3° WORKSHOP CONGIUNTO SICOb – SID – SIO
7 MARZO 2014
L'integrazione tra terapia medica e chirurgica nel trattamento del paziente obeso diabetico

Recidive del diabete dopo terapia chirurgica
La quantificazione del problema: quanto e dopo quanto

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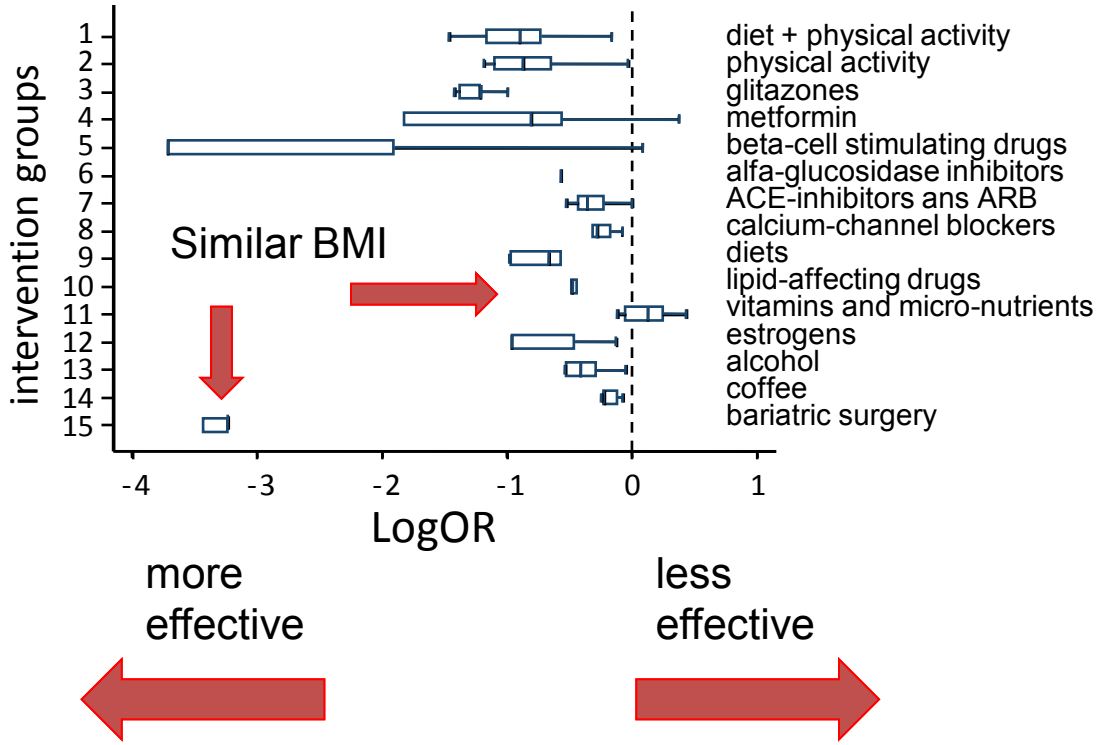
prevention of type 2 diabetes; a systematic review and meta-analysis of different intervention strategies



merlotti et al, diabetes obesity & metabolism (epub 2014)

