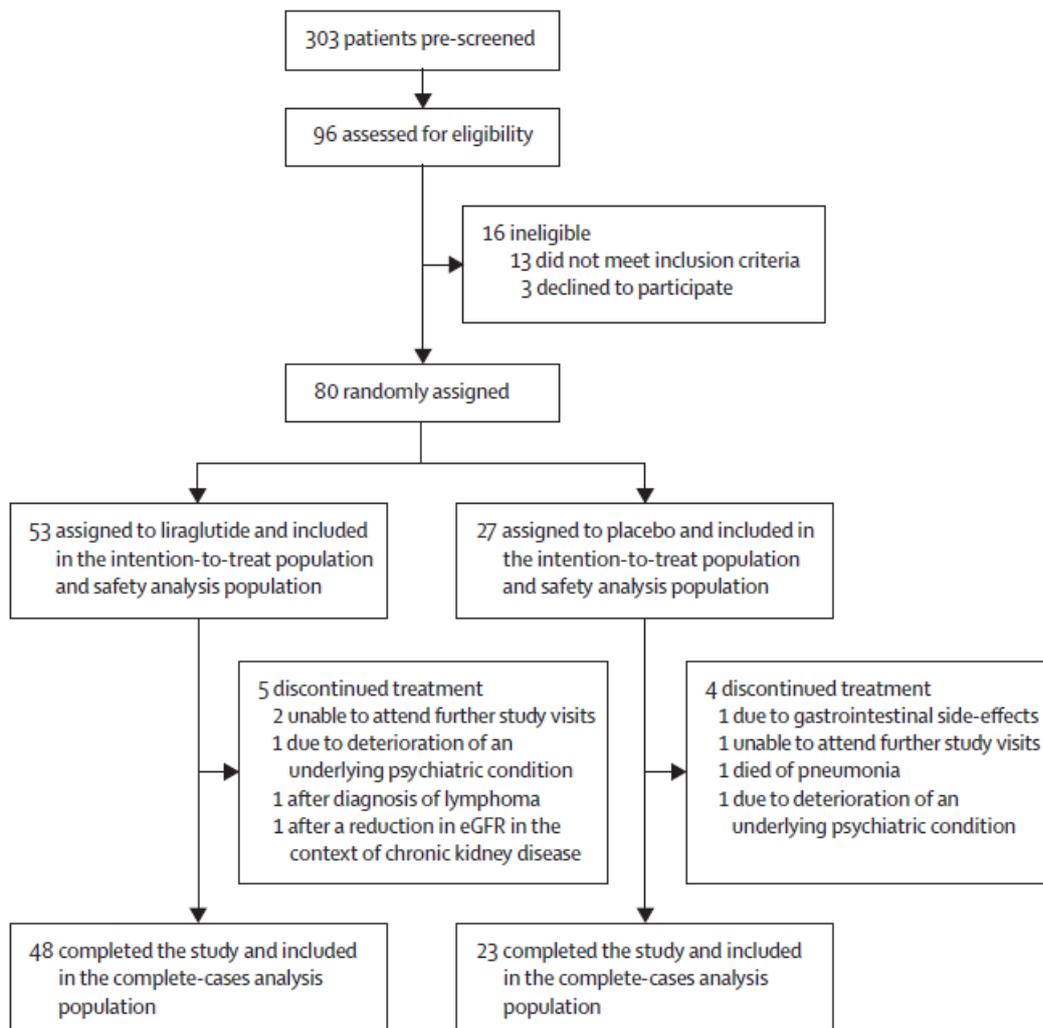


## Participant Flow



## Baseline Characteristics

	Total cohort		Vertical sleeve gastrectomy		Roux-en-Y gastric bypass	
	Placebo (n=27)	Liraglutide (n=53)	Placebo (n=8)	Liraglutide (n=11)	Placebo (n=19)	Liraglutide (n=42)
Sex						
Men	13 (48%)	20 (38%)	5 (63%)	5 (45%)	8 (42%)	15 (36%)
Women	14 (52%)	33 (62%)	3 (38%)	6 (55%)	11 (58%)	27 (64%)
Median age in years (IQR)	57.0 (52.0–64.0)	55.0 (50.0–61.0)	56.5 (51.8–60.5)	57.0 (51.0–68.0)	60.0 (52.0–64.0)	54.0 (49.8–69.0)
Diabetes duration (years)	19.6 (8.0)	16.4 (7.0)	17.4 (7.2)	16.2 (7.4)	20.5 (8.3)	16.4 (7.0)
Time since surgery (years)	3.8 (2.4)	3.8 (2.0)	3.4 (1.8)	4.9 (1.8)	3.9 (2.7)	4.0 (2.1)
HbA <sub>1c</sub> (mmol/mol)	57.7 (8.2)	63.3 (15.2)	60.9 (12.3)	59.6 (18.0)	56.3 (5.7)	64.3 (14.5)
HbA <sub>1c</sub> (%)	7.4 (0.75)	7.9 (1.39)	7.7 (1.13)	7.6 (1.65)	7.3 (0.52)	8.0 (1.33)
Fasting glucose (mmol/L)	7.5 (2.9)	8.2 (3.2)	7.4 (1.9)	8.1 (4.3)	7.5 (3.2)	8.2 (2.9)
Fasting insulin (mIU/L)	7.3 (1.7)	9.2 (9.0)	13.5 (4.8)	9.5 (10.9)	8.1 (5.9)	9.1 (8.4)
HOMA2 (% insulin sensitivity)	96.1 (50.2)	124.1 (81.7)	61.9 (28.8)	137.1 (113.6)	117.2 (49.6)	119.2 (67.9)
Bodyweight (kg)	103.5 (27.0)	100.7 (20.7)	111.6 (37.4)	114.0 (23.2)	100.1 (21.6)	97.2 (18.7)
BMI (kg/m <sup>2</sup> )	37.0 (7.7)	36.1 (7.8)	38.1 (10.3)	40.1 (8.4)	36.5 (6.6)	35.1 (7.4)
Preoperative bodyweight (kg)	130.8 (29.7)	127.8 (25.7)	135.5 (43.8)	132.1 (29.0)	128.8 (22.7)	126.8 (25.1)
Nadir bodyweight after surgery (kg)	92.8 (19.6)	89.0 (18.7)	95.3 (22.8)	104.3 (21.7)	91.8 (18.7)	85.3 (16.2)
Percentage weight change after surgery (at screening)	-20.3% (12.9)	-20.9% (10.0)	-16.5% (11.7)	-13.9% (4.1)	-21.8% (13.4)	-22.6% (10.3)
Weight regain from nadir to screening (kg)	10.8 (12.6)	11.5 (8.8)	16.4 (19.0)	9.3 (5.7)	8.4 (8.4)	12.0 (9.4)
King's Obesity Staging Criteria score	10.4 (3.9)	11.2 (3.9)	11.0 (4.5)	12.5 (3.9)	10.2 (3.7)	10.8 (3.9)
Use of oral glucose-lowering drugs						
None	5 (19%)	13 (25%)	1 (13%)	3 (27%)	4 (21%)	10 (24%)
One	15 (56%)	30 (57%)	5 (63%)	5 (45%)	10 (53%)	25 (60%)
Two	6 (22%)	8 (15%)	2 (25%)	2 (18%)	4 (21%)	6 (14%)
Three	1 (4%)	2 (4%)	0	1 (9%)	1 (5%)	1 (2%)
Median number of glucose-lowering drugs per patient (IQR)	1.0 (1.0–1.5)	1.0 (1.0–1.0)	1.0 (1.0–1.3)	1.0 (0.5–1.5)	1.0 (1.0–1.5)	1.0 (1.0–1.0)
Types of oral glucose-lowering drugs						
Metformin	21 (78%)	38 (72%)	7 (89%)	8 (73%)	14 (74%)	30 (71%)
Sulfonylureas	2 (7%)	4 (8%)	0	1 (9%)	2 (11%)	3 (7%)
SGLT2 inhibitors	7 (26%)	2 (4%)	2 (25%)	1 (9%)	5 (26%)	1 (2%)
Insulin use	6 (22%)	15 (28%)	1 (13%)	1 (9%)	5 (26%)	14 (33%)
Systolic blood pressure (mm Hg)	137.5 (16.8)	127.9 (15.7)	132.1 (12.7)	126.3 (12.8)	139.8 (18.0)	128.3 (16.5)
Diastolic blood pressure (mm Hg)	72.3 (10.3)	73.8 (12.2)	80.9 (8.1)	72.5 (10.4)	68.6 (9.0)	74.2 (12.8)
Heart rate (beats per min)	72.8 (12.5)	77.6 (11.6)	79.6 (17.1)	76.2 (12.5)	70.0 (9.1)	78.2 (11.7)
Total cholesterol (mmol/L)	4.2 (1.2)	4.5 (1.0)	4.7 (1.6)	4.8 (1.0)	4.0 (1.0)	4.4 (1.0)
LDL cholesterol (mmol/L)	2.2 (0.9)	2.5 (0.8)	2.5 (1.1)	2.8 (0.6)	2.0 (0.8)	2.4 (0.9)
HDL cholesterol (mmol/L)	1.3 (0.4)	1.3 (0.3)	1.2 (0.3)	1.3 (0.3)	1.4 (0.5)	1.3 (0.3)
Triglycerides (mmol/L)	1.5 (1.1)	1.8 (2.2)	2.3 (1.7)	1.6 (1.2)	1.2 (0.7)	1.8 (2.3)

## Outcome measures

	Baseline value	Treatment (liraglutide vs placebo)	Type of surgery (VSG vs RYGB)
HbA <sub>1c</sub> (mmol/mol)	0.70 (0.48 to 0.91; p<0.0001)	-13.3 (-19.7 to -7.0; p=0.0001)	-4.67 (-11.4 to 2.0; p=0.17)
HbA <sub>1c</sub> (%)	0.06 (0.04 to 0.08; p<0.0001)	-1.22 (-1.80 to -0.64; p=0.0001)	-0.43 (-1.04 to 0.18; p=0.17)
Bodyweight (kg)	0.95 (0.89 to 1.00; p<0.0001)	-4.23 (-6.81 to -1.64; p=0.0017)	-2.04 (-5.00 to 0.93; p=0.18)
Systolic blood pressure (mm Hg)	0.65 (0.47 to 0.84; p<0.0001)	2.14 (-4.52 to 8.80; p=0.52)	-3.99 (-10.80 to 2.81; p=0.25)
Diastolic blood pressure (mm Hg)	0.51 (0.33 to 0.70; p<0.0001)	2.88 (-1.67 to 7.44; p=0.21)	-1.41 (-6.36 to 3.55; p=0.57)
Total cholesterol (mmol/L)	0.58 (0.42 to 0.75; p<0.0001)	-0.03 (-0.41 to 0.35; p=0.88)	-0.36 (-0.77 to 0.05; p=0.087)
LDL cholesterol (mmol/L)	0.73 (0.55 to 0.92; p<0.0001)	0.04 (-0.29 to 0.37; p=0.82)	-0.23 (-0.58 to 0.13; p=0.21)
HDL cholesterol (mmol/L)	0.89 (0.74 to 1.03; p<0.0001)	0.03 (-0.08 to 0.15; p=0.54)	-0.03 (-0.15 to 0.09; p=0.62)
Triglycerides (mmol/L)	0.18 (0.10 to 0.25; p<0.0001)	-0.26 (-0.56 to 0.04; p=0.089)	-0.29 (-0.61 to 0.04; p=0.081)
King's Obesity Staging Criteria score	0.84 (0.70 to 0.98; p<0.0001)	0.23 (-0.87 to 1.32; p=0.68)	-0.66 (-1.86 to 0.53; p=0.27)

## Adverse events

	Total cohort				Vertical sleeve gastrectomy				Roux-en-Y gastric bypass			
	Placebo (n=27)		Liraglutide (n=53)		Placebo (n=8)		Liraglutide (n=11)		Placebo (n=19)		Liraglutide (n=42)	
Any adverse events	11	(41%)	24	(45%)	4	(50%)	7	(64%)	7	(37%)	17	(40%)
Gastrointestinal events												
Nausea	4	(15%)	9	(17%)	1	(13%)	1	(9%)	3	(16%)	8	(19%)
Diarrhoea	2	(7%)	1	(2%)	2 (25%)		1	(9%)	0		0	
Constipation	2	(7%)	4	(8%)	1	(13%)	4	(36%)	1	(5%)	0	
Vomiting	1	(4%)	0		1	(13%)	0		0		0	
Abdominal discomfort	0		2	(4%)	0		1	(9%)	0		1	(2%)
Gastro-oesophageal reflux	0		1	(2%)	0		0		0		1	(2%)
General events												
Headache	0		1	(2%)	0		0		0		1	(2%)
Injection-site bruising	0		1	(2%)	0		1	(9%)	0		0	
Pain	1	(4%)	0		0		0		1	(5%)	0	
Vascular events												
Dizziness	1	(4%)	0		1	(13%)	0		0		0	
Infections												
Respiratory tract	2	(7%)	1	(2%)	1	(13%)	0		1	(5%)	1	(2%)
Gastroenteritis	1	(4%)	0		1	(13%)	0		0		0	
Urinary tract infection	1	(4%)	0		0		0		1	(5%)	0	
Metabolic and nutritional events												
Decreased appetite	1	(4%)	3	(6%)	1	(13%)	2	(18%)	0		1	(2%)
Hypoglycaemia	1	(4%)	2	(4%)	0		0		1	(5%)	2	(5%)
Peripheral oedema	0		1	(2%)	0		0		0		1	(2%)
Neurological events												
Facial paralysis*	1	(4%)	0		1	(13%)	0		0		0	
Serious adverse events												
Cellulitis	1	(4%)	0		0		0		1	(5%)	0	
Progression of chronic kidney disease	0		1	(2%)	0		0		0		1	(2%)
Lymphoma	0		1	(2%)	0		0		0		1	(2%)
Death	1	(4%)	0		0		0		1	(5%)	0	