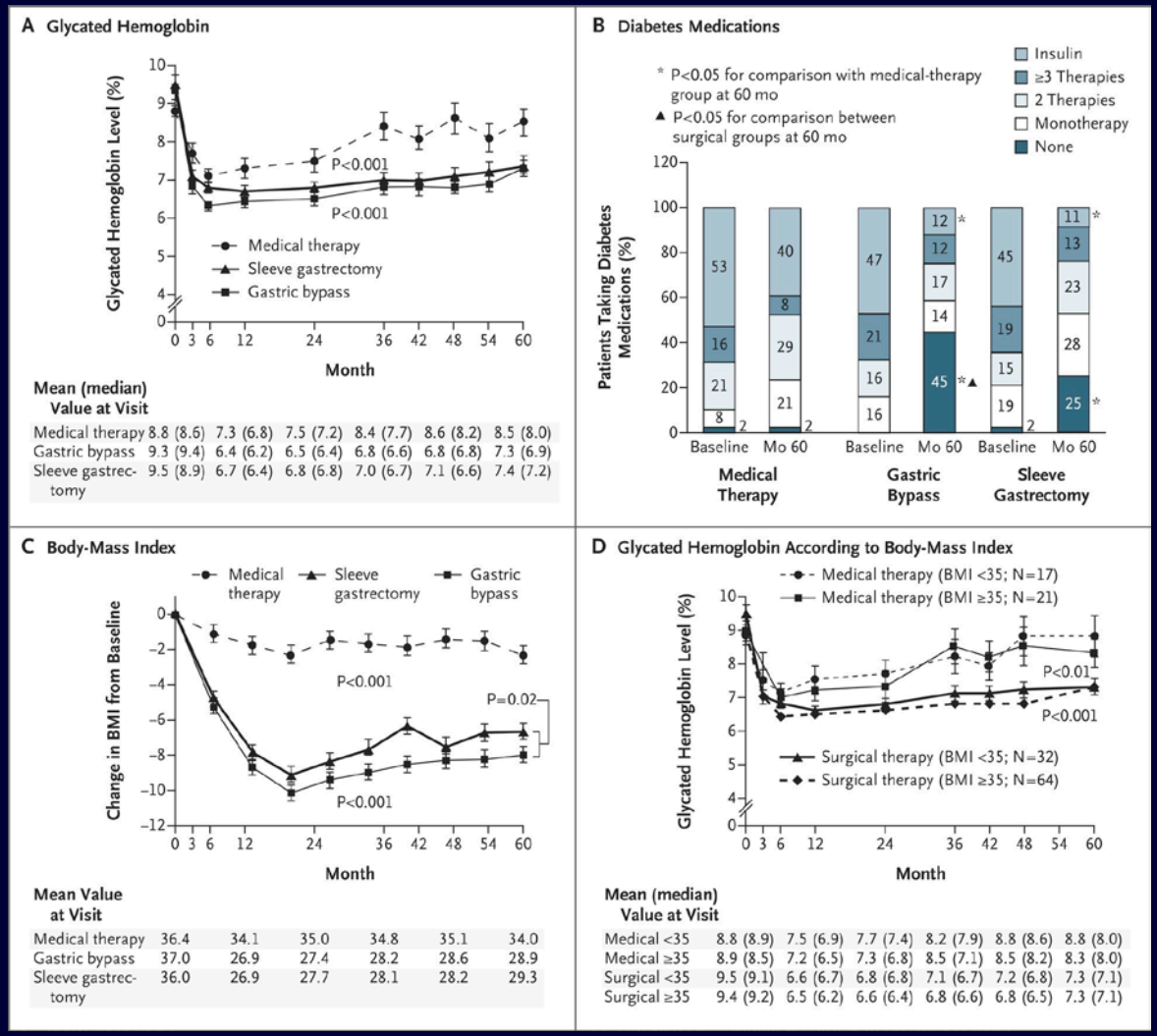
Bariatric Surgery versus Intensive Medical Therapy for Diabetes — 5-Year Outcomes

Philip R. Schauer, M.D., Deepak L. Bhatt, M.D., M.P.H., John P. Kirwan, Ph.D., Kathy Wolski, M.P.H., Ali Aminian, M.D., Stacy A. Brethauer, M.D., Sankar D. Navaneethan, M.D., M.P.H., Rishi P. Singh, M.D., Claire E. Pothier, M.P.H., Steven E. Nissen, M.D., Sangeeta R. Kashyap, M.D., for the STAMPEDE Investigators

N Engl J Med
Volume 376(7):641-651
February 16, 2017

The NEW ENGLAND JOURNAL of MEDICINE

Mean Changes in Measures of Diabetes Control from Baseline to 5 Years.



Mean (median) Value at Visit

Medical therapy	8.8 (8.6)	7.3 (6.8)	7.5 (7.2)	8.4 (7.7)	8.6 (8.2)	8.5 (8.0)
Gastric bypass	9.3 (9.4)	6.4 (6.2)	6.5 (6.4)	6.8 (6.6)	6.8 (6.8)	7.3 (6.9)
Sleeve gastrectomy	9.5 (8.9)	6.7 (6.4)	6.8 (6.8)	7.0 (6.7)	7.1 (6.6)	7.4 (7.2)

Mean Value at Visit

Medical therapy	36.4	34.1	35.0	34.8	35.1	34.0
Gastric bypass	37.0	26.9	27.4	28.2	28.6	28.9
Sleeve gastrectomy	36.0	26.9	27.7	28.1	28.2	29.3

Mean (median) Value at Visit

Medical <35	8.8 (8.9)	7.5 (6.9)	7.7 (7.4)	8.2 (7.9)	8.8 (8.6)	8.8 (8.0)
Medical ≥35	8.9 (8.5)	7.2 (6.5)	7.3 (6.8)	8.5 (7.1)	8.5 (8.2)	8.3 (8.0)
Surgical <35	9.5 (9.1)	6.6 (6.7)	6.8 (6.8)	7.1 (6.7)	7.2 (6.8)	7.3 (7.1)
Surgical ≥35	9.4 (9.2)	6.5 (6.2)	6.6 (6.4)	6.8 (6.6)	6.8 (6.5)	7.3 (7.1)

Schauer PR et al. N Engl J Med 2017;376:641-651

The NEW ENGLAND JOURNAL of MEDICINE

Metabolic Surgery in the Treatment Algorithm for Type 2 Diabetes: A Joint Statement by International Diabetes Organizations

Diabetes Care 2016;39:861–877 | DOI: 10.2337/dc16-0236

Executive Summary

T2D is associated with complex metabolic dysfunctions, leading to increased morbidity, mortality, and cost. Although population-based efforts through lifestyle interventions are essential to prevent obesity and diabetes, people who develop this disease should have access to all effective treatment options.

Given its role in metabolic regulation, the GI tract constitutes a clinically and biologically meaningful target for the management of T2D.

A substantial body of evidence has accumulated, including numerous, albeit mostly short/midterm RCTs, demonstrating that metabolic surgery—defined here as the use of GI surgery with the intent to treat T2D and obesity—can achieve excellent control of hyperglycemia and reduce cardiovascular risk factors.

Although additional studies are needed to further demonstrate long-term benefits, there is now sufficient clinical and mechanistic evidence to support inclusion of metabolic surgery among antidiabetes interventions for people with T2D and obesity.

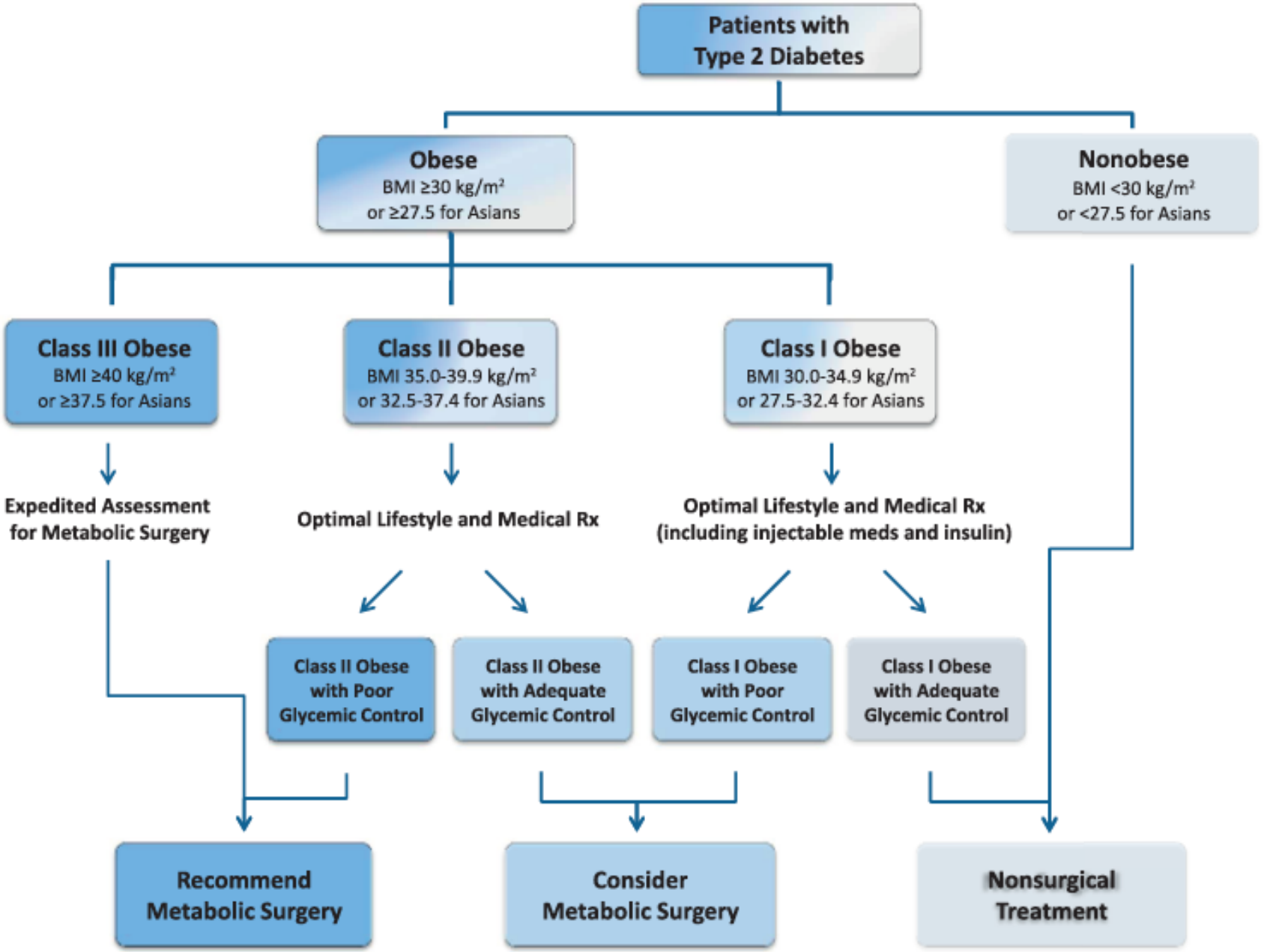
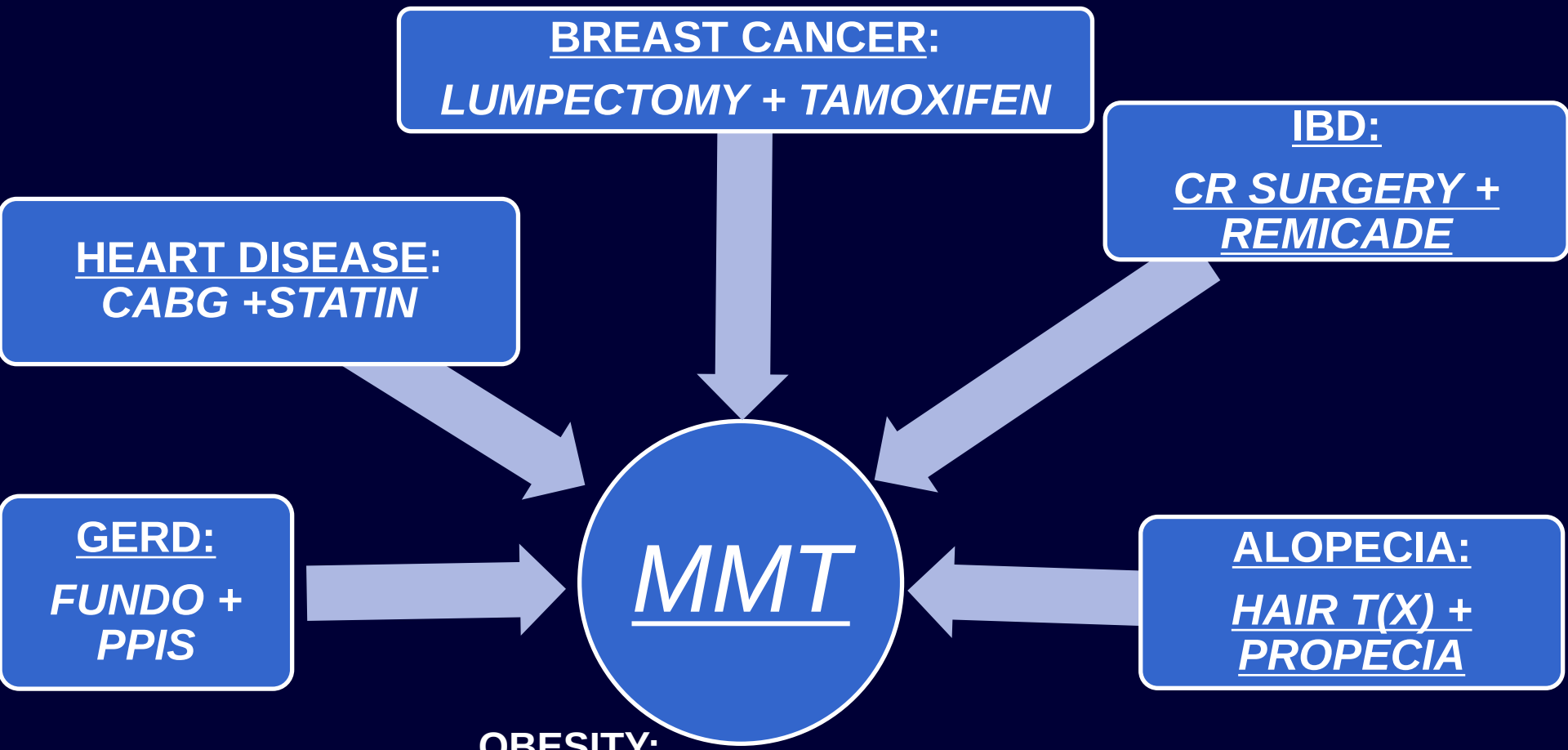
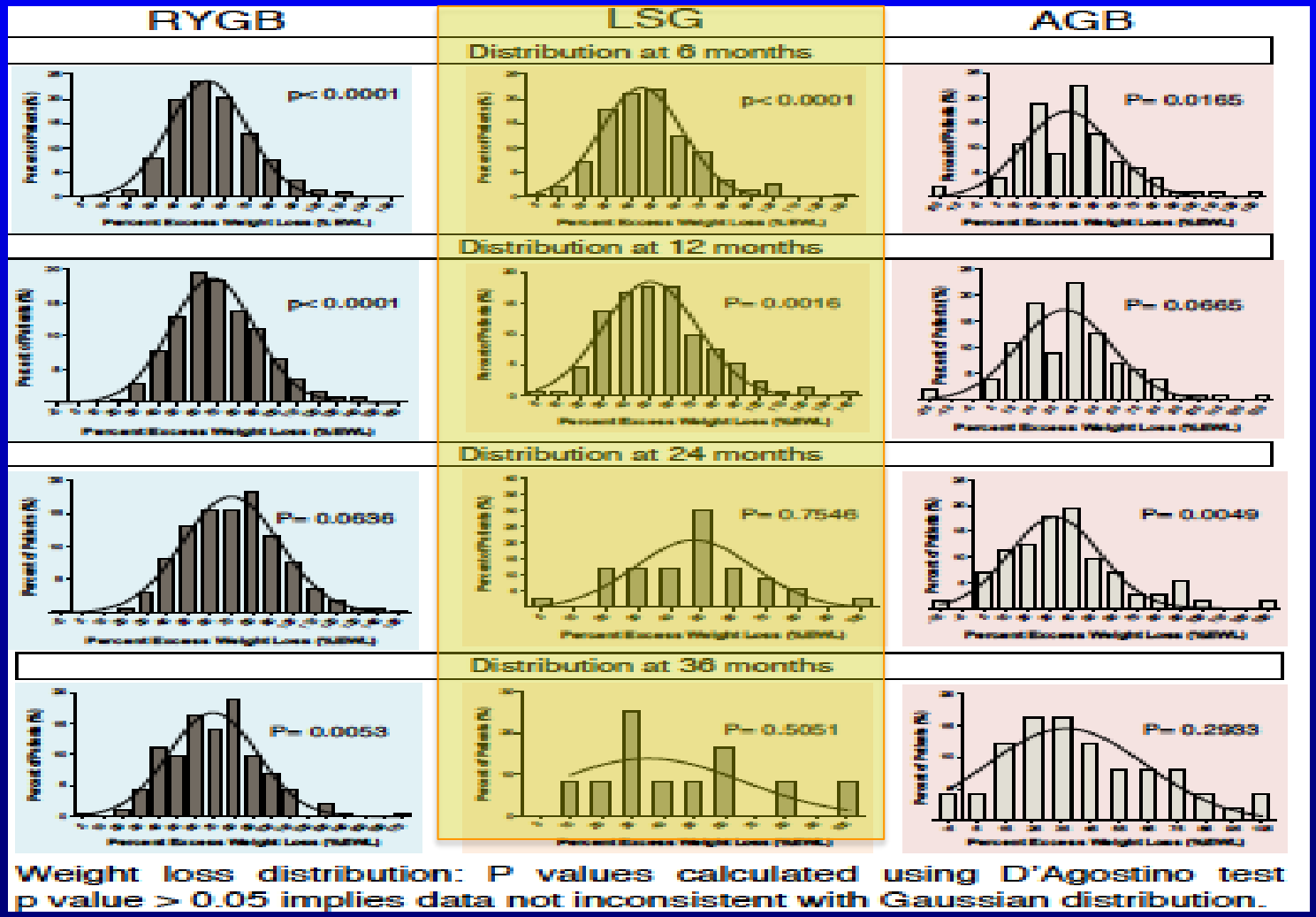


Figure 4—Algorithm for the treatment of T2D, as recommended by DSS-II voting delegates. The indications above are intended for patients who are appropriate candidates for elective surgery. meds, medications.

MMT
MULTI-MODALITY THERAPY



Heterogenity of Weight Loss Morton, Surgery 2018



Weight loss distribution: P values calculated using D'Agostino test p value > 0.05 implies data not inconsistent with Gaussian distribution.

JAMA Surgery | Original Investigation

Factors Associated With Achieving a Body Mass Index of Less Than 30 After Bariatric Surgery

CONCLUSIONS AND RELEVANCE Patients with a preoperative BMI of less than 40 are more likely to achieve a BMI of less than 30 after bariatric surgery and are more likely to experience comorbidity remission. Policies and practice patterns that delay bariatric surgery until the BMI is 50 or greater can result in significantly inferior outcomes.

DOWNSTAGING THE DISEASE

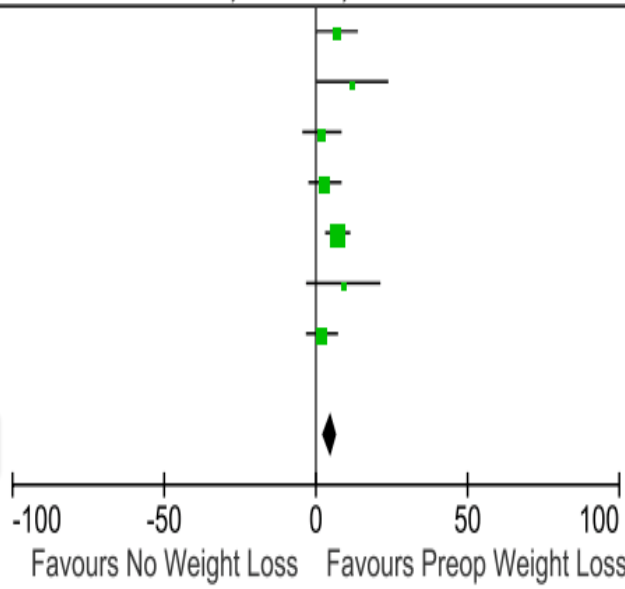
JAMA Surgery November 2017 Volume 152, Number 11

Meta-Analytic Results of Preoperative Weight Loss on 12-Month %EWL

Study or Subgroup	Preop Weight Loss Mean	SD	Total	No Preop Weight Loss Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Ali 2007	84	15	23	77	15	91	11.5%	7.00 [0.14, 13.86]
Carlin 2008	65	14	20	53	9	3	3.8%	12.00 [0.11, 23.89]
Carlin 2008	73	15	120	71	17	32	12.9%	2.00 [-4.47, 8.47]
Carlin 2008	67	11	94	64	13	26	18.0%	3.00 [-2.47, 8.47]
Harnisch 2008	67.2	15	88	60	15	115	31.1%	7.20 [3.04, 11.36]
Mrad 2008	38	15	12	29	15	11	3.6%	9.00 [-3.27, 21.27]
Mrad 2008	36	15	61	34	15	62	19.2%	2.00 [-3.30, 7.30]
Total (95% CI)			418			340	100.0%	5.00 [2.68, 7.32]

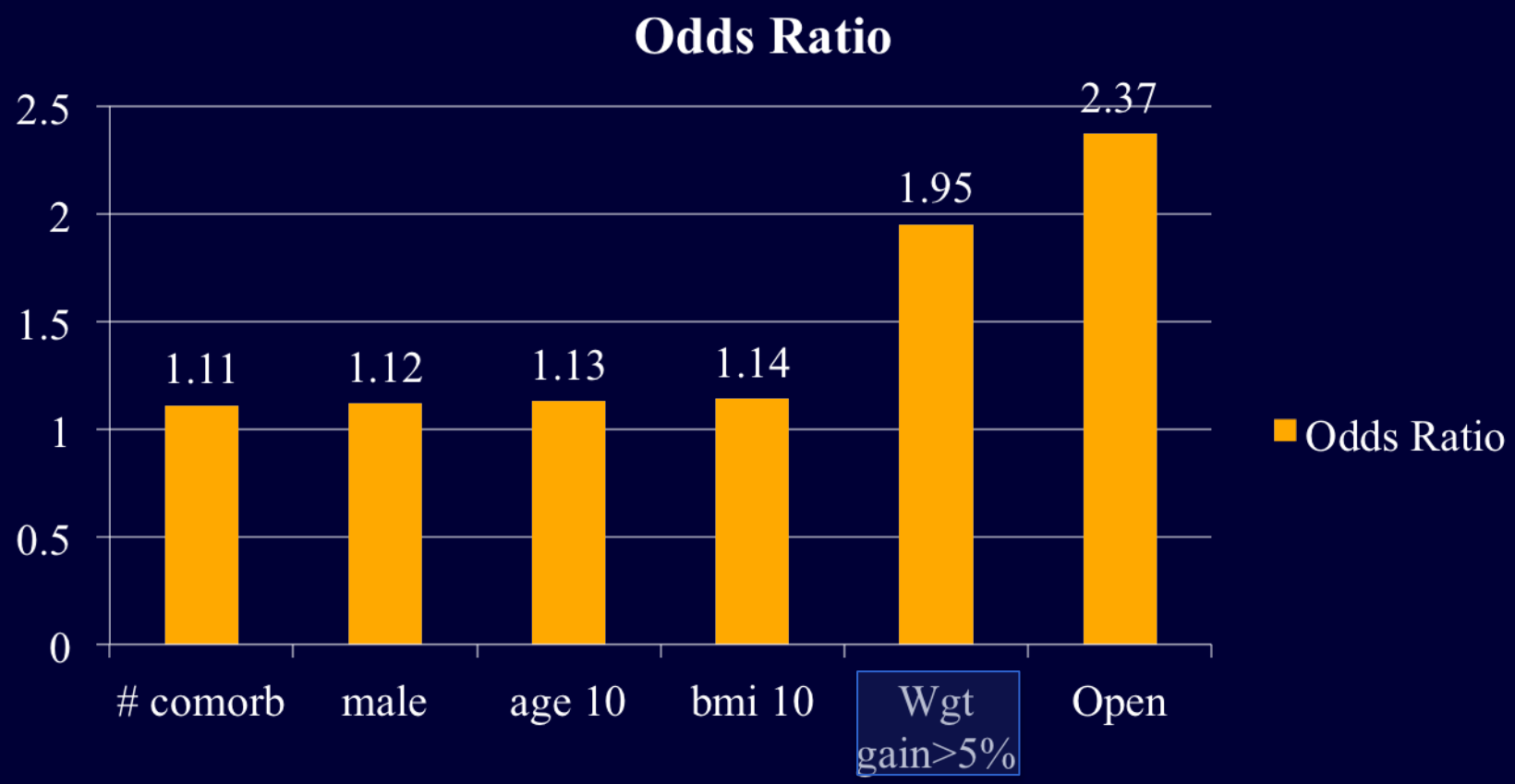
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 5.71$, df = 6 (P = 0.46); $I^2 = 0\%$

Test for overall effect: Z = 4.22 (P < 0.0001)

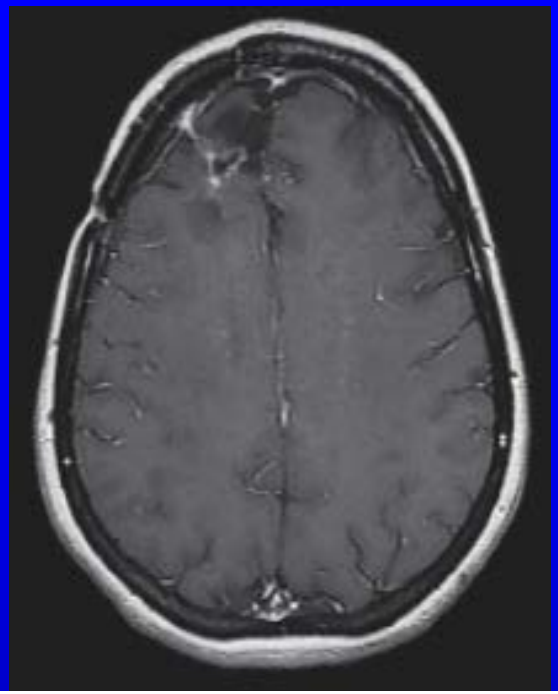


Source: Livhits, M., Mercado, C., Yermilov, I., Parikh, J. A., Dutson, E., Mehran, A., ... & Gibbons, M. M. (2009). Does weight loss immediately before bariatric surgery improve outcomes: a systematic review. Surgery for Obesity and Related Diseases, 5(6), 713-721.

Risk Factors for Complications



Arch Surg. 2009 December ; 144(12): 1150–1155. doi:10.1001/archsurg.2009.209.



- ADJUVANT CHEMOTHERAPY
- SAFEGUARD RESULTS

novo nordisk®

company announcement

Saxenda® for the treatment of obesity receives positive 14-1 vote in favour of approval from FDA Advisory Committee

Bagsværd, Denmark, 11 September 2014 – Novo Nordisk today announced that the Endocrinologic and Metabolic Drugs Advisory Committee (EMDAC) of the United States Food and Drug Administration (FDA) has completed its meeting regarding the New Drug Application (NDA) for Saxenda®, the intended brand name for liraglutide 3 mg, a once-daily human GLP-1 analogue for the treatment of obesity.

Lomaira Control *p<0.01

DRUG VS PLACEBO:
4% VS 39% GAINED WGT
44 VS 11% LOST 5% TBW

Figure 1: Percent Excess Weight Loss

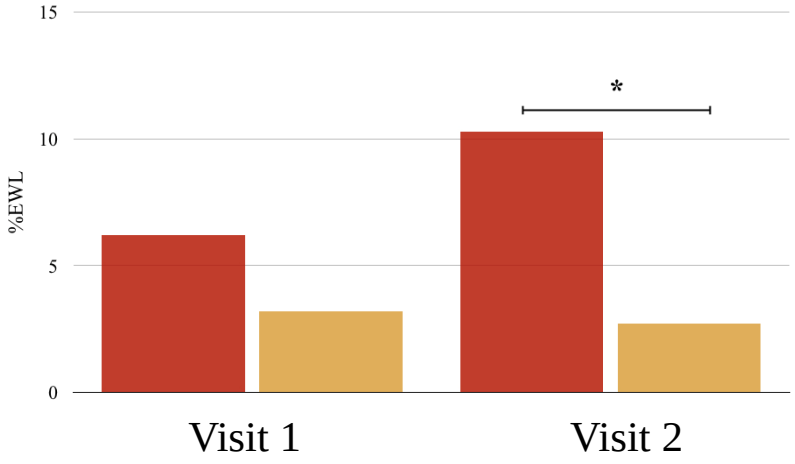


Figure 2: Percent Total Body Weight Loss

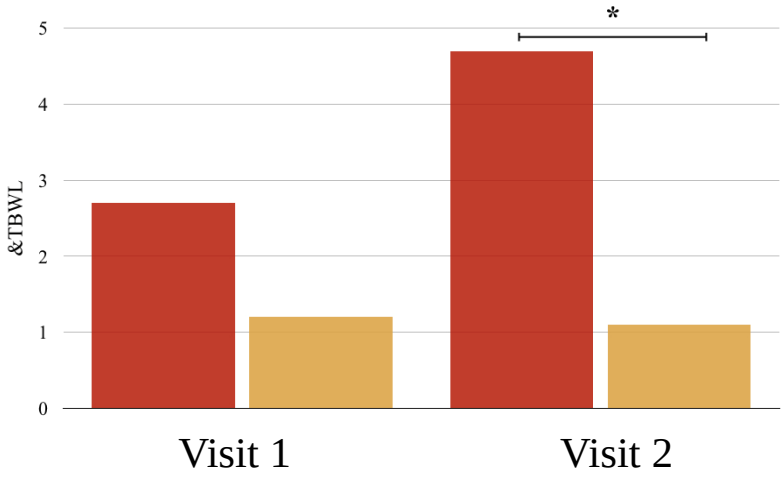


Figure 3: Absolute Pounds Lost

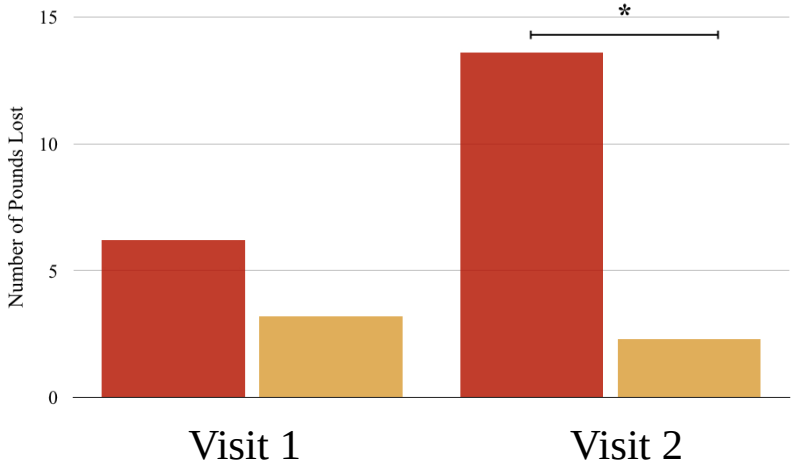
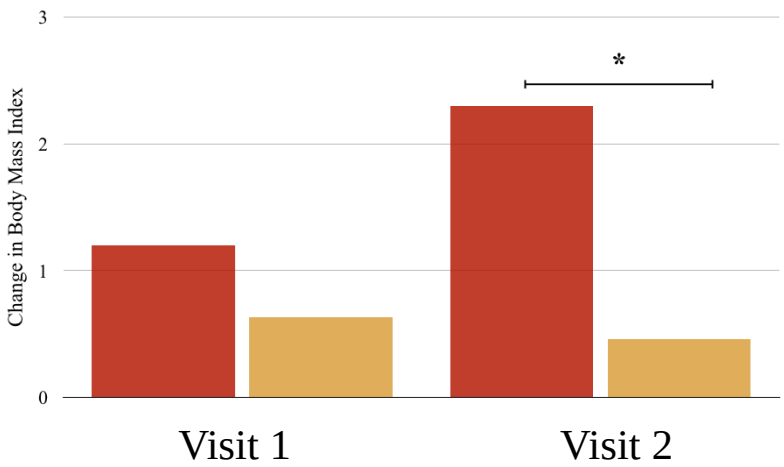
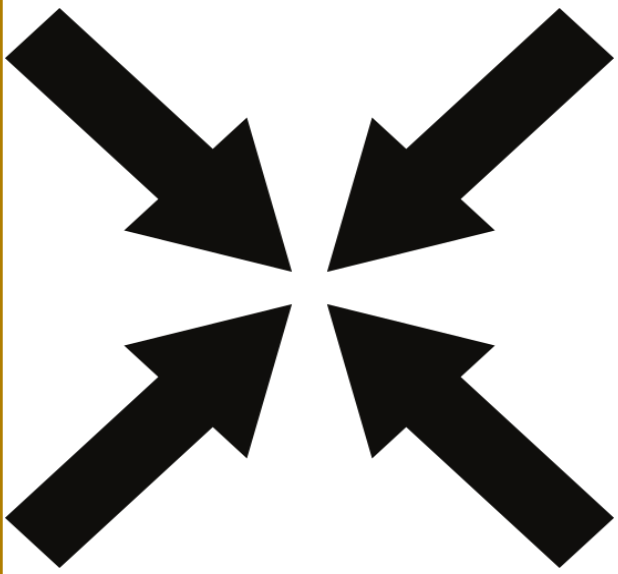


Figure 4: Absolute Change in Body Mass Index



MAKING THE CASE: PERIOPERATIVE USE OF ANTI-OBESITY MEDICATIONS WITH BARIATRIC SURGERY

SHRINK



DECREASE PREOP WEIGHT

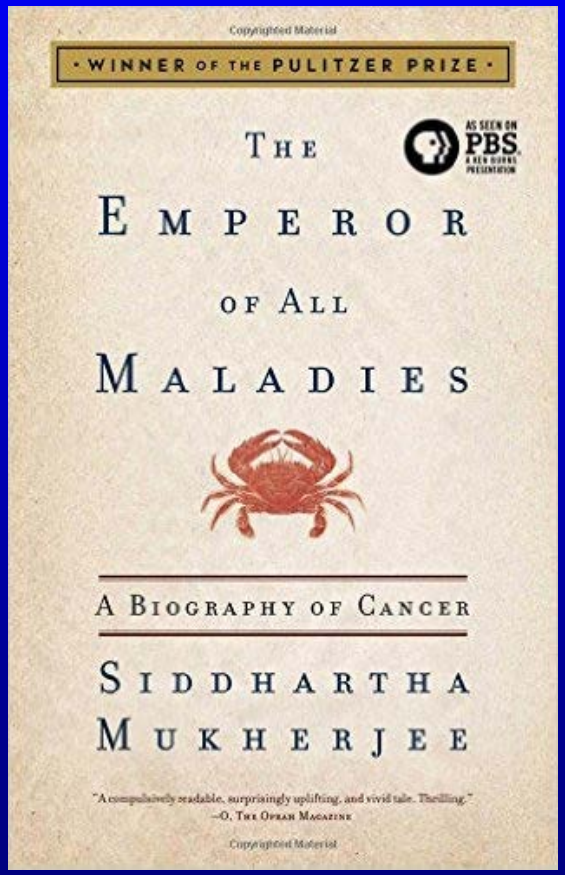
REDUCE

LOWER COMPLICATIONS & RESOURCE USE

MAINTAIN

SAFEGUARD RESULTS

TOWARDS A MORE PERFECT UNION
Metabolic Centers

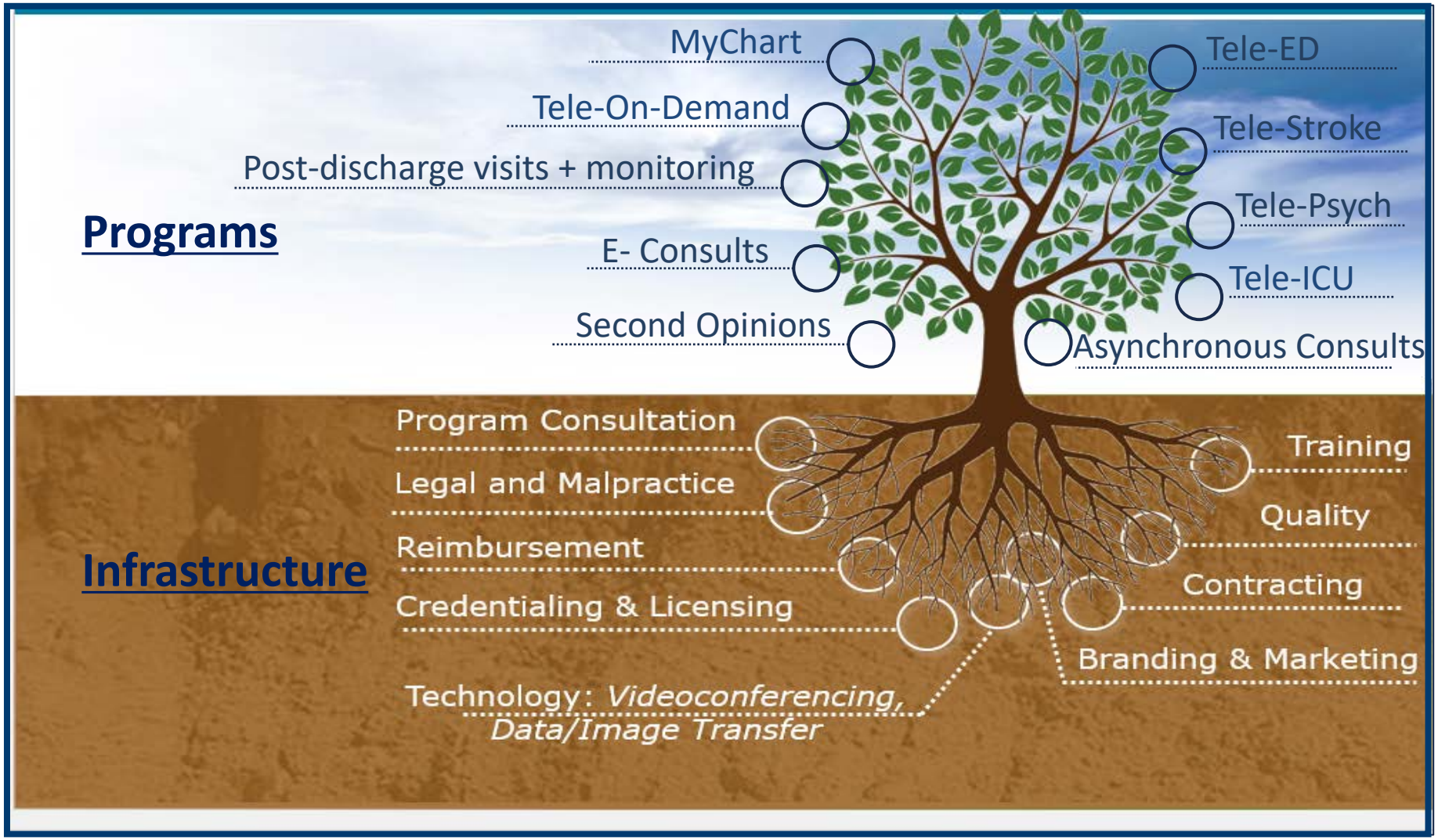


Telehealth Advancement

Growing Comprehensive Telehealth Services

Yale Medicine | Yale NewHaven Health

Telehealth has been organized as a unified structure between YM and YNHHS, with dedicated leadership and support team members to launch and foster the components outlined below. With the approval of the Telehealth Business Plan and the significant adoption from both inpatient and ambulatory clinicians, COVID19 recruitment is underway to right-size the team.



YNHH Volume Comparison

January to August 2020

THE WALL STREET JOURNAL.

