Laparoscopic Vertical Sleeve Gastrectomy: A Novel Bariatric Procedure – Superior to Established Operations?

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American College of Surgeons
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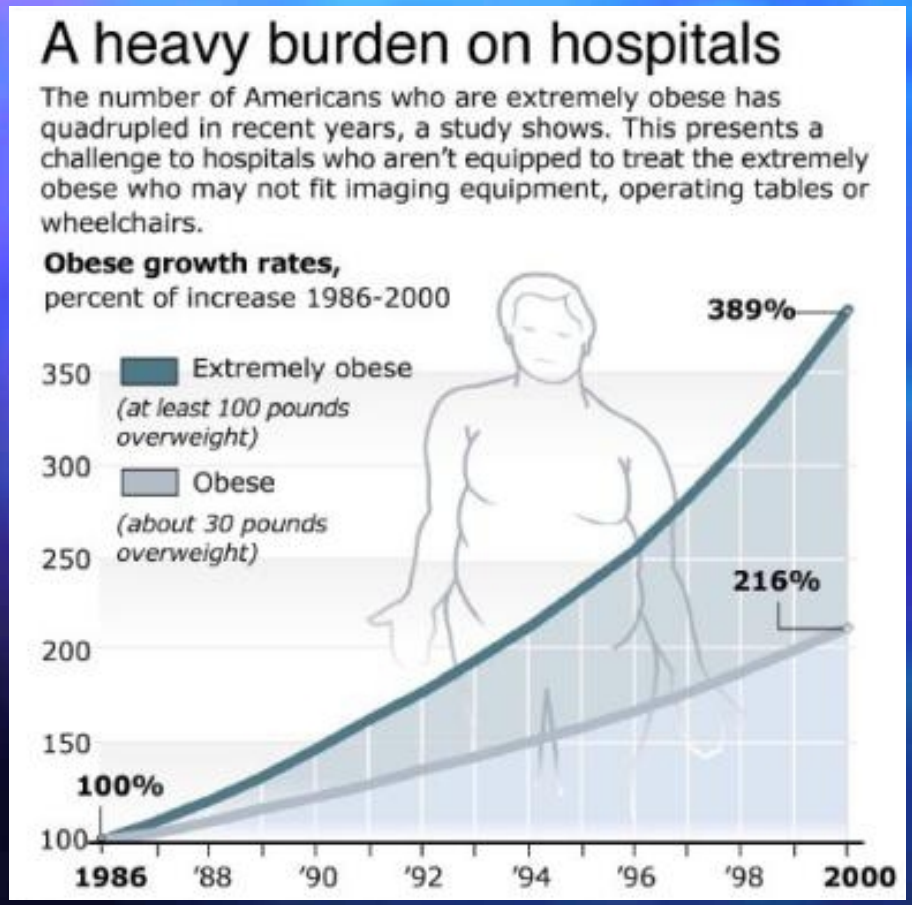
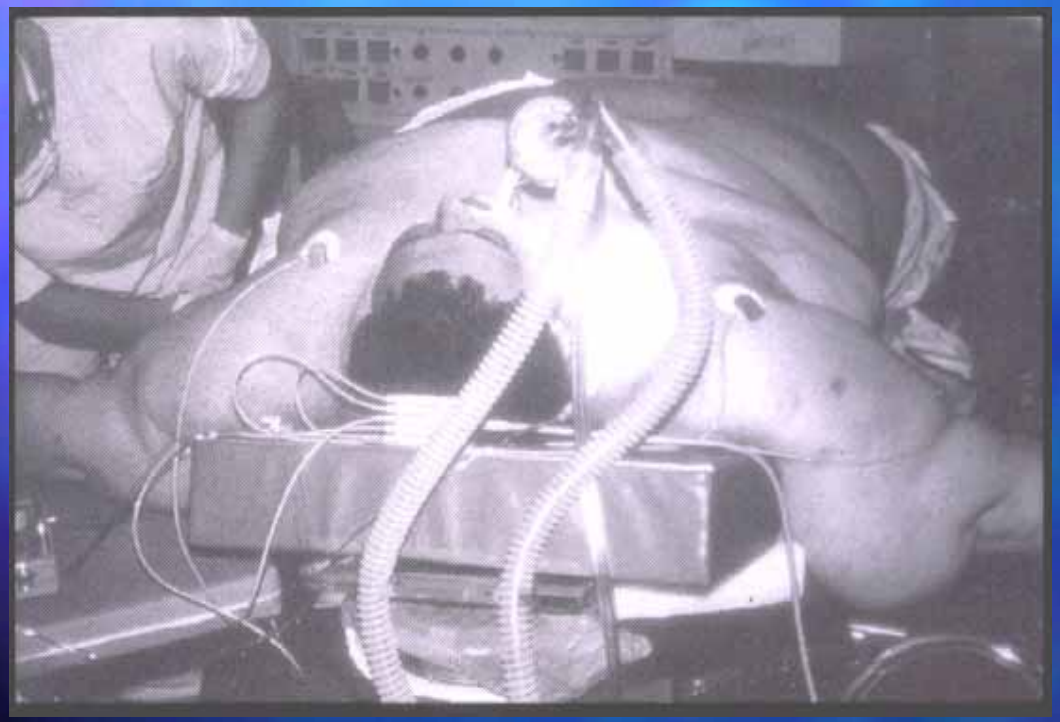
Bariatric Operations

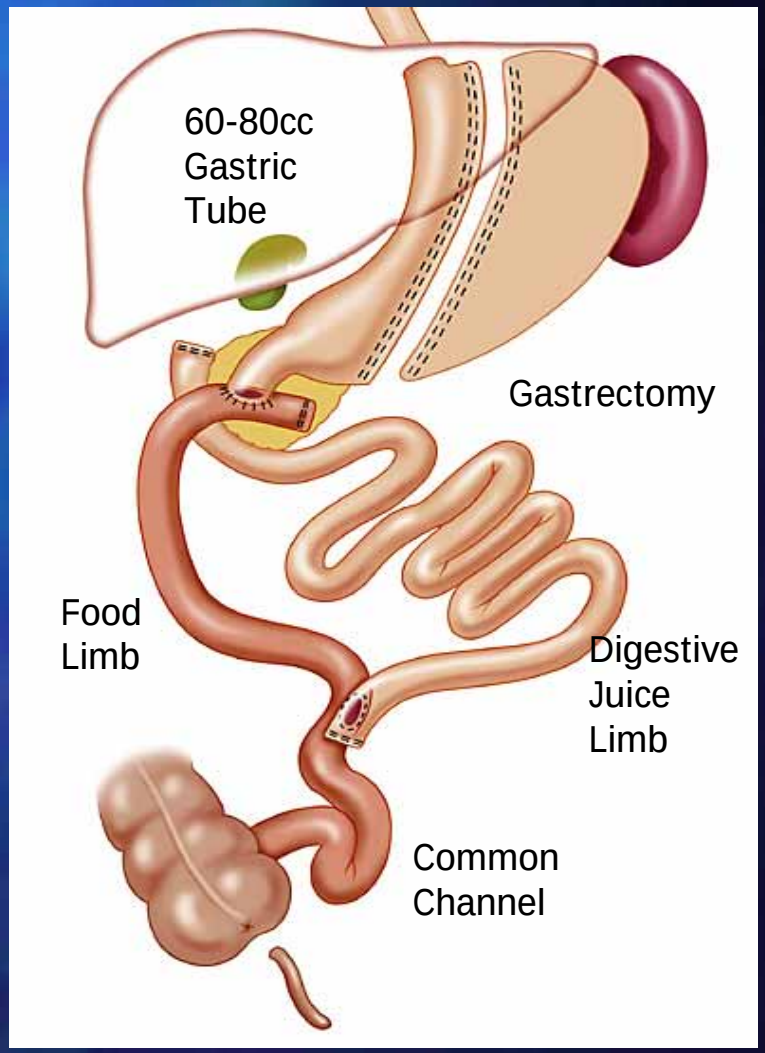


Schematic from the CDC

- Adjustable gastric band placement
- Gastroplasty
- Roux-en-Y gastric bypass
- Biliopancreatic diversion (BPD
- BPD with duodenal switch
  - vertical gastrectomy with duodenal switch

Origin of the Laparoscopic VG:
Operation Needed for the Supermorbidly Obese



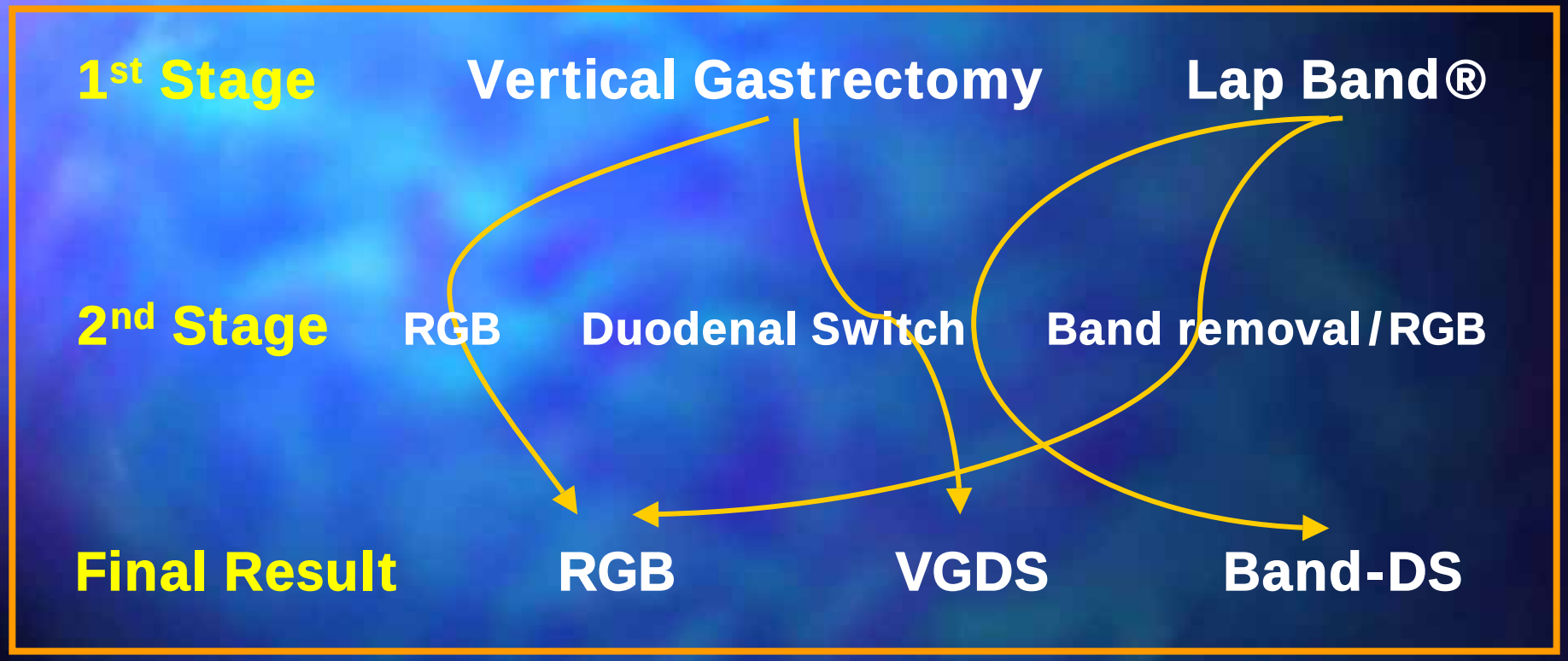


Vertical Gastrectomy & Duodenal Switch

- Morbidity rate of 25-30%

How can we reduce risk, and yet achieve satisfactory weight loss in the supermorbidly obese?

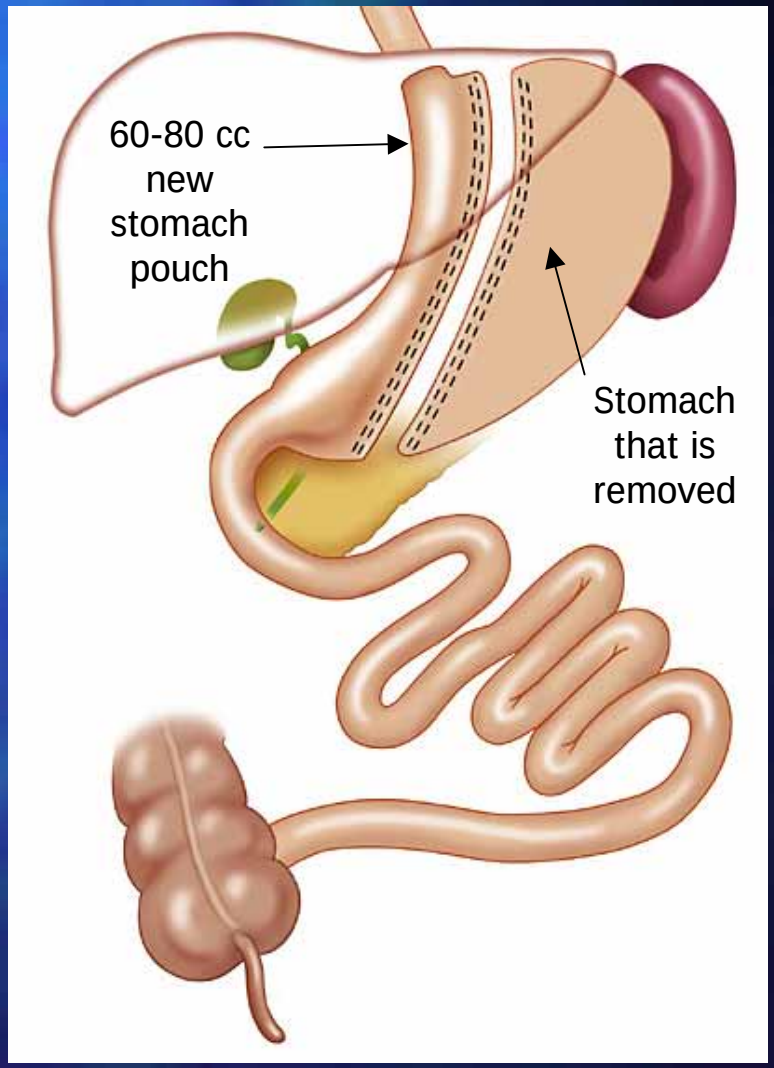
Answer: Staged Procedures



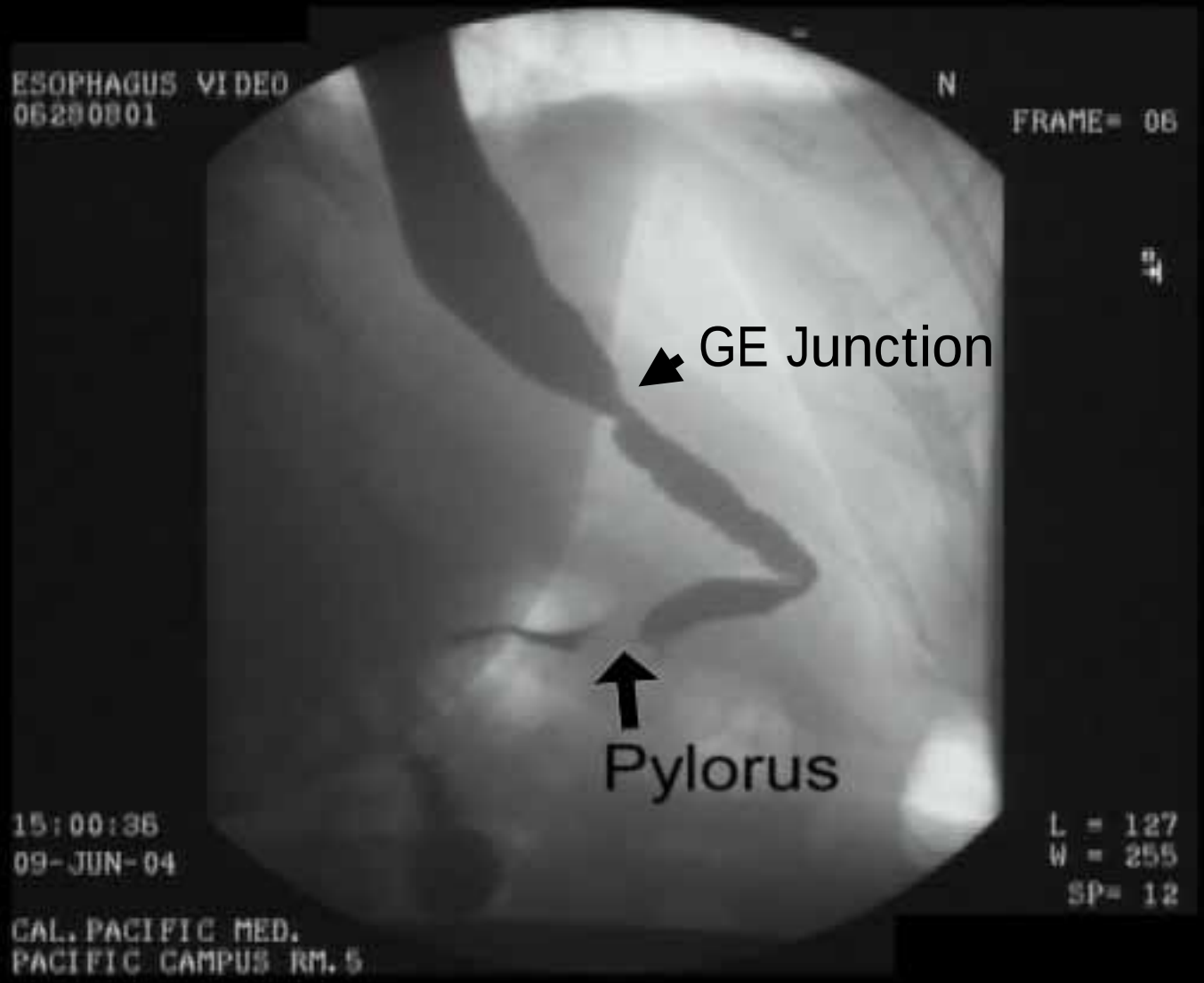
- Advantages:
  - Reduced operative time
  - 2nd stage technically easier after some weight loss

Methods:
Laparoscopic Vertical Gastrectomy

- Starting point 6 cm from pylorus
- Staple along a 32 Fr bougie
- Greater curvature gastrectomy resulting in a 60-80 cc gastric tube
- Methylene blue leak test

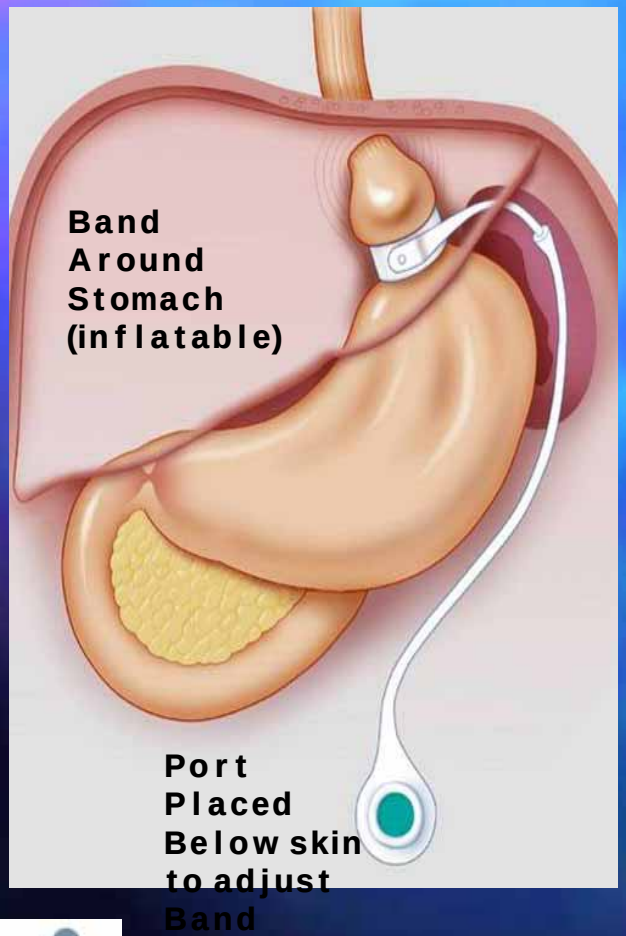


Postoperative Video Esophagram After Laparoscopic Vertical Gastrectomy

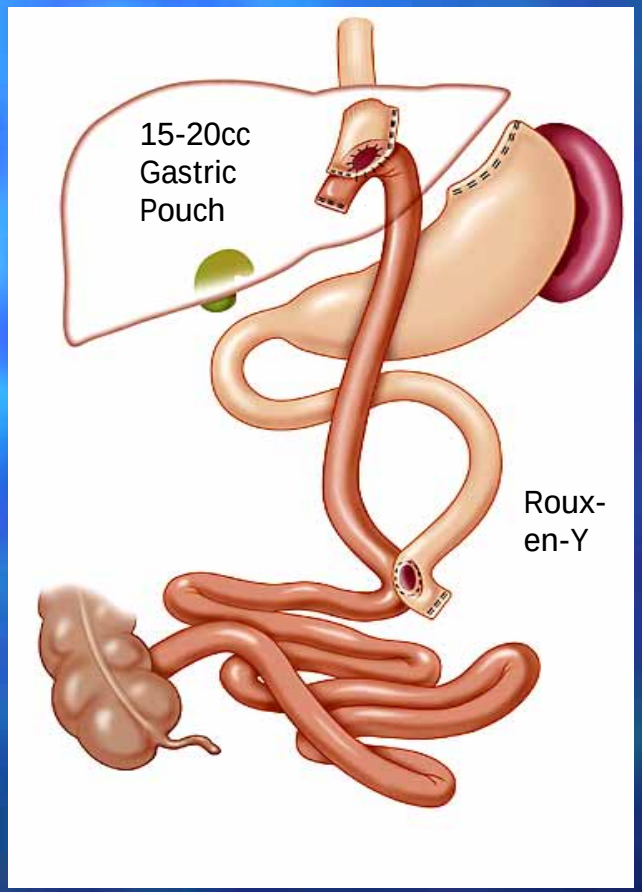


Methods:

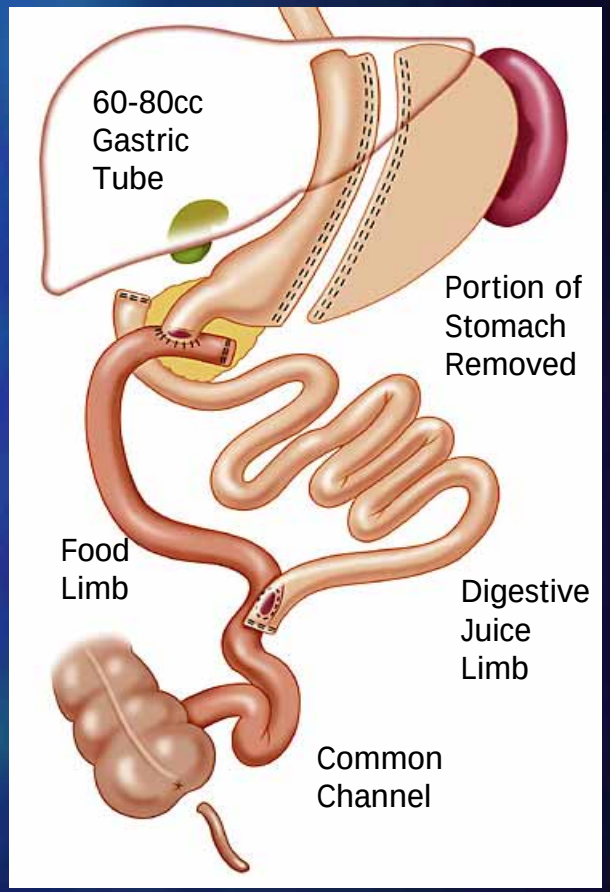
Laparoscopic VG Compared to Band, RGB, DS



Gastric Band



Roux-en-Y Gastric Bypass



Vertical Gastrectomy with Duodenal Switch (Hess)

Comparison:
Laparoscopic VG Compared to Band, RGB, DS

- Retrospective review from Feb 02 - Present
- Compared results of 4 operations

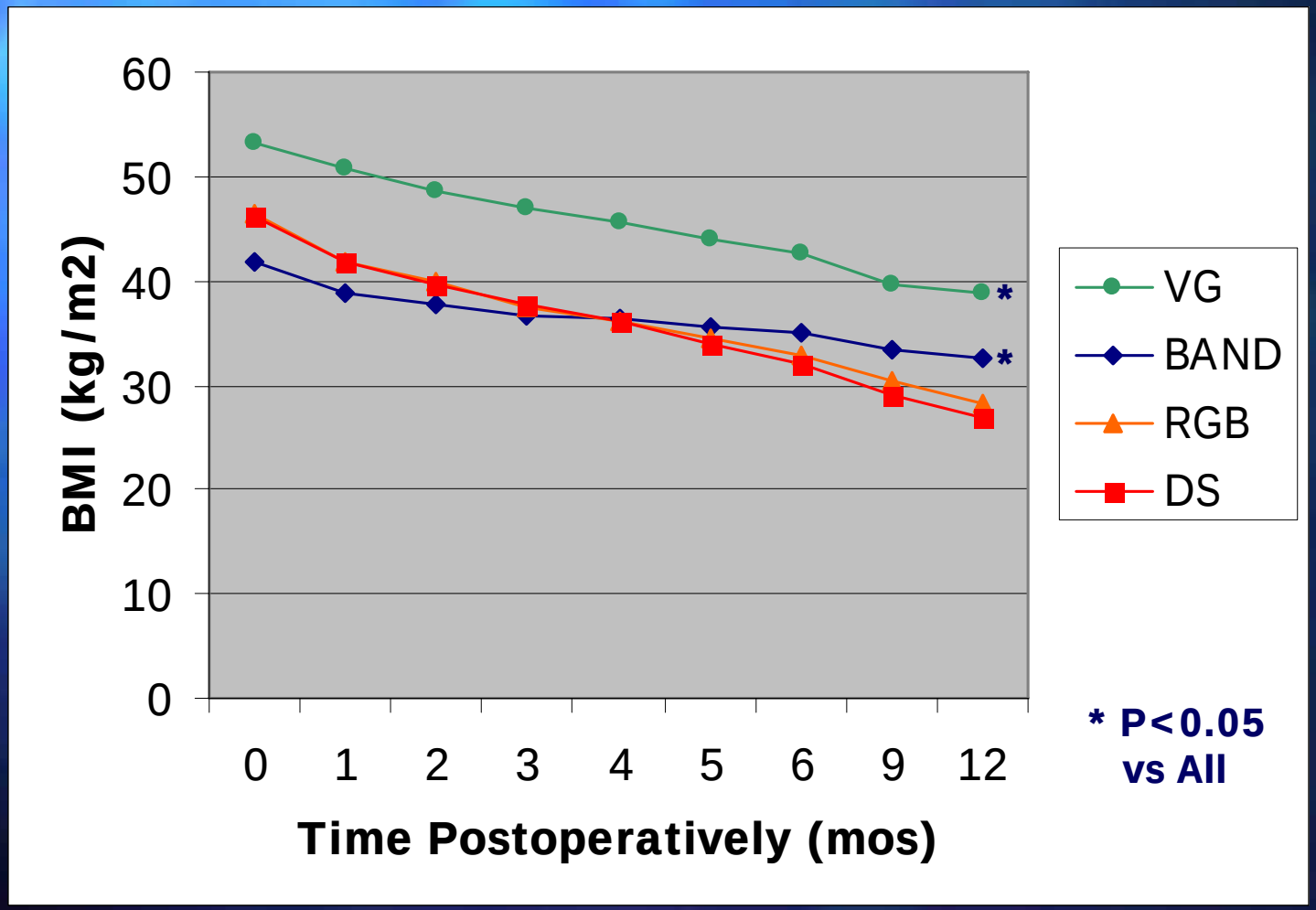
	VG (n=68)	BAND (n=156)	RGB (n=245)	DS (n=66)
Age (yrs)	46 ± 11	41 ± 11	44 ± 10	42 ± 8
Sex (male)	19 (28%)†	16 (10%)	35 (14%)	5 (8%)
OR Time (mins)	102 ± 29‡	92 ± 23‡	142 ± 32	229 ± 43
Conversions	0	0	0	0
Pts. with LOS >5	1 (1.5%)	4 (2.6%)	14 (5.7%)	4 (6.1%)

† P<0.05 versus BAND, RGB, DS

‡ P<0.05 versus RGB, DS

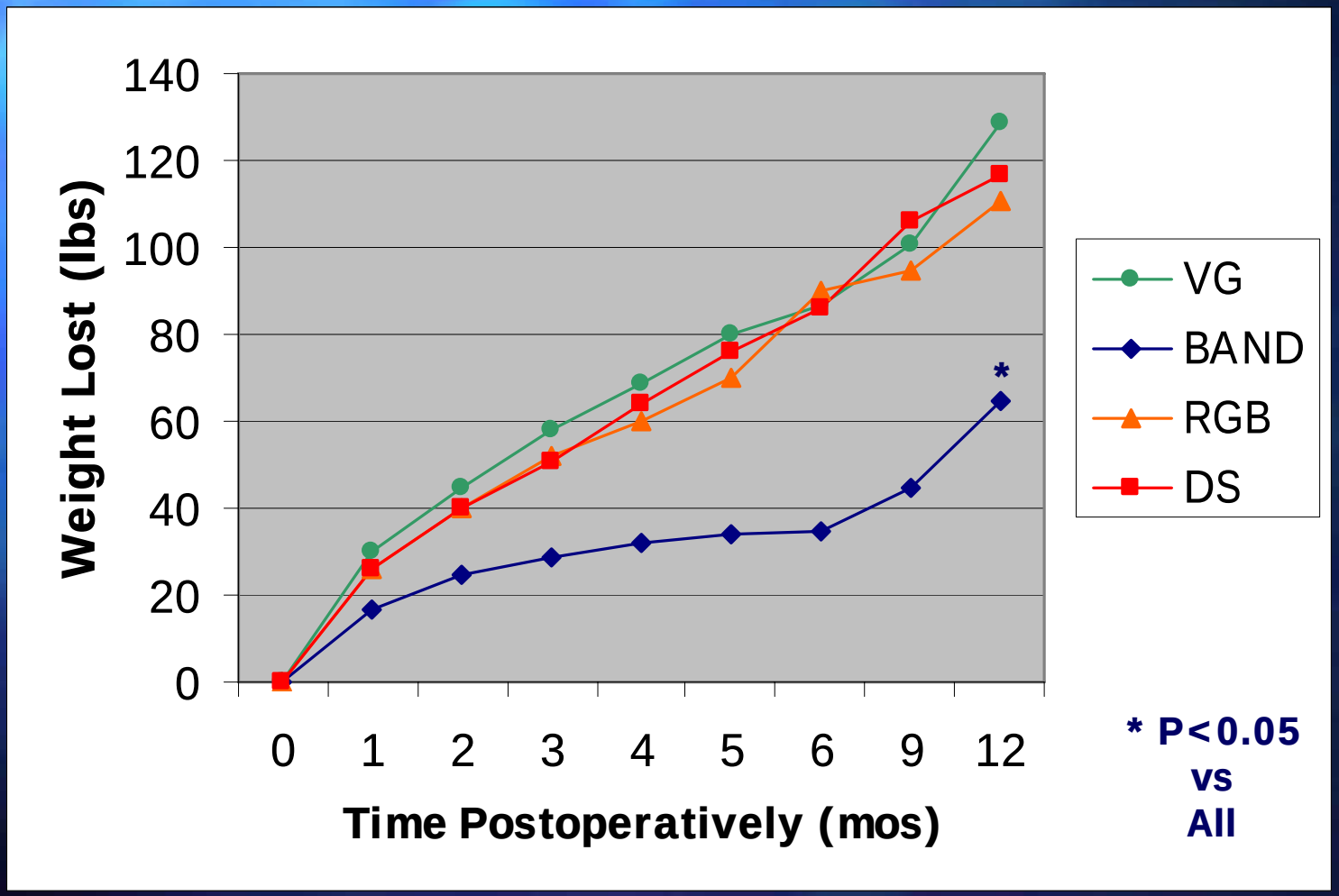
Results: Postoperative BMI

After Laparoscopic Vertical Gastrectomy, Band, Roux-en-Y Gastric Bypass, Duodenal Switch



Results: Weight Lost

After Laparoscopic Vertical Gastrectomy, Band, Roux-en-Y Gastric Bypass, Duodenal Switch



Readmits, Reops, Complications:

After Laparoscopic Vertical Gastrectomy, Band, Roux-en-Y Gastric Bypass, Duodenal Switch

	VG (n=68)	BAND (n=156)	RGB (n=245)	DS (n=66)
Non-op Readmits	1.5%	1.3%	3.3%	6.1%
Reoperations	0†	2.6%	6.4%	16.6%‡
Major Complications	1.5%	2.6%	6.5%	22.7%‡
Total Complications	5.9%†	3.8%†	15.1%	28.8%‡

‡ P<0.05 versus All

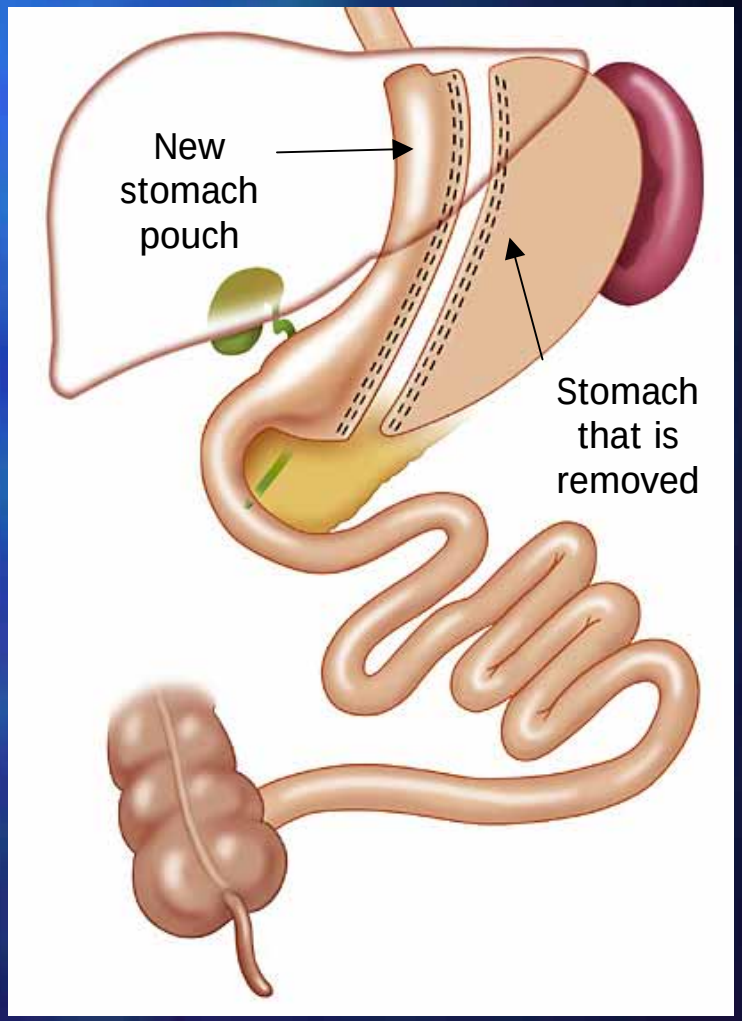
† P<0.05 versus RGB

Summary:
Laparoscopic Vertical Gastrectomy

Compared to RGB, DS:

