

Metabolic Surgery

for obesity and related disease

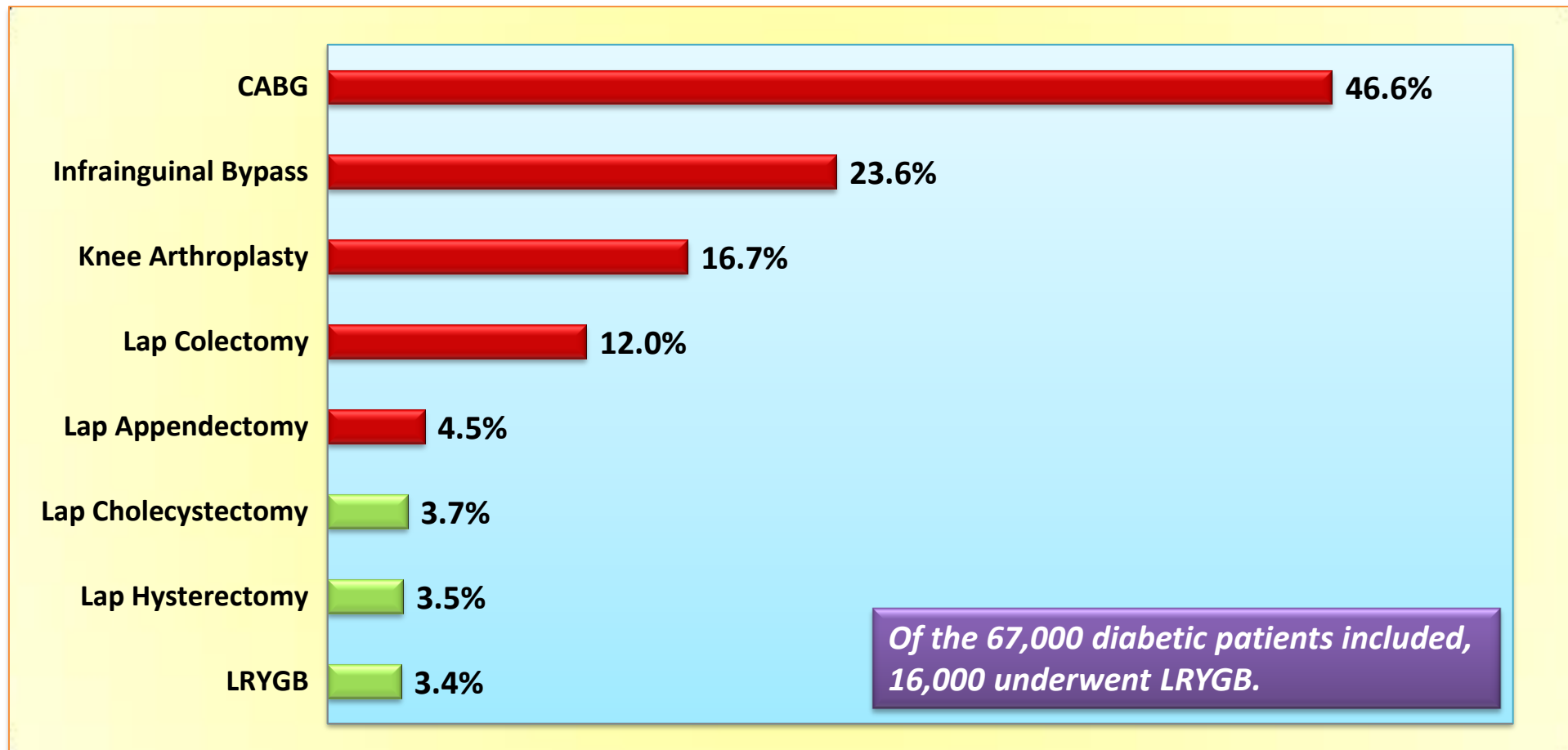
Dr Saeed Safari, M.D, M.I.S.F
Firoozgar General Hospital, IUMS
Dec 2019

- A brief history of **Metabolic vs. Bariatric** surgery
- Increasing yearly numbers in the world and Iran
- Estimates in Iran: 15000 surgeries per year

How safe is metabolic/diabetes surgery?

Aminian A¹, Brethauer SA, Kirwan JP, Kashyap SR, Burquera B, Schauer PR.

US National Data of Postoperative Composite Complication Rate (%) of 8 Procedures in Patients with Type 2 Diabetes



- ❖ **A 2-hour surgical procedure** requiring a **two-day hospital stay** that is associated with **low morbidity and mortality** can lead to remission of a chronic, progressive and disabling disease.
- ❖ Based on these findings, bariatric surgery can be considered a relatively safe option for managing T2DM in patients with mild obesity.

RCTs of Surgery vs Medical Rx for T2DM

Metabolic surgery for type 2 diabetes mellitus: Randomized controlled clinical trials

Study	Pts with BMI < 35 kg/m ²	Study design	No. pts	Follow-up (mo)	Remission criteria	Remission ^a or change in HbA1c (%)	P value
Dixon ²⁸	22%	LAGB vs control	60	24	HbA1c < 6.2%	73 vs 13	< .001
Schauer ^{29,30,43}	36%	RYGB vs SG vs control	150	60	HbA1c ≤ 6.0%	22 vs 15 vs 0	< .05
Mingrone ^{31,32}	0%	RYGB vs BPD vs control	60	60	HbA1c ≤ 6.5%	42 vs 68 vs 0	.003
Ikramuddin ^{33,34}	59%	RYGB vs control	120	24	HbA1c < 6.0%	44 vs 9	< .001
Liang ³⁵	100%	RYGB vs control	101	12	HbA1c < 6.5%	90 vs 0 vs 0 ^b	< .0001
Halperin ³⁶	34%	RYGB vs control	38	12	HbA1c < 6.5%	58 vs 16	.03
Courcoulas ^{37,38}	43%	RYGB vs LAGB vs control	69	36	HbA1c < 6.5%	40 vs 29 vs 0	.004
Wentworth ³⁹	100%	LAGB vs control	51	24	FBG < 7.0 mmol/L	52 vs 8	.001
Parikh ⁴⁰	100%	RYGB/LAGB/SG vs control	57	6	HbA1c < 6.5%	65 vs 0	.0001
Ding ⁴¹	34%	LAGB vs control	45	12	HbA1c < 6.5%	33 vs 23 ^c	.46
Cummings ⁴²	25%	RYGB vs control	43	12	HbA1c < 6.0%	60 vs 5.9	.002
Shah ⁴⁴	85	RYGB vs control	80	24	HbA1c < 6.5%	60 vs 2.5	< .001

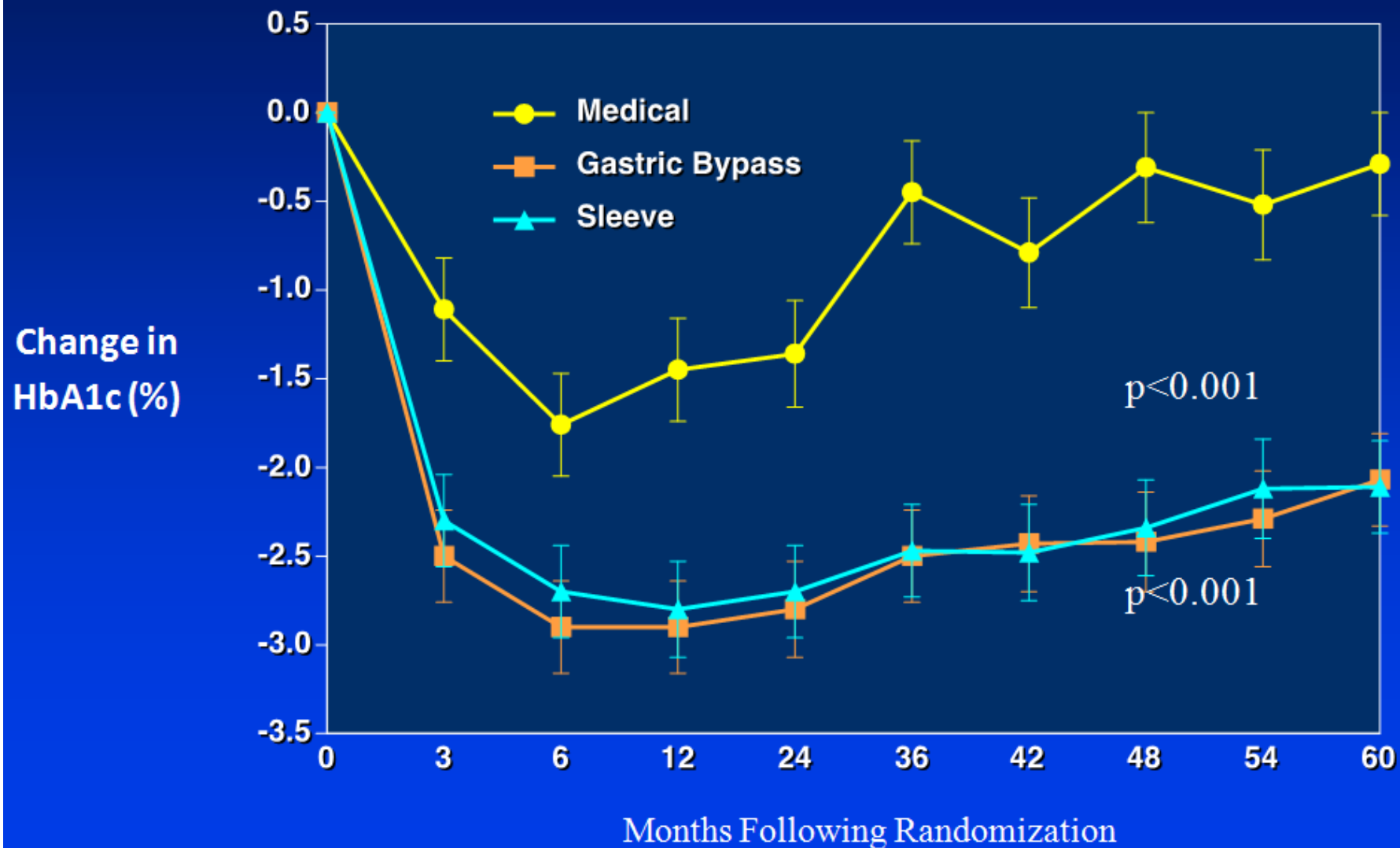
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

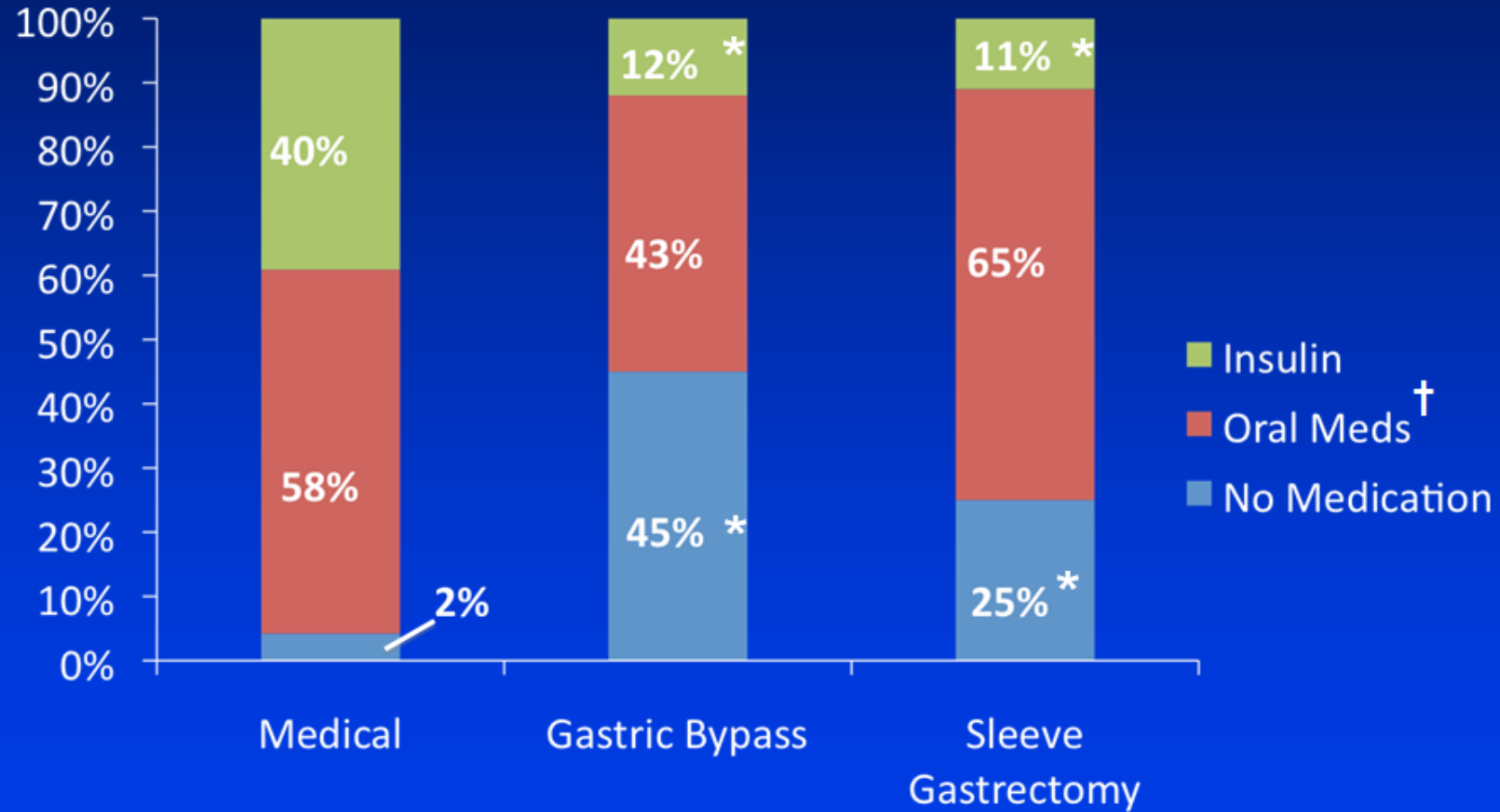
Bariatric Surgery versus Intensive Medical Therapy for Diabetes — 5-Year Outcomes

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., and Sangeeta R. Kashyap, M.D.,
for the STAMPEDE Investigators*

STAMPEDE: Change in HbA1c Over 5 Years



Diabetes Medications at 5 Years



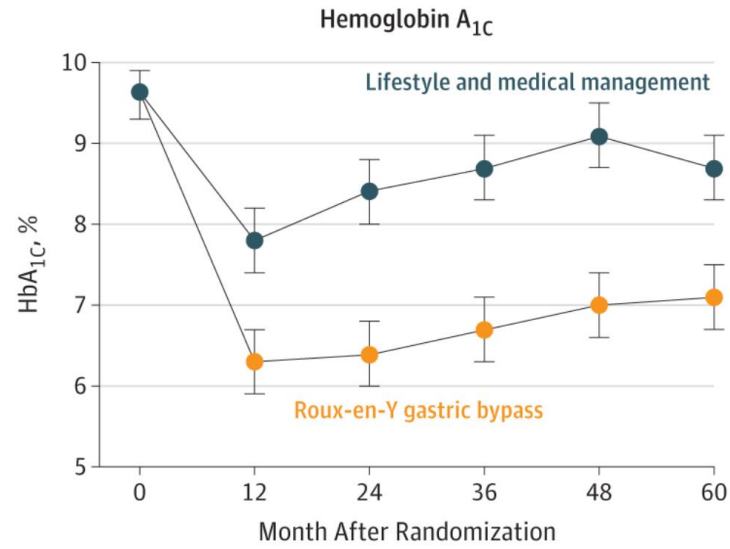
* P<0.05 compared to medical therapy

† Includes injectables such as GLP-1 agonists

JAMA | **Original Investigation**

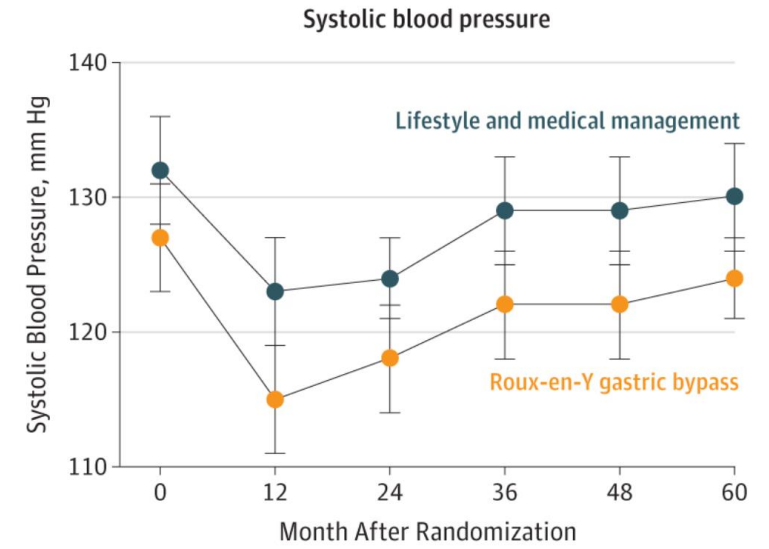
Lifestyle Intervention and Medical Management With vs Without Roux-en-Y Gastric Bypass and Control of Hemoglobin A_{1c}, LDL Cholesterol, and Systolic Blood Pressure at 5 Years in the Diabetes Surgery Study

Sayeed Ikramuddin, MD, MHA; Judith Korner, MD, PhD; Wei-Jei Lee, MD, PhD; Avis J. Thomas, MS;
John E. Connett, PhD; John P. Bantle, MD; Daniel B. Leslie, MD; Qi Wang, MS; William B. Inabnet III, MD;
Robert W. Jeffery, PhD; Keong Chong, MD; Lee-Ming Chuang, MD, PhD; Michael D. Jensen, MD; Adrian Vella, MD;
Leaque Ahmed, MD; Kumar Belani, MD; Charles J. Billington, MD



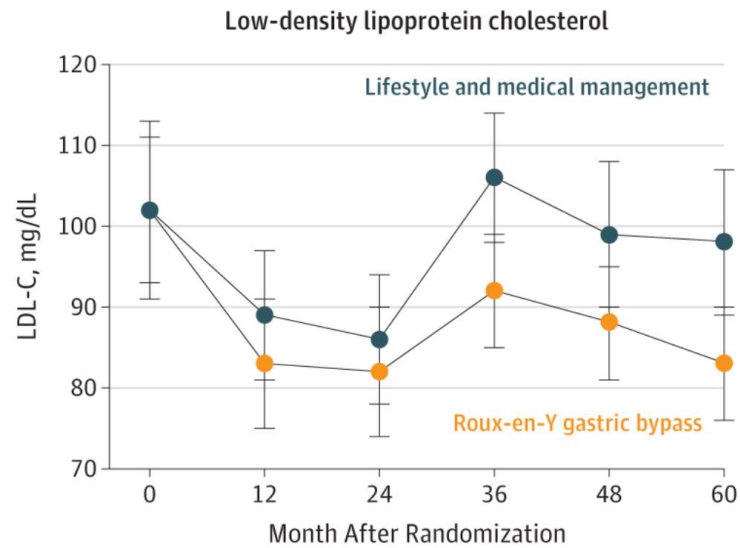
No. of patients

	0	12	24	36	48	60
Lifestyle and medical management	56	56	54	44	42	43
Roux-en-Y gastric bypass	57	57	56	55	54	55



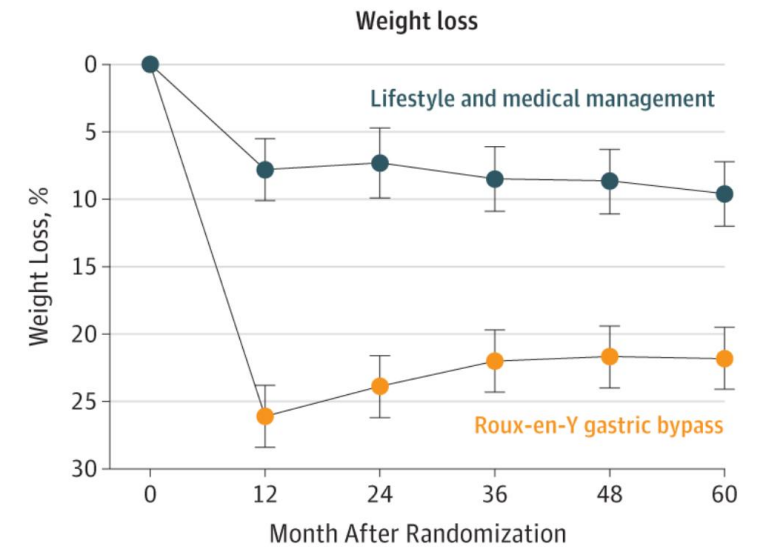
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[Surg Endosc.](#) 2019 May;33(5):1654-1660. doi: 10.1007/s00464-018-6458-8. Epub 2018 Sep 24.

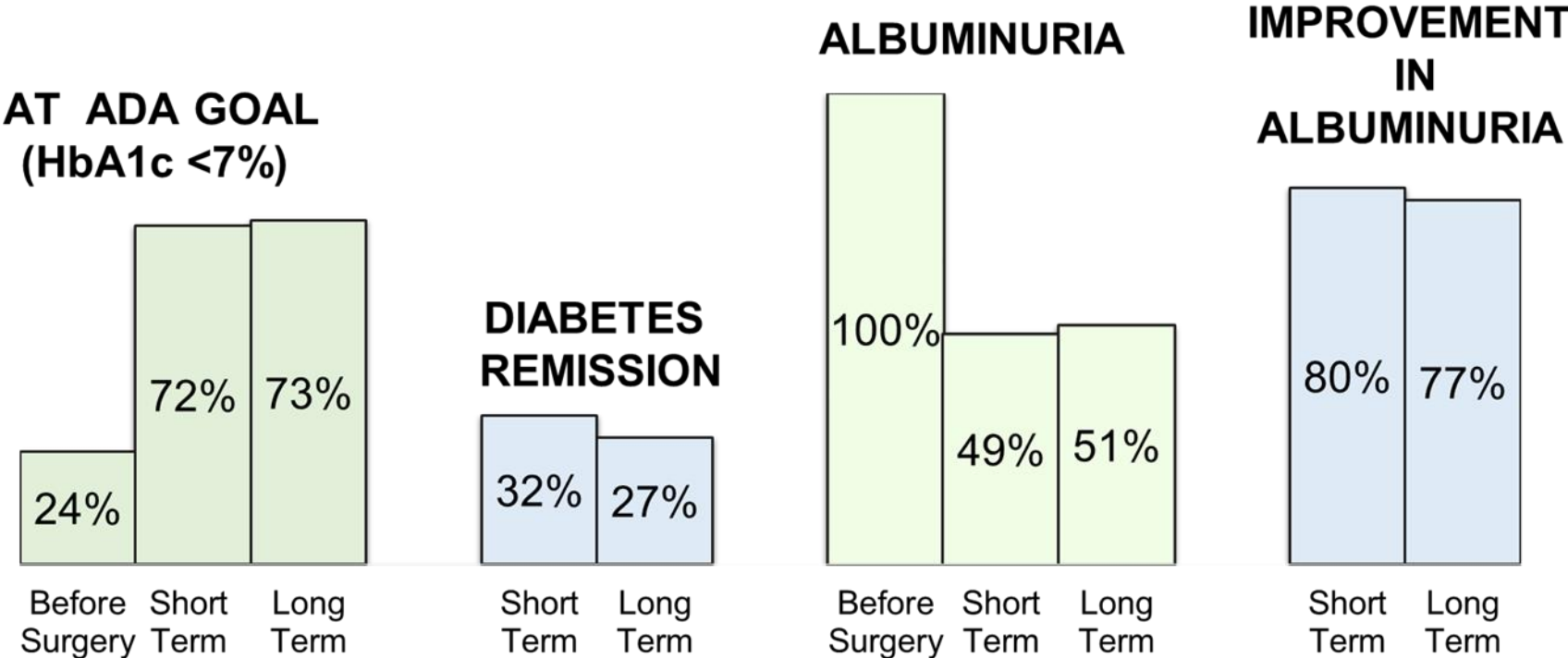
Long-term impact of bariatric surgery in diabetic nephropathy.

[Young L](#)¹, [Nor Hanipah Z](#)^{2,3}, [Brethauer SA](#)^{1,2}, [Schauer PR](#)^{1,2}, [Aminian A](#)^{4,5}

- 77% reduction in Albuminuria (short term)
- 51% reduction in Albuminuria (long term)

Impact of Bariatric Surgery in Diabetic Nephropathy

Whole Cohort (n=101)



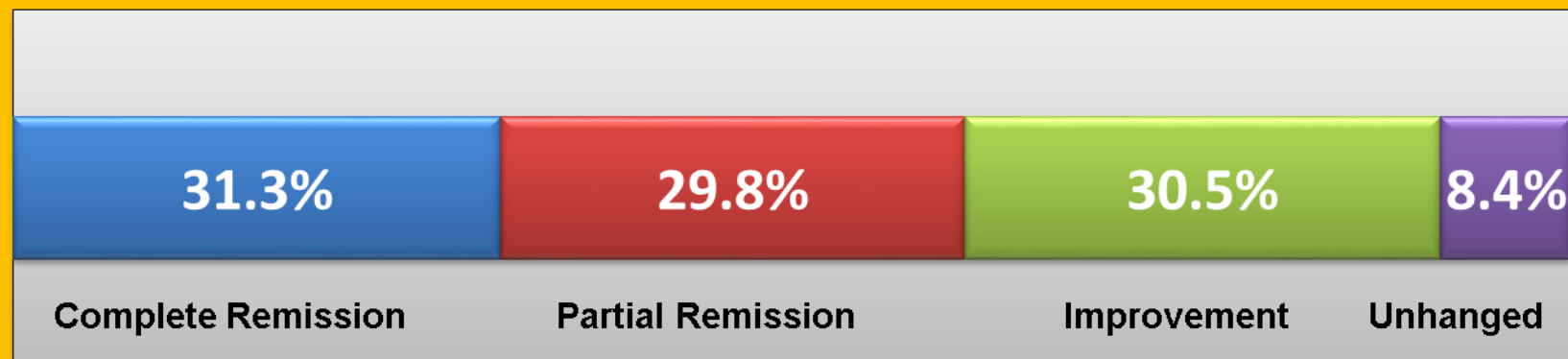
Original article

Risk prediction of complications of metabolic syndrome before and 6 years after gastric bypass

Ali Aminian, M.D.^a, Christopher R. Daigle, M.D.^a, Héctor Romero-Talamás, M.D.^a,
Sangeeta R. Kashyap, M.D.^b, John P. Kirwan, Ph.D.^b, Stacy A. Brethauer, M.D.^a,
Philip R. Schauer, M.D.^{a,*}

- **N=131, T2DM**
- **RYGB (2004-2007)**
- **F/U: median of 6 years (range, 5-9)**
- **% EWL 61±25%**

Long-term diabetes status after gastric bypass (n=131)



Predicted Risk of End Organ Complications

Metabolic Syndrome-Related Complications	Risk Assessment Tools	% Risk Reduction	P value
Overall risk of CHD, stroke, and PVD	Framingham (10-yr risk)	27	<0.001
Coronary Heart Disease	UKPDS (10-yr risk)	20	0.002
Myocardial Infarction	PROCAM (10-yr risk)	40	<0.001
Stroke	ARIC (10-yr risk)	42	0.001
Nephropathy	QKidney (5-yr risk)	45	<0.001
Retinopathy	Semeraro's nomogram (4-yr risk)	-	0.006
Intermittent Claudication	Framingham (4-yr risk)	47	<0.001
Cardiovascular Mortality	DECODE (5-yr risk)	18	0.048

Association of Metabolic Surgery With Major Adverse Cardiovascular Outcomes in Patients With Type 2 Diabetes and Obesity

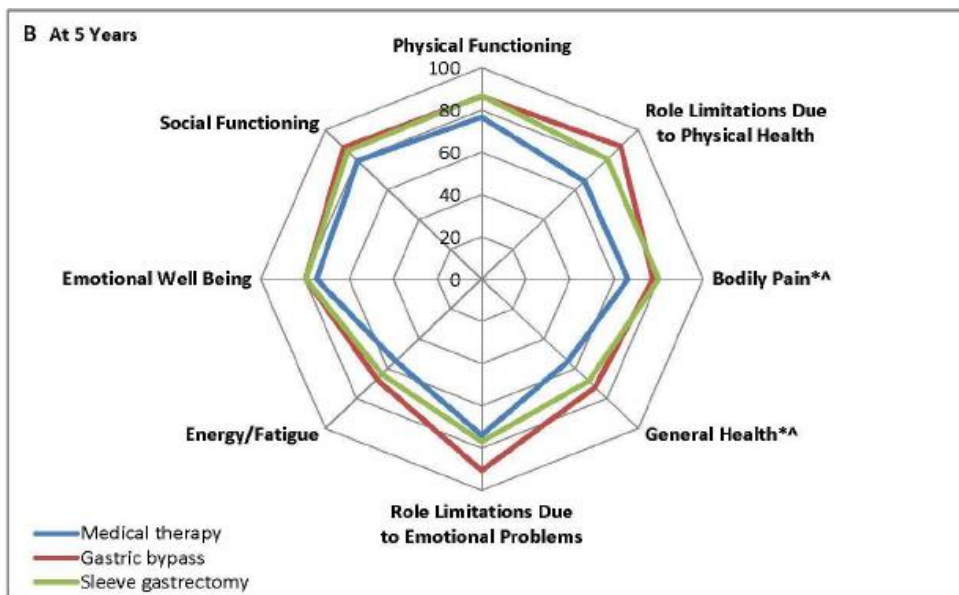
[Ali Aminian, MD¹](#); [Alexander Zajichek, MS²](#); [David E. Arterburn, MD, MPH³](#); [et al](#)

JAMA. 2019;322(13):1271-1282. doi:10.1001/jama.2019.14231

- NNT for prevention of a single death = **13**
- **41%** reduction in mortality
- **61%** reduction in heart failure
- **31%** reduction in heart attack
- **33%** reduction in stroke
- **60%** reduction in diabetic nephropathy
- **22%** reduction in AF

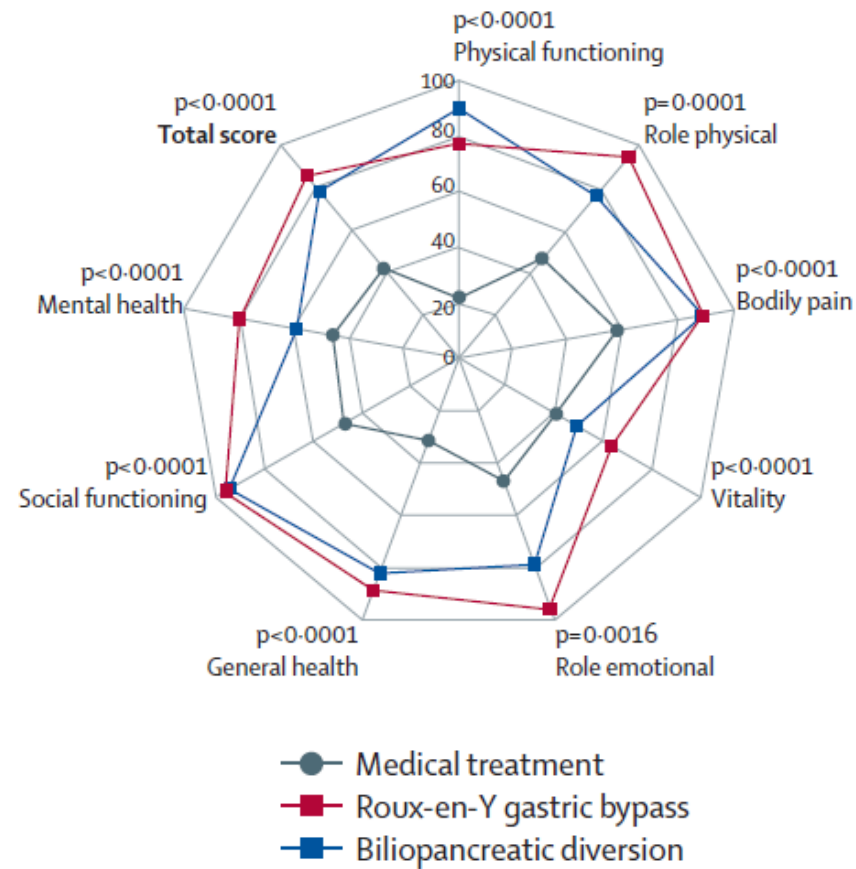
QUALITY OF LIFE

STAMPEDE



* $p < 0.05$ for change from baseline between gastric-bypass group and medical therapy group
^A $p < 0.05$ for change from baseline between sleeve-gastrectomy and medical therapy group

Mingrone/Rubino



Diabetes Care

WWW.DIABETES.ORG/DIABETESCARE

JANUARY 2018

 SUPPLEMENT
1

AMERICAN DIABETES ASSOCIATION

STANDARDS OF MEDICAL CARE IN DIABETES—2018

Download for Free at
WWW.DIABETES.ORG/DIABETESCARE

Recommendations

recommended for BMI > 40

appropriate surgical candidates with BMI ≥ 40 kg/m² (BMI ≥ 37.5 kg/m² in Asian Americans), regardless of the level of glycemic control or com-

recommended for BMI 35-39 if not well controlled with meds

or BMI 35-39 (BMI ≥ 37.5 kg/m² in Asian Americans) when hyperglycemia is inadequately controlled despite lifestyle and optimal medical therapy. **A**

- Metabolic surgery should be con-

should be considered for BMI 30-35
 If not well controlled with meds

cans) if hyperglycemia is inadequately controlled despite optimal medical control by either oral or injectable medications (including insulin). **B**

- Metabolic surgery should be per-

Should be performed in high volume
centers

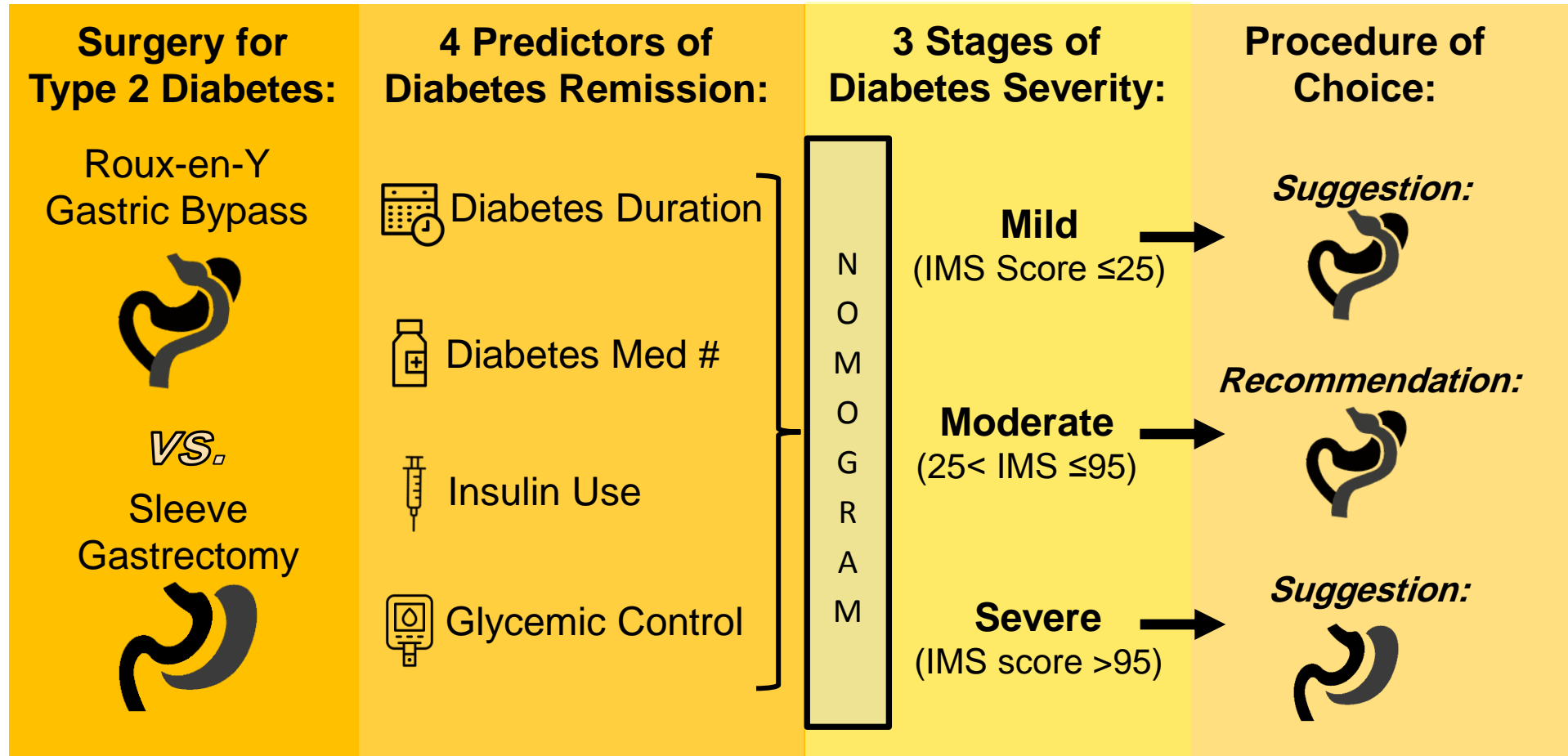
in the management of diabetes and gastrointestinal surgery. **C**

Procedure Selection for Diabetes

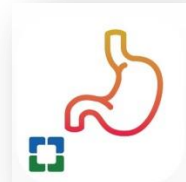
Efficacy & Risk Gradient

DS ≥ SADI > SAGB ≥ RYGB ≥ SG > AGB

Individualized Metabolic Surgery (IMS) Score: Bariatric Procedure Selection Based on Diabetes Severity



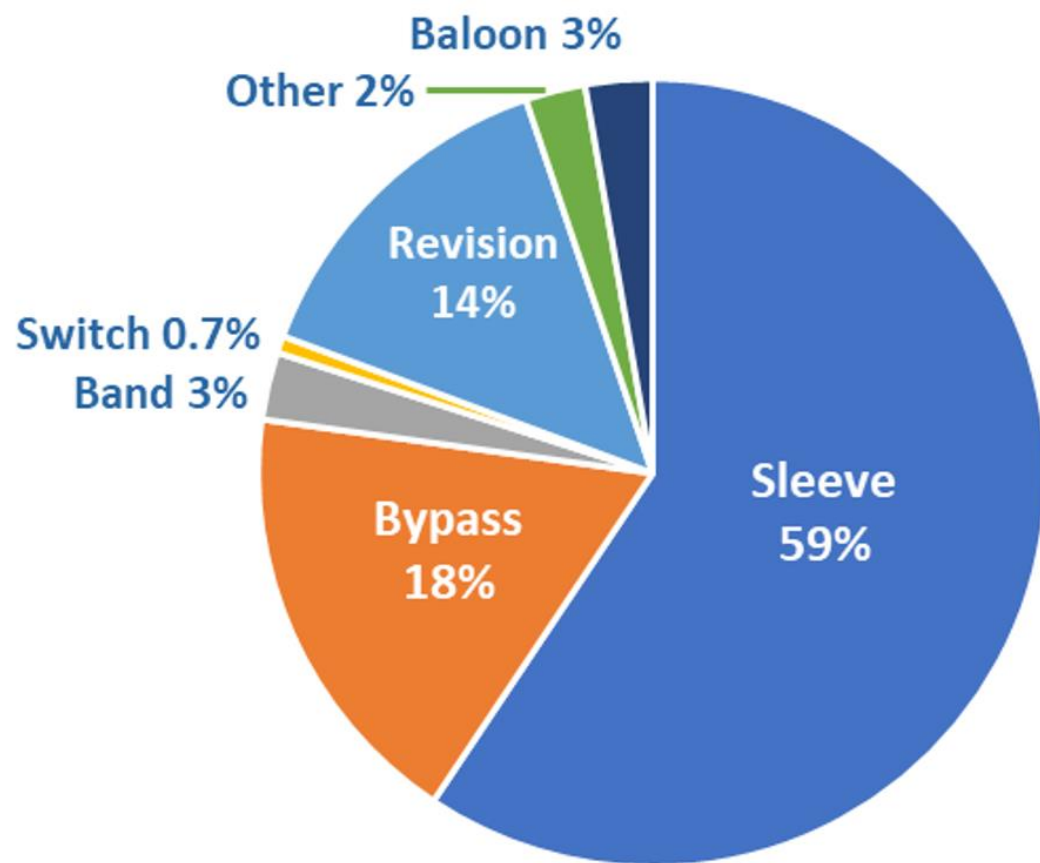
BariatricCalc



ANNALS OF SURGERY
A Monthly Review of Surgical Science Since 1885

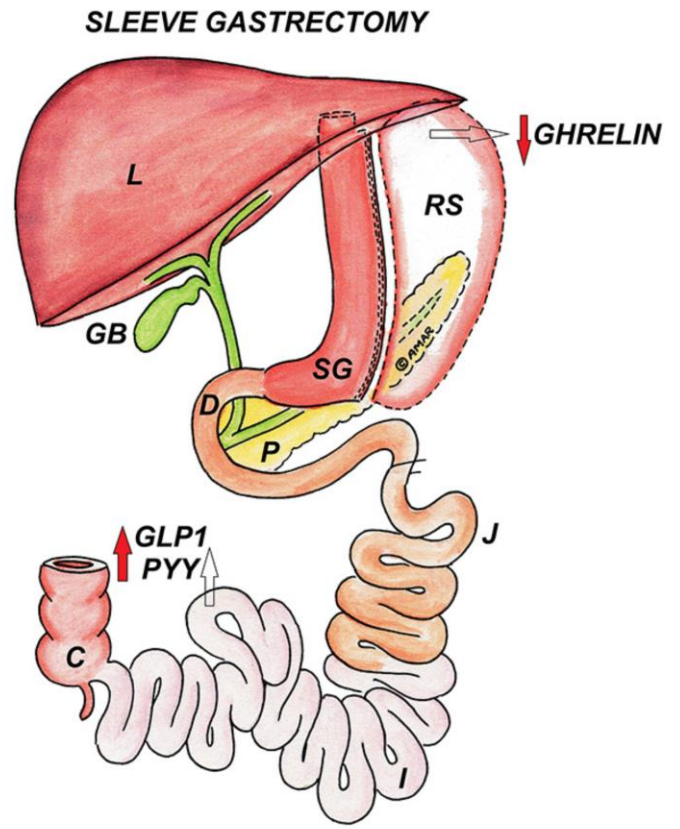
Aminian et al. *Ann Surg.* 2017

Bariatric Surgery Procedures - 2017

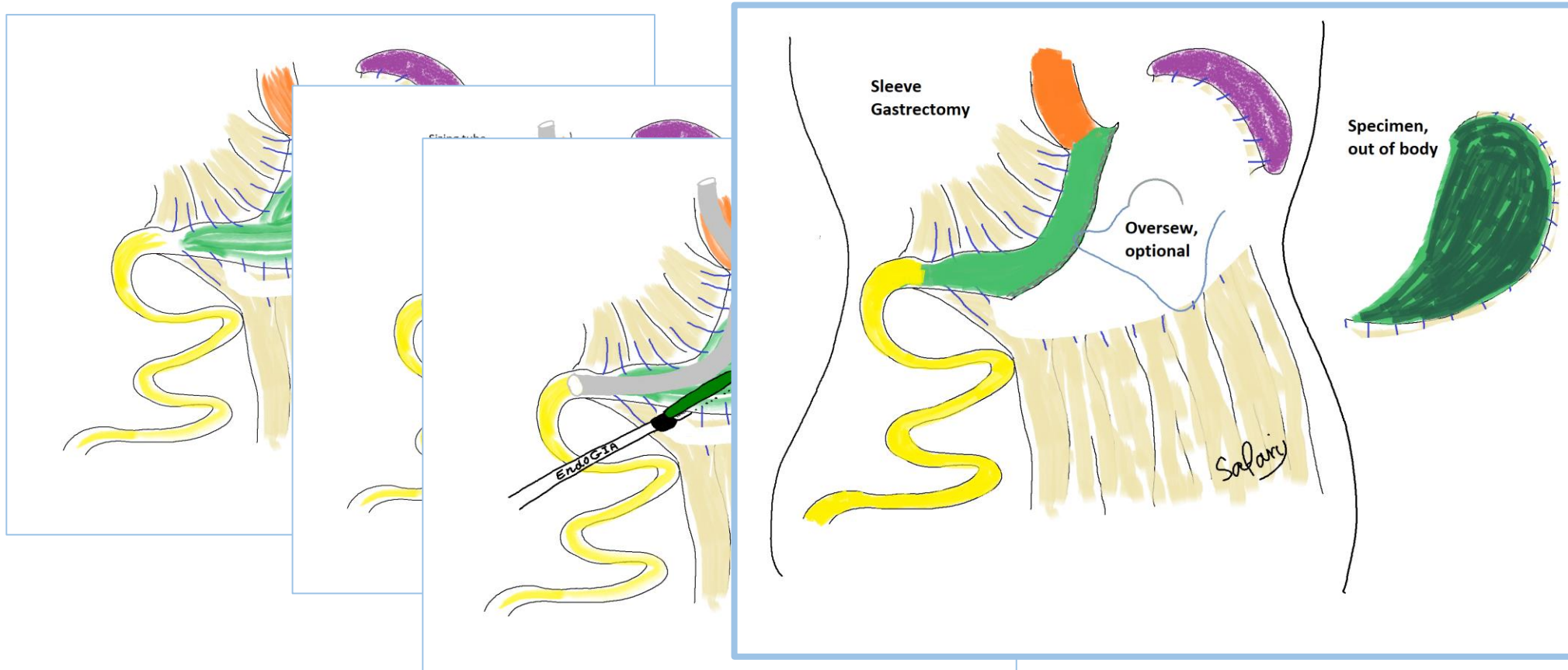


Source: ASMBS, Estimate of Bariatric Surgery Numbers, 2011-2017

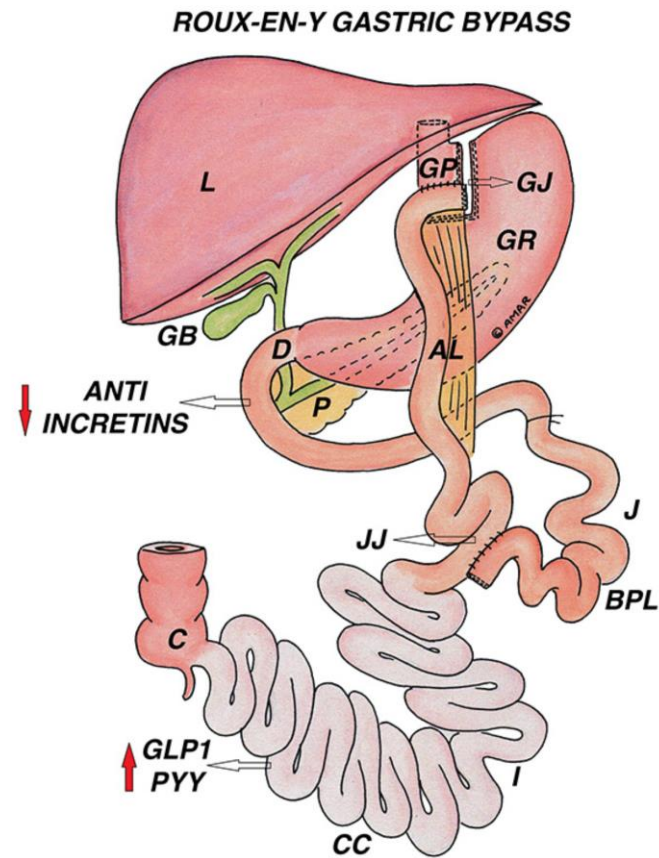
Sleeve gastrectomy



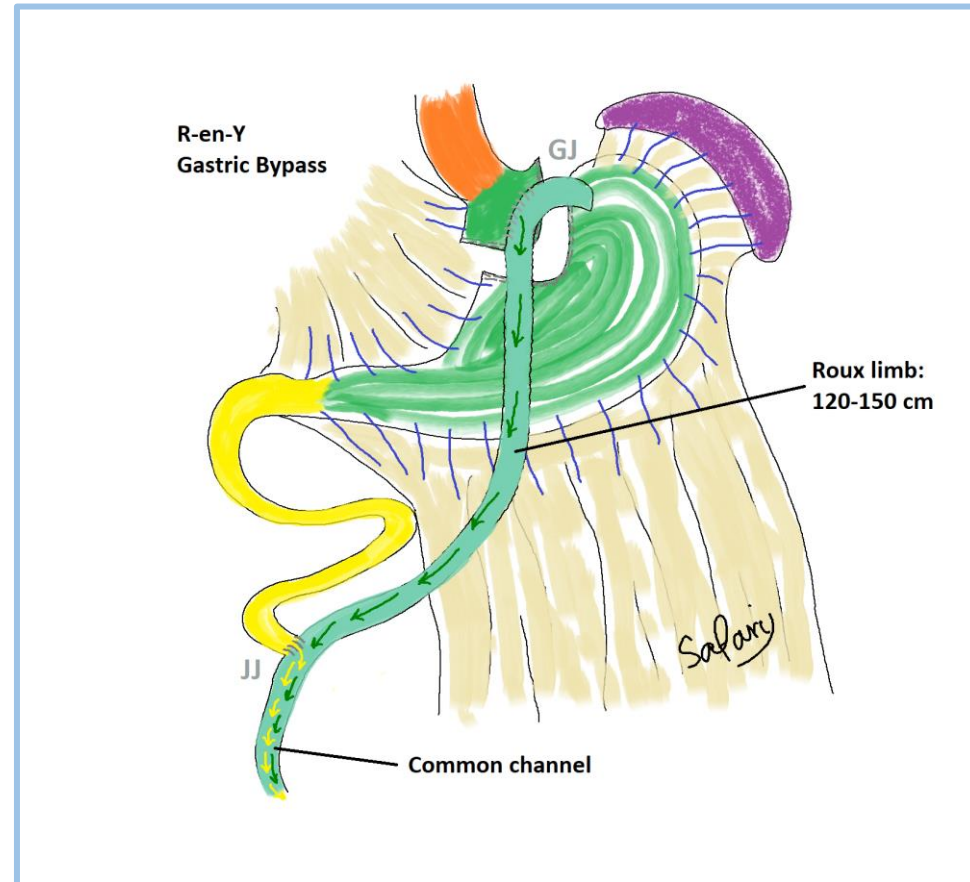
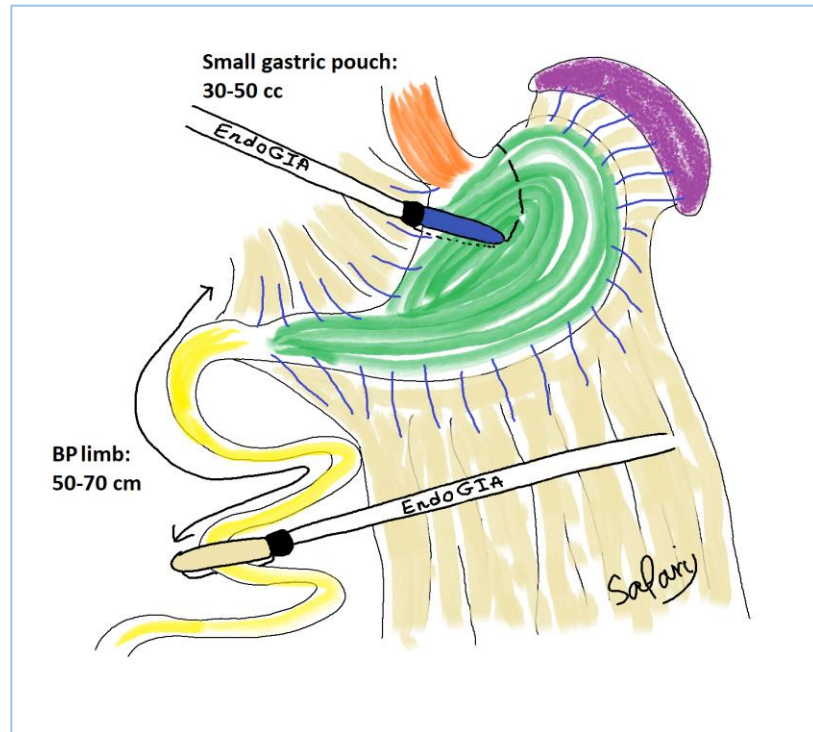
Sleeve gastrectomy steps



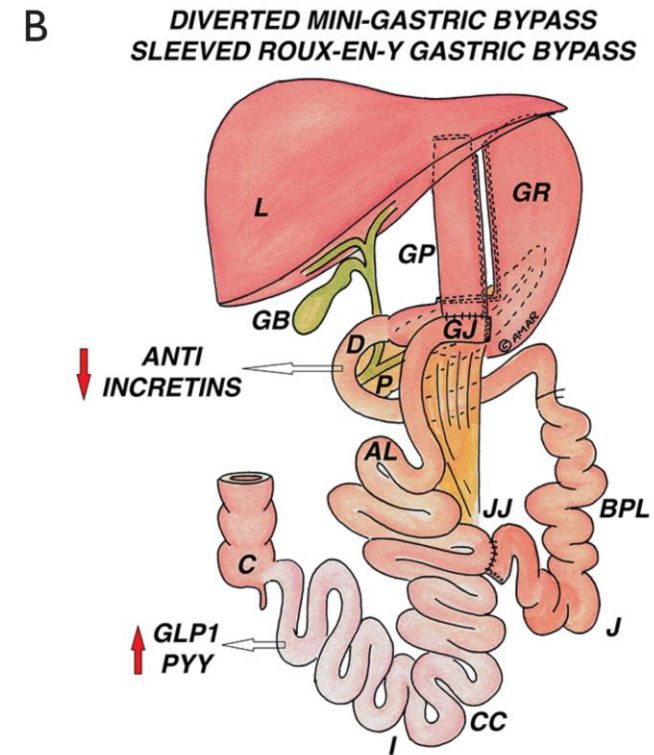
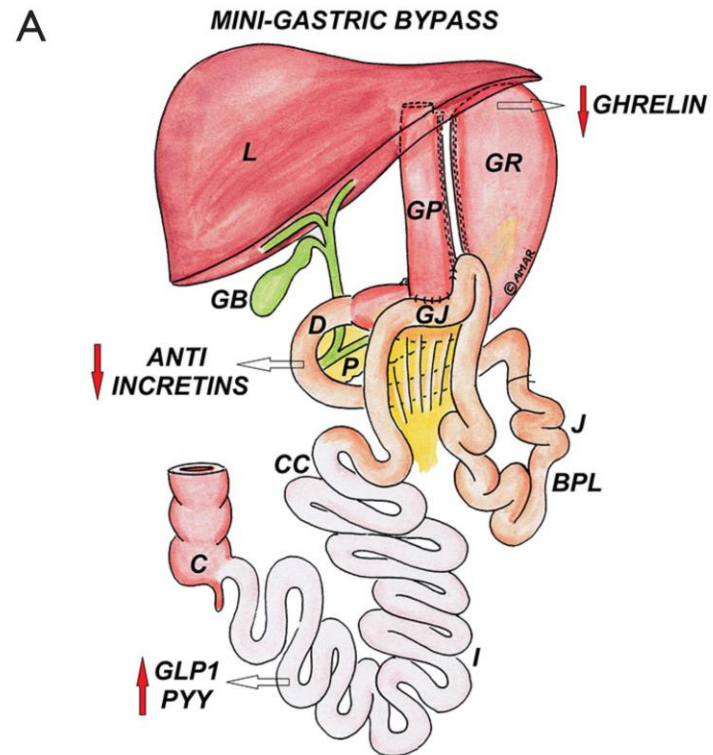
Roux-en-Y Gastric bypass



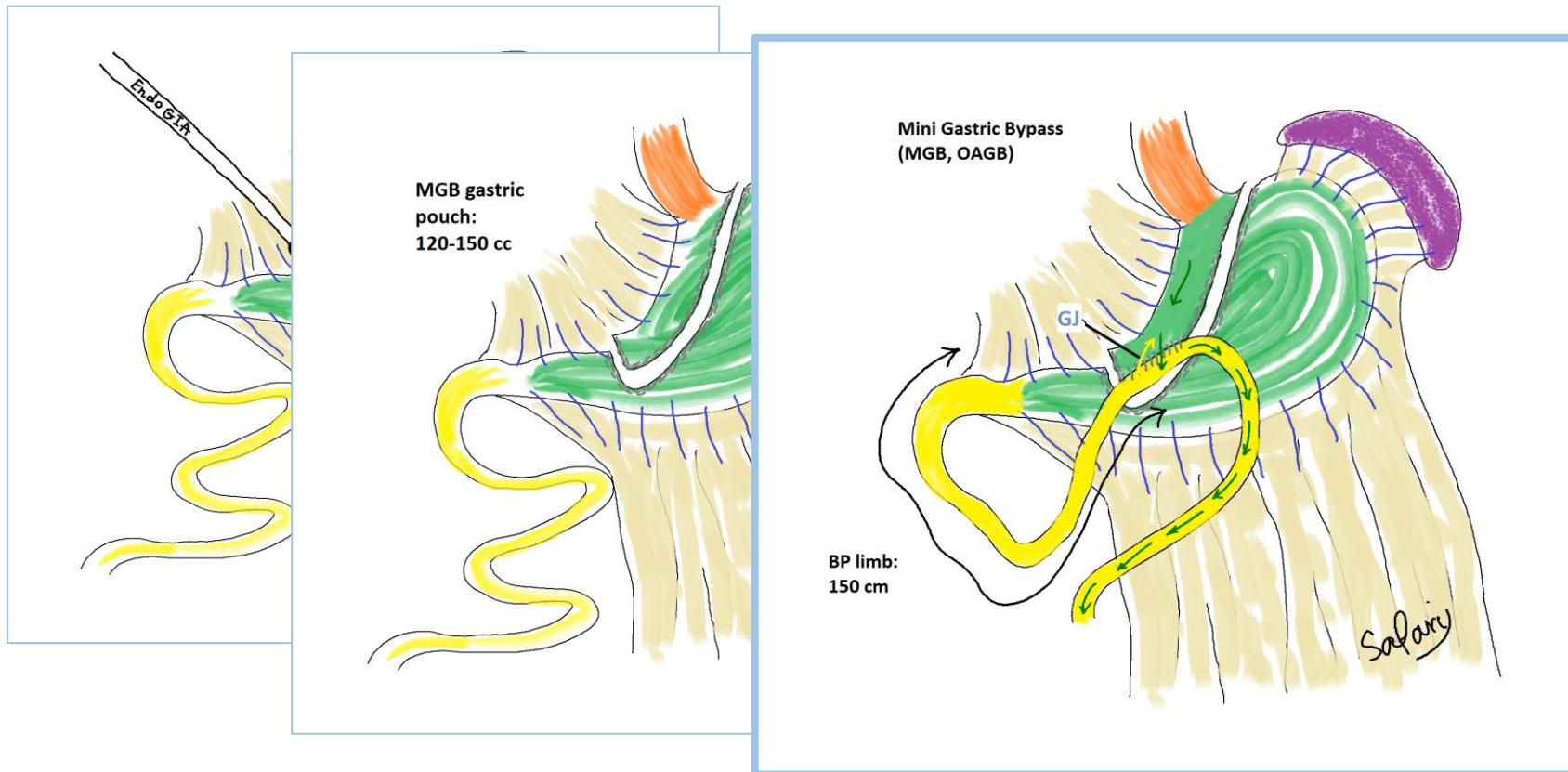
Classic bypass steps



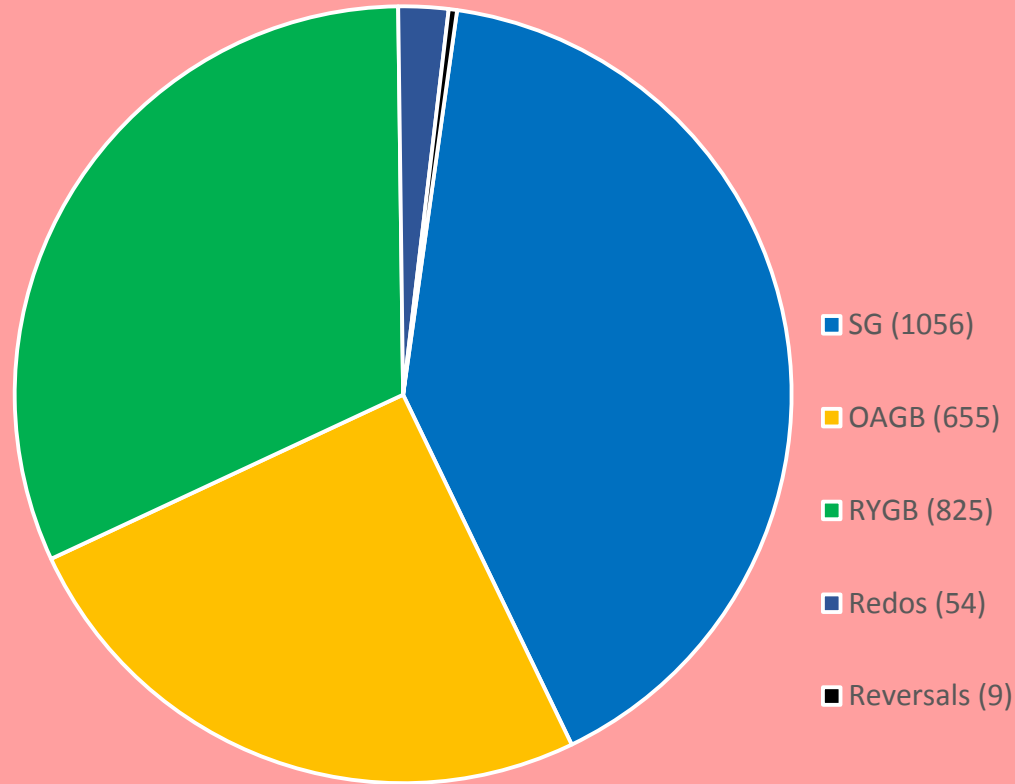
Mini gastric bypass



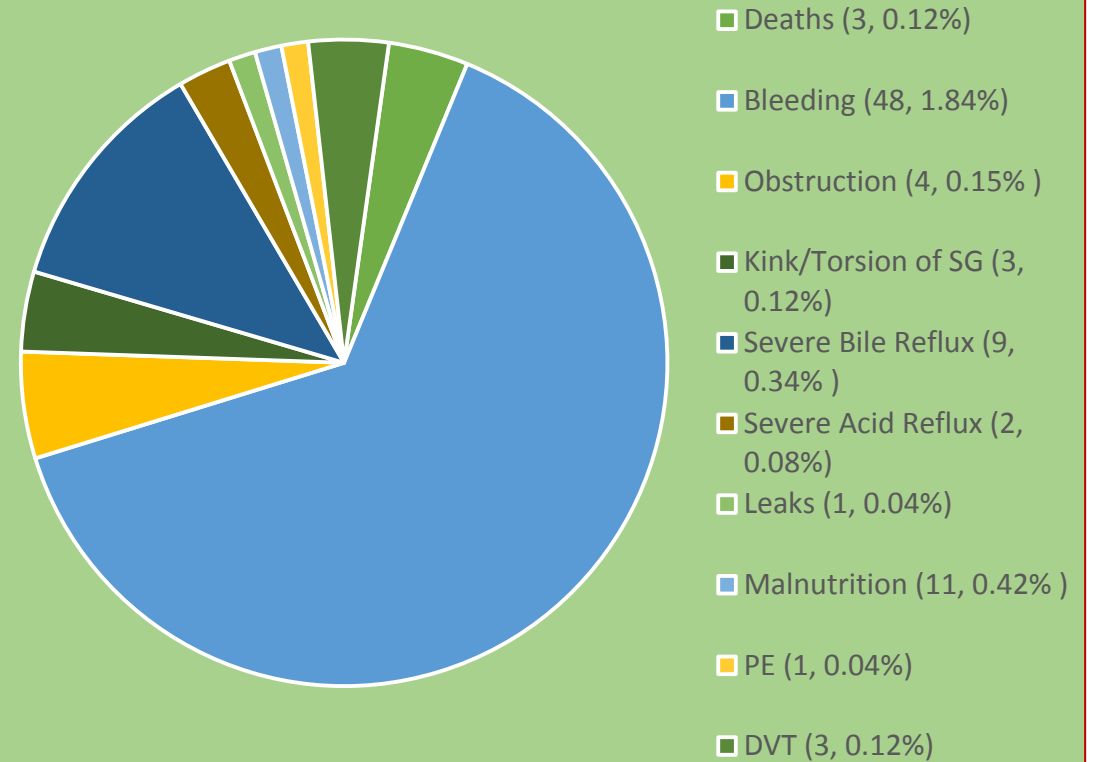
Mini gastric bypass steps



Our Case Mix (2599 cases) - ICMBS



Complications of our surgeries (22 of 1056 cases) - ICMBS



2.7% overall risk of complications

0.12% risk of mortality

Thank you
Any questions?