BUSINESS | HEALTH CARE | HEALTH

Patients Seek Surgery to Combat Major Covid-19 Risk Factor: Obesity

Medical procedures that spur weight loss are on the rise, as research suggests obese Covid-19 patients face heightened risk of severe outcomes

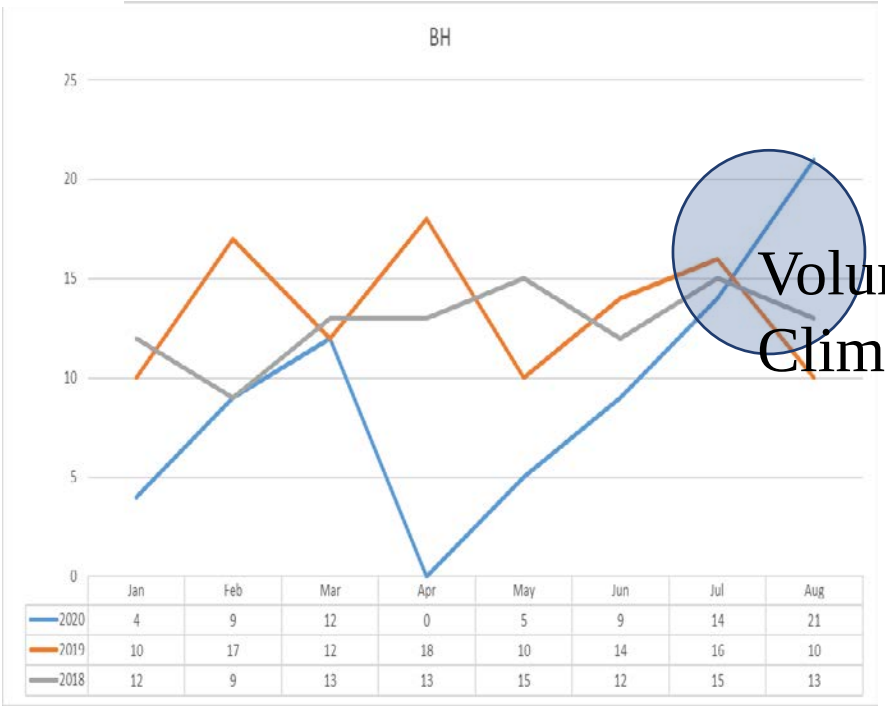
Scientists think Covid-19 is particularly dangerous to obese people in part because the coronavirus enters the body through the ACE2 receptor, an enzyme found both in cells that line the lungs and in fat tissue, making patients carrying extra body weight more vulnerable to a high viral load. Obesity also is associated with shortness of breath and hyperinflammation, both of which make it harder for the body to fight off viral infection.

"The virus frankly has an easier job" replicating itself in obese patients, said John Morton, head of the bariatric practice at Yale Medical Center in New Haven, Conn. "It has more targets."

Bariatric surgery volume rose about 20% once Yale's five hospitals reopened to elective surgeries in June, compared with a year earlier, Dr. Morton said, and the momentum has continued through summer. Clinical inquiries about the surgery are also on the rise, he said.

"Some of the hip and knee stuff has not kept up, orthopedics has been slower, same thing with spine surgeries," Dr. Morton said. "The only two surgeries that have been Covid-proof have been cancer and bariatric."

UnitedHealth Group's Optum health-care arm, which owns surgery centers and medical practices across the country, says it saw a 26% annual increase in patients enrolling in bariatric-surgery programs during the summer. Insurer Cigna Corp. says that prior authorizations for bariatric procedures, which fell 38.3% annually from March to May, rose 9.3% annually in June, July and August.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
2020	4	9	12	0	5	9	14	21
2019	10	17	12	18	10	14	16	10
2018	12	9	13	13	15	12	15	13

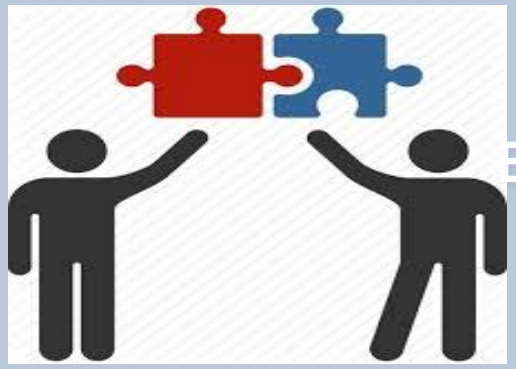
Yale NewHaven Health

Yale Obesity Initiative

Direct Patient Care

Full Continuum of Care
Counseling, Medications, Endoscopy and Surgery

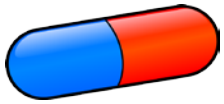
Collaboration

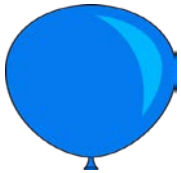


NETWORK OF CARE-
RESEARCH, QUALITY, SUPPLY CHAIN

Healthy Hospitals

FIRST IN NATION





Partnership with Weight-Affected Specialties
Ortho, Cards, Onc, GI

Community Involvement
Healthy Food
Employee Wellness

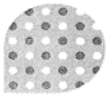
YALE

The Halo Effect of Gastric Bypass: Weight Loss in Family Members

Vital Signs | Anahad O'Connor

PATTERNS

Gastric Bypass Surgery's Ripple Effect



Gastric bypass surgery may have a ripple effect. Family members of patients nutrition.

A year after the surgery, the patients had lost an average of 100 pounds and went from body mass

THE NEW YORK TIMES, TUESDAY, OCTOBER 18, 2011

Weight loss after surgery seen in patient's family

Mon, Oct 17 2011

By Frederik Joelving

NEW YORK (Reuters Health) - People who have weight loss surgery aren't alone in slimming down after the procedure -- family members do so, too, a study in the Archives of Surgery shows.

HEALTH

Weight Loss After Surgery Seen in Patient's Family

Oct 18, 2011 7:26 AM EDT

People who have weight loss surgery aren't alone in slimming down after the procedure-family members do so, too, a study in the Archives of Surgery shows.

Surgeons at Stanford University School of Medicine found that one year after a person had undergone surgery, obese family members had shed an average of eight pounds, dropping from 234 to 226.

The Family that Eats Together, Stays Together

Yale
NewHaven
Health

Halo Effect

Yale
NewHaven
Health

Conclusion

A Continuum of Care for Chronic Disease is Needed

Thank You

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