bariatric surgery for obese type 2 diabetes: random studies

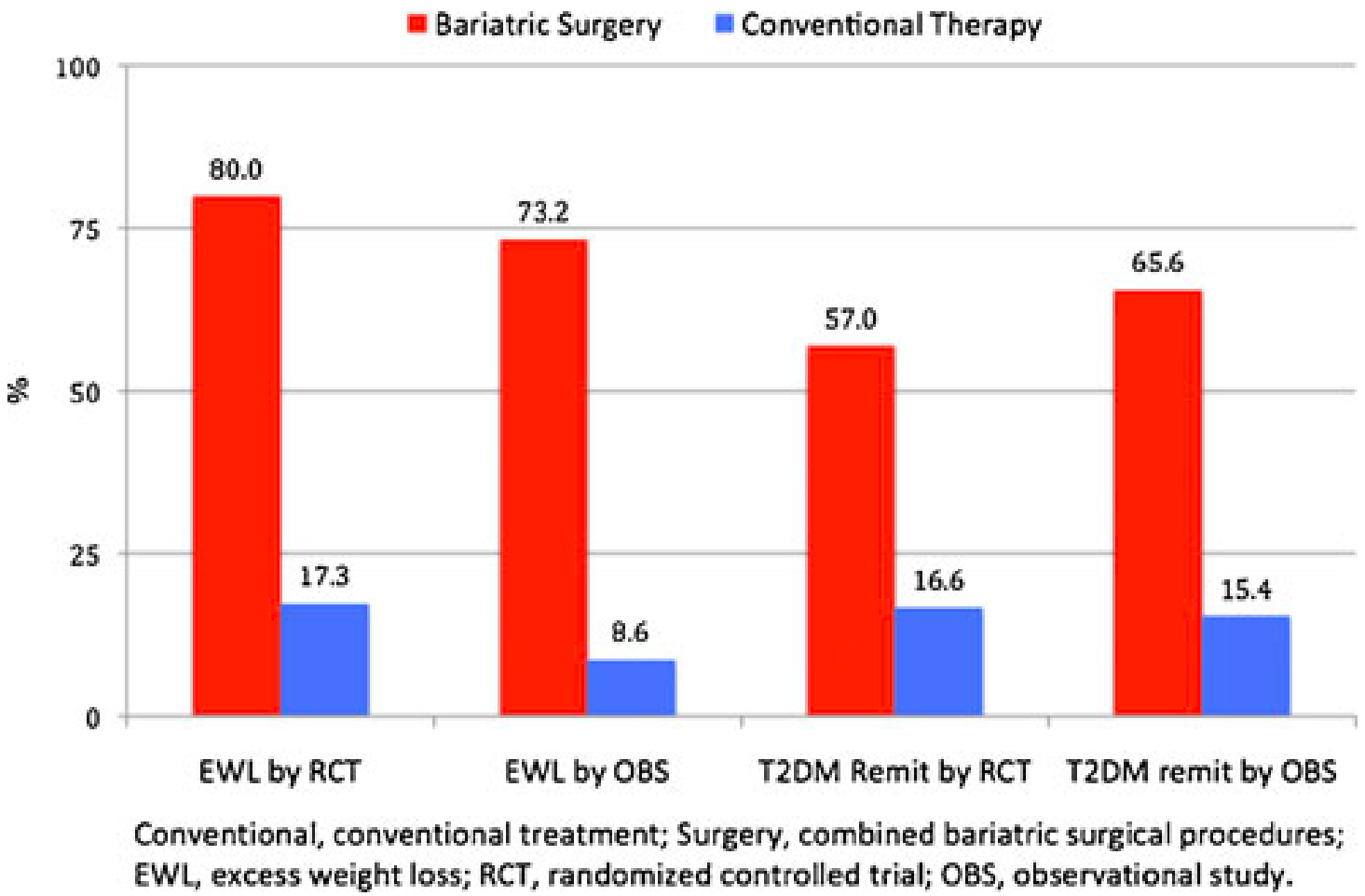
Table 1 Analysis of the three randomized studies comparing surgery and medical treatment in resolution of type 2 diabetes mellitus.

	LAGB vs conventional treatment	RYGB or LSG vs intensive treatment	RYGB or BPD vs conventional treatment
Study reference	1	2	3
Numbers	30 + 30	50 + 50 + 50	20 + 20 + 20
BMI (kg/m^2)	37.0	37.0	45.0
Criteria for T2DM resolution	FBG < 126 mg/dl HbA1c < 6.2%	HbA1c < 6.0%	FBG < 100 mg/dl HbA1c < 6.5%
Waist (cm)	114–116	114–116	125–126
Age (y)	47.0	49.8	43.5
Duration of T2DM (y)	<2	8	6
Weight loss	25.0% vs 1.5%	29% vs 25% vs 5.4%	33% vs 33% vs 5%
Resolution (without medications)	73% vs 13% nd	42% vs 37% vs 12% 29% vs 25% vs 0%	75% vs 95% vs 0% nd
Duration of study (y)	2	1	2
	dixon (JAMA 2008)	**schauer (NEJM 2012)**	**mingrone (NEJM 2012)**

LAGB = laparoscopic adjustable gastric banding; RYGB = gastric bypass; LSG = laparoscopic sleeve gastrectomy; BPD = biliopancreatic diversion; nd = not determined.

pontiroli NMCD 2012

Diabetes and Weight in Comparative Studies of Bariatric Surgery vs Conventional Medical Therapy: A Systematic Review and Meta-Analysis

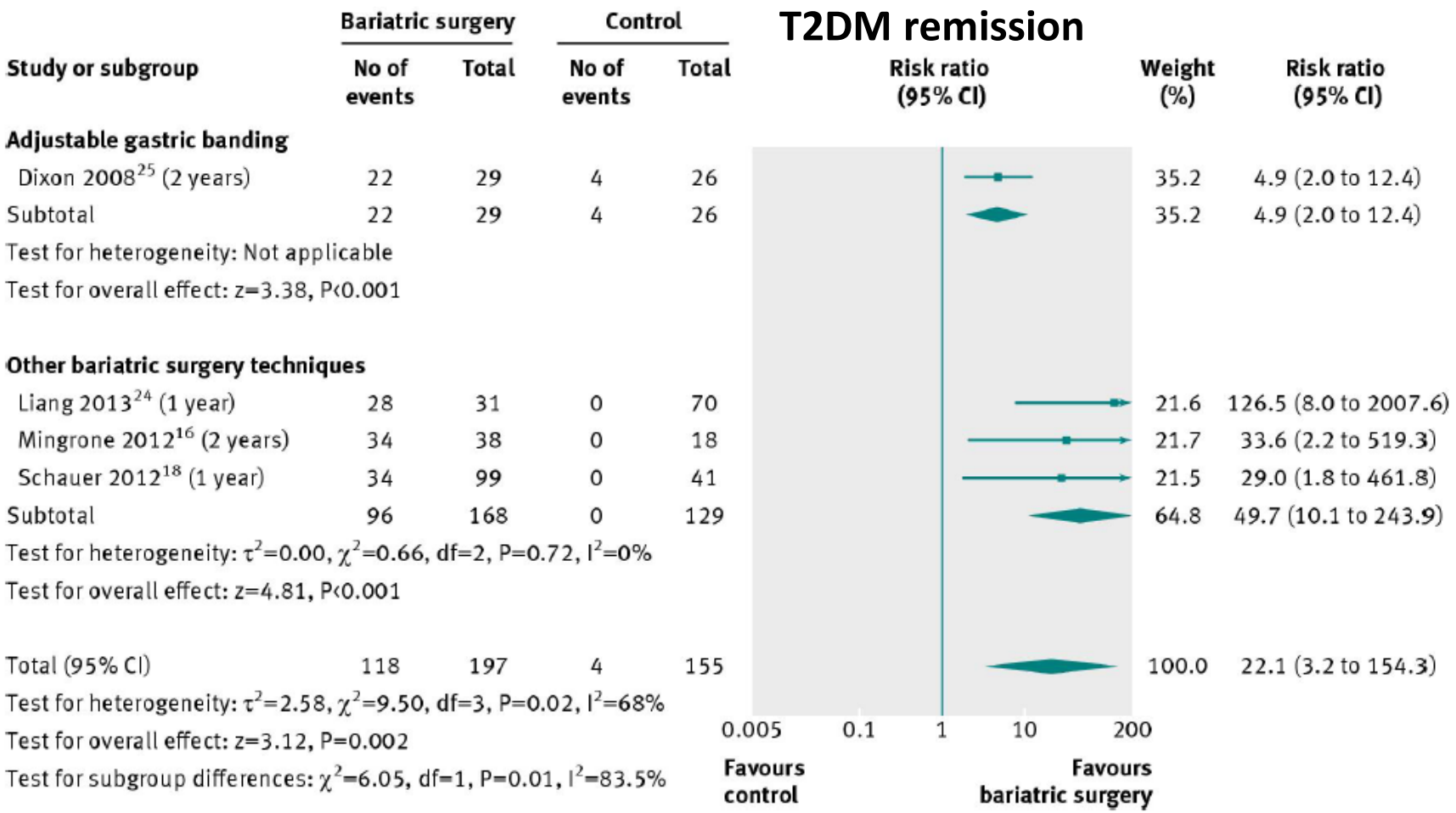


Conventional, conventional treatment; Surgery, combined bariatric surgical procedures; EWL, excess weight loss; RCT, randomized controlled trial; OBS, observational study.

total number 6,131; 3,076 bariatric surgery. 3,055 conventional treatment.

ribaric et al, obes surg 2014; 24: 437-455

Bariatric surgery versus non-surgical treatment for obesity: a systematic review and meta-analysis of randomised controlled trials

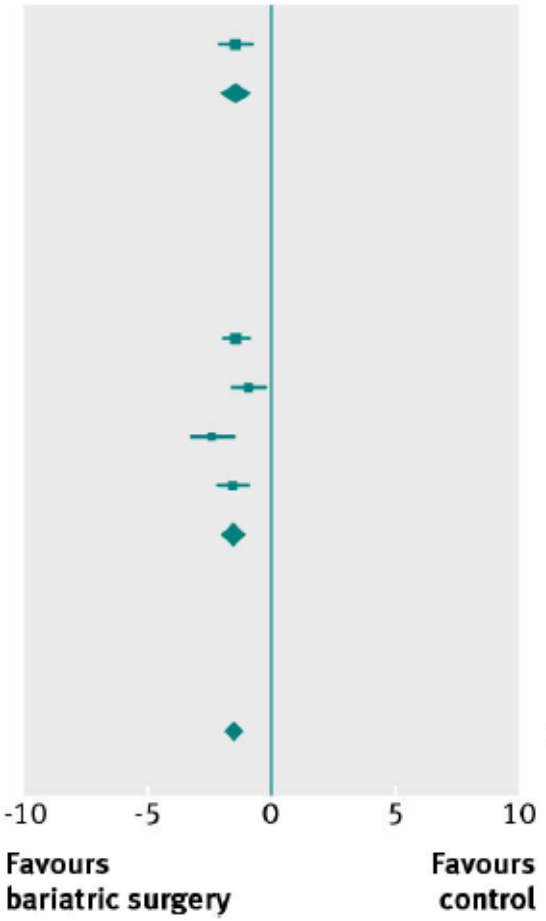


gloy et al BMJ 2013; 347: f5934

Bariatric surgery versus non-surgical treatment for obesity: a systematic review and meta-analysis of randomised controlled trials

final HbA1c

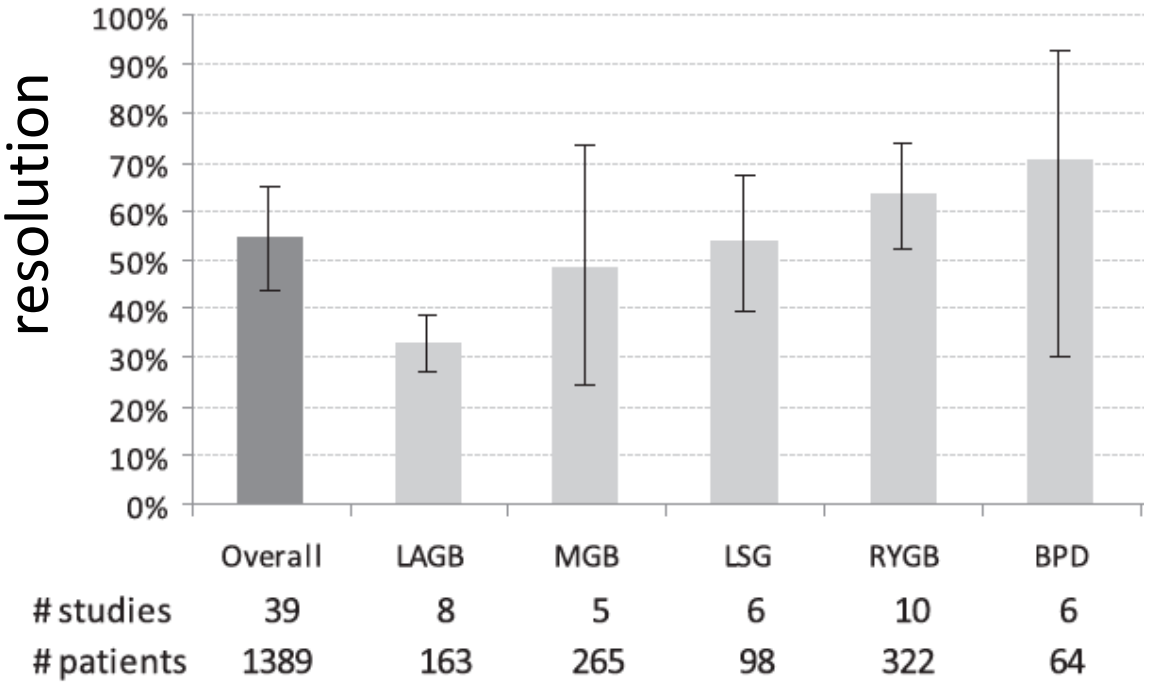
Study or subgroup	Bariatric surgery Mean (SD) change (% points)	Bariatric surgery Total	Control Mean (SD) change (% points)	Control Total	Mean difference (95% CI)	Weight (%)	Mean difference (95% CI)
Adjustable gastric banding							
Dixon 2008[25] (2 years)	-1.8 (1.2)	30	-0.4 (1.3)	30		19.7	-1.4 (-2.0 to -0.8)
Subtotal		30		30		19.7	-1.4 (-2.0 to -0.8)
Test for heterogeneity: Not applicable							
Test for overall effect: z=4.33, P<0.001							
Other bariatric surgery techniques							
Ikramuddin 2013[19] (1 year)	-3.3 (1.3)	56	-1.9 (1.4)	57		24.4	-1.4 (-1.9 to -0.9)
Liang 2013[24] (1 year)	-4.5 (1.5)	31	-3.6 (1.4)	70		20.1	-0.9 (-1.5 to -0.3)
Mingrone 2012[16] (2 years)	-3.2 (2.0)	38	-0.8 (1.1)	18		14.8	-2.4 (-3.2 to -1.6)
Schauer 2012[18] (1 year)	-2.9 (1.7)	99	-1.4 (1.6)	41		21.0	-1.5 (-2.1 to -0.9)
Subtotal		224		186		80.3	-1.5 (-2.0 to -1.0)
Test for heterogeneity: τ^2=0.17, χ^2=8.09, df=3, P=0.04, I^2=63%							
Test for overall effect: z=5.76, P<0.001							
Total (95% CI)		254		216		100.0	-1.5 (-1.9 to -1.1)
Test for heterogeneity: τ^2=0.10, χ^2=8.10, df=4, P=0.09, I^2=51%							
Test for overall effect: z=7.28, P<0.001							
Test for subgroup differences: χ^2=0.05, df=1, P=0.82, I^2=0%							



gloy et al BMJ 2013; 347: f5934

role of bariatric surgery as treatment for type 2 diabetes in patients who do not meet current NIH criteria: a systematic review and meta-analysis (BMI < 35 kg/m^2).

parikh et al, j am coll surg 2013; 217: 527-532



3 RCTs (290 patients BMI 30-40, with or w/o T2DM found surgery associated with greater weight loss (range, 14.4-24 kg) and glycemic control (range, 0.9-1.43 point in HbA1c) during 1 to 2 years of follow-up than nonsurgical treatment.
Observational studies (600 patients) and meta-analyses of nonsurgical therapies (> 300 RCTs) support this finding at 1 or 2 years.

maggard-gibbons et al, JAMA 2013; 309: 2250-2261

Is diabetes cured by bariatric surgery?

Criteria for diabetes and diabetes resolution in bariatric surgery studies

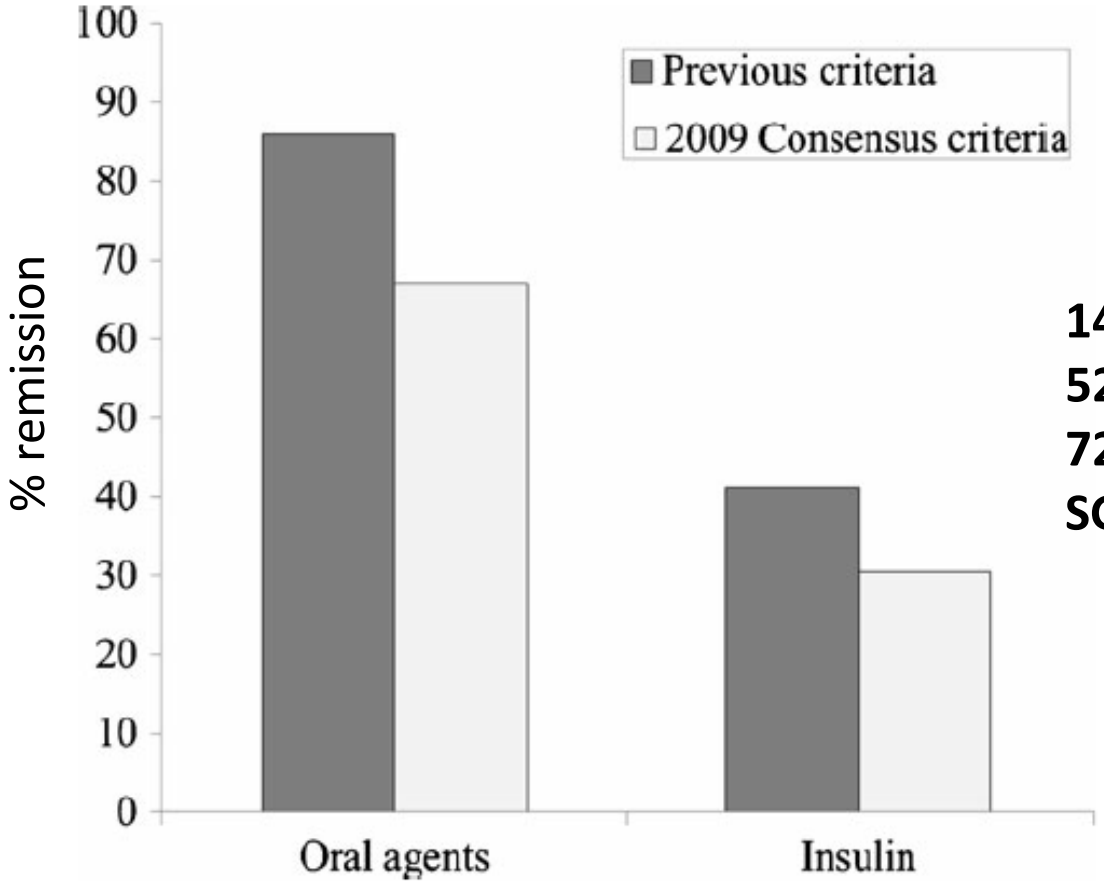
1. Interview (1) and FBG < 126 mg/dl (2)

2. FBG < 126/100 mg/dl, HbA1c < 7/6%, no treatments (3-4)

3. OGTT (NGT, IFG/IGT, T2DM) (5)

(1) Sjostrom, Obes Res 1999; 7: 477-484; (2) sjostrom, N Engl J Med 2004; 351: 2683-2693; (3) Buchwald, Amer J Med 2009; 122: 248-256; (4) Buse, Diabetes Care 2009; 32: 2133-2135; (5) Pontiroli, J Clin Endocrinol Metab 2002; 87: 3555-3561; Pontiroli, Diabetes Care 2005; 28: 2703-2709

Diagnosis of diabetes remission after bariatric surgery may be jeopardized by remission criteria and previous hypoglycemic treatment



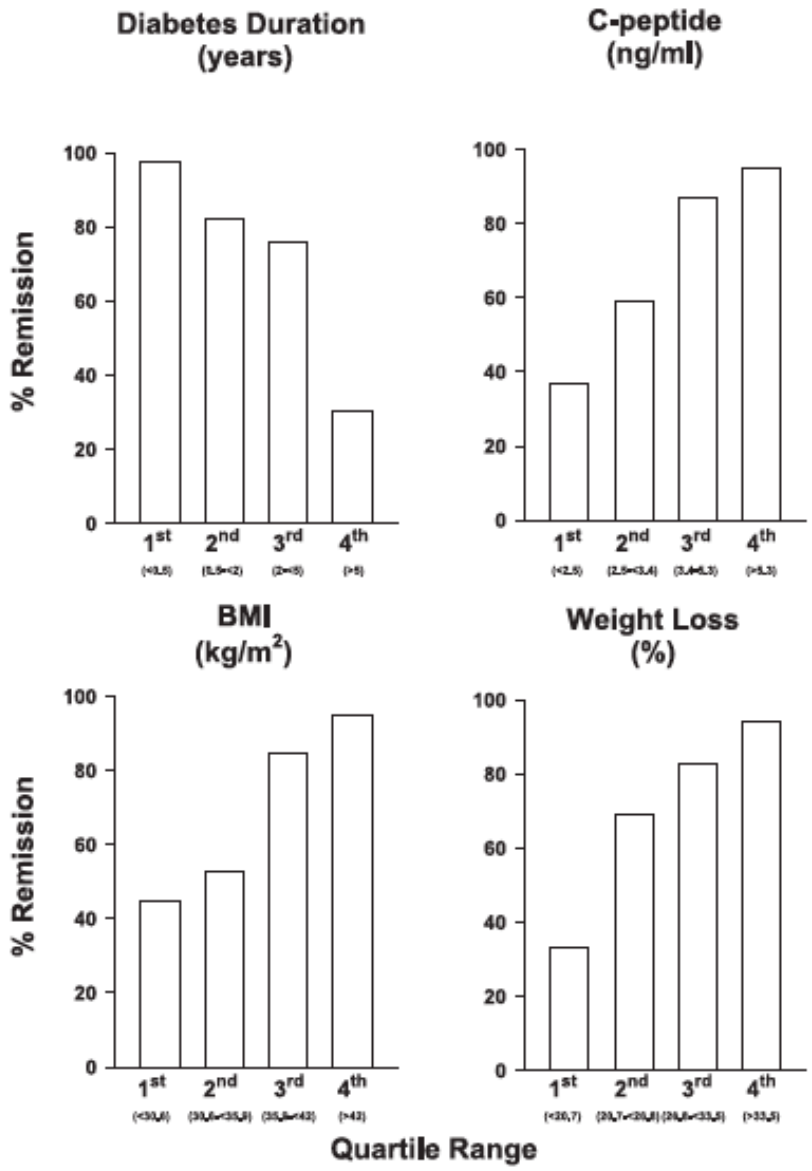
141 T2DM patients:
52 RYGB
72 BPD
SG 17

Duration of diabetes, age, and female sex were associated to nonremission: 10.3 ± 9.4 vs. 4.7 ± 3.8 years, $p < 0.001$; 55.1 ± 9.3 vs. 51.2 ± 9.9 years, $p = 0.017$; 58.9 vs. 33.3%, $p = 0.004$, respectively

ramos-levi et al. obes surg 2013; 23: 1520-1526

Predicting the glycemic response to gastric bypass surgery in patients with type 2 diabetes

154 patients,
104 on remission
at 1 year



dixon et al diabetes care 2013; 36: 20-26

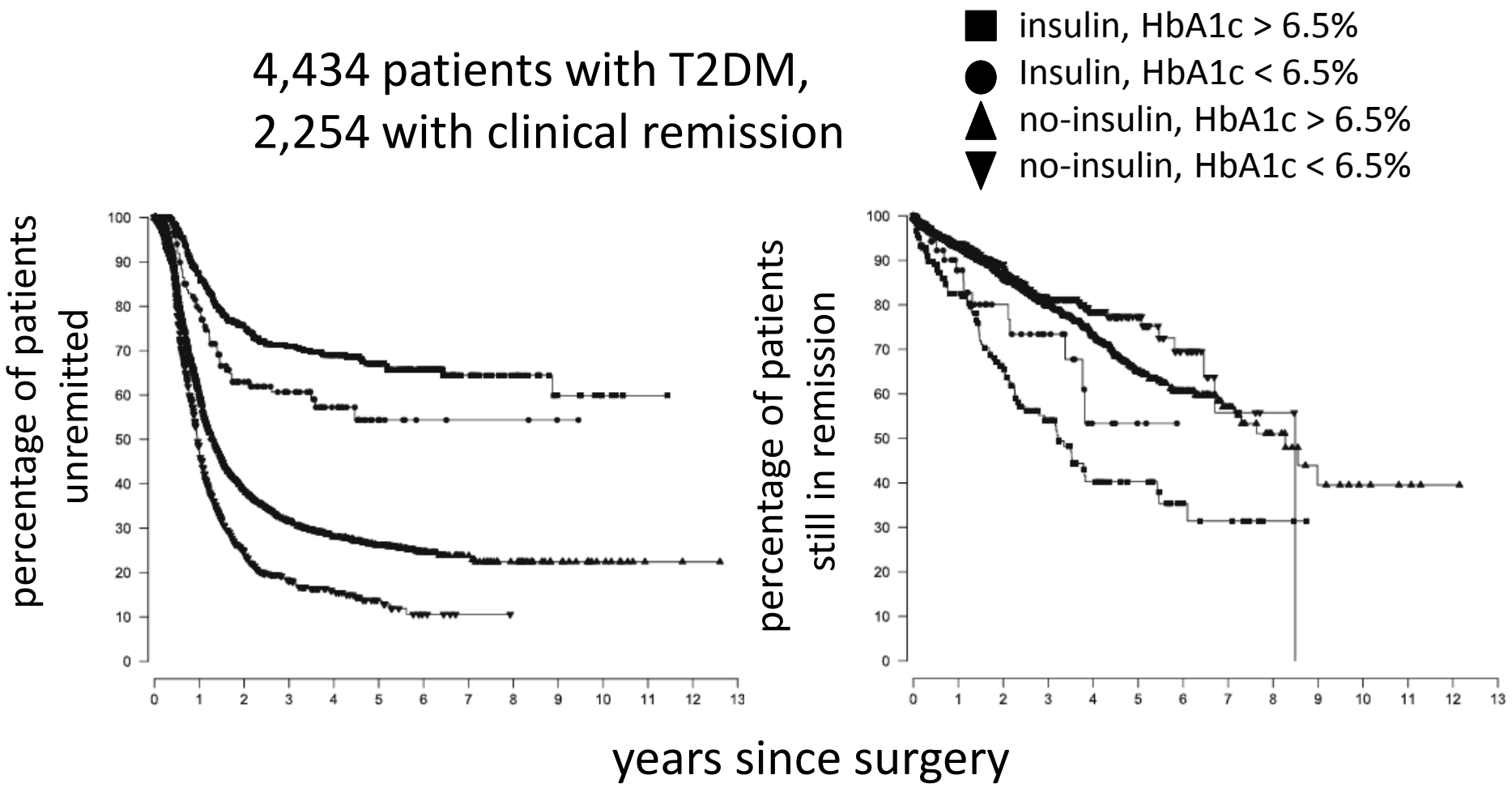
Factors associated with T2DM remission - recurrence

subjects	surgery	remission	recurrence
42 (1)	RYGB	64% improved	24% recurred - Low BMI- poor weight loss – high FBG
177 (2)	RYGB		43% -previous treatments
97 (3)	RYGB	Older, high BMI, use of drugs	
46 (4)	LAGB + RYGB	Duration < 4y, HbA1c < 7.1, BMI < 50	
126 (5)	RYGB	C peptide	
153 (6)	RYGB + LSG		Older age, insulin use, weight regain
269 (7)	RYGB		Weight regain

(1) digiorgi et al SOARD 2010; 6. 249-253; (2) chikunguwo et al SOARD 2010; 6: 254-259; (3) yamaguchi et al, surg endosc 2012; 26: 2843-2847;(4) robert et al obes surg 2013; 23: 770-775; (5) aarts et al obes surg 2013; 23: 867-873; (6) jmenez et al ann surg 2012; 256: 1023-1029; (7) campos et al ABCD 2013; 26 (suppl 1): 57-62

a multisite study of long-term remission and relapse of T2DM following gastric bypass

4,434 patients with T2DM,
2,254 with clinical remission



predictors of relapse: high HbA1c, oral agents or insulin, low weight loss, duration of T2DM > 5 years

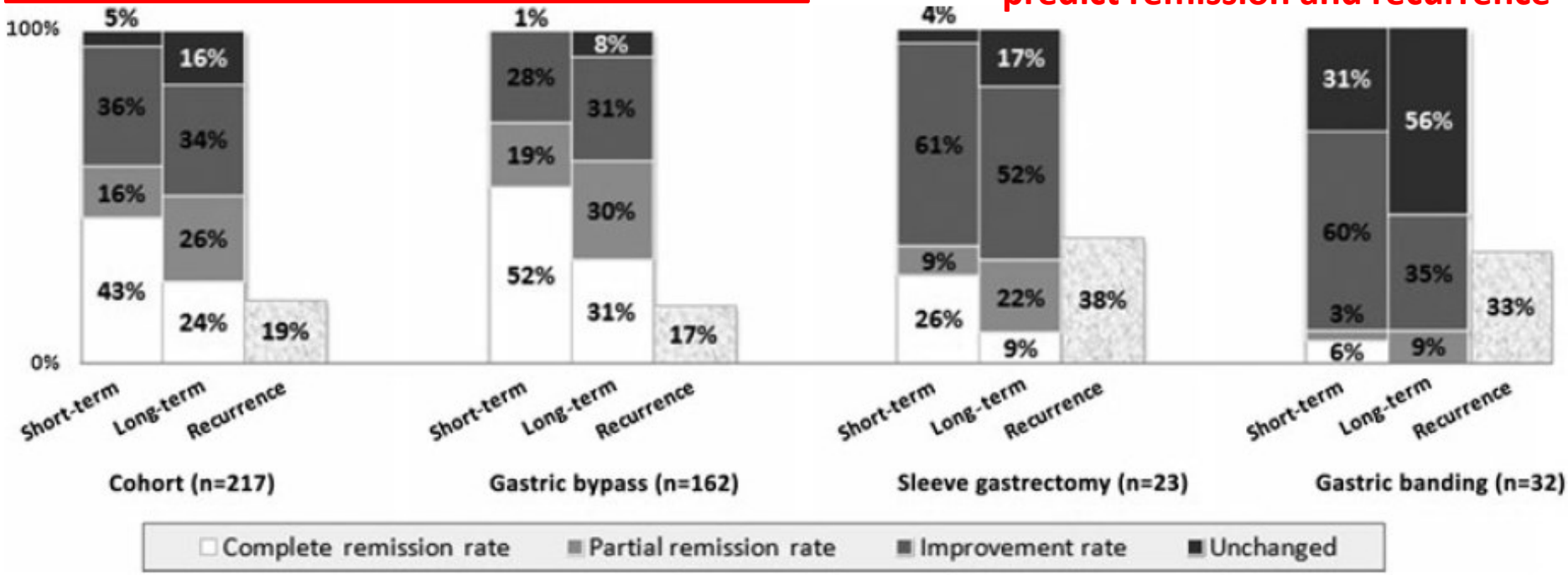
Arterburn et al, Obes Surg 2013; 23: 93-102.

Can diabetes be surgically cured? Long-term metabolic effects of bariatric surgery in obese patients with type 2 diabetes mellitus

	Whole Cohort	Gastric Bypass	Sleeve Gastrectomy	*P*1	Gastric Banding	*P*2
Total weight loss (%)						
Short-term	27.6 ± 10.1	30.9 ± 8.3	21.2 ± 10.6	<0.001	16.5 ± 7.6	0.068
Long-term	25.4 ± 11.9	28.1 ± 10.9	22.2 ± 9.3	0.015	13.2 ± 10.7	0.002
EWL (%)						
Short-term	60.3 ± 24.3	66.8 ± 20.4	49.7 ± 32.5	0.029	37.0 ± 17.8	0.112
Long-term	54.9 ± 26.7	60.5 ± 24.6	49.5 ± 24.9	0.047	29.5 ± 23.4	0.004

All values are mean ± SD.
Short-term: 1–2 yrs after surgery; Long-term: 5 yrs or more after surgery.
*P*1: gastric bypass vs sleeve gastrectomy; *P*2: sleeve gastrectomy vs gastric banding.

T2DM duration and weight loss predict remission and recurrence



long-term control rates of HDL, LDL, TG, AH were 73%, 72%, 80%, and 62%, respectively. diabetic nephropathy regressed (53%) or stabilized (47%).

brethauer et al ann surg 2013; 258: 628-636

The future:

Proper identification of candidates

Avoid dichotomy between surgery and drugs

(Expectations of patients and clinicians may have to be adjusted as regards remission of type 2 diabetes after bariatric surgery, Pournaras, Br J Surg 2012; 99: 100–103)

The effect of bariatric surgery can be of limited time value, but other efffects can last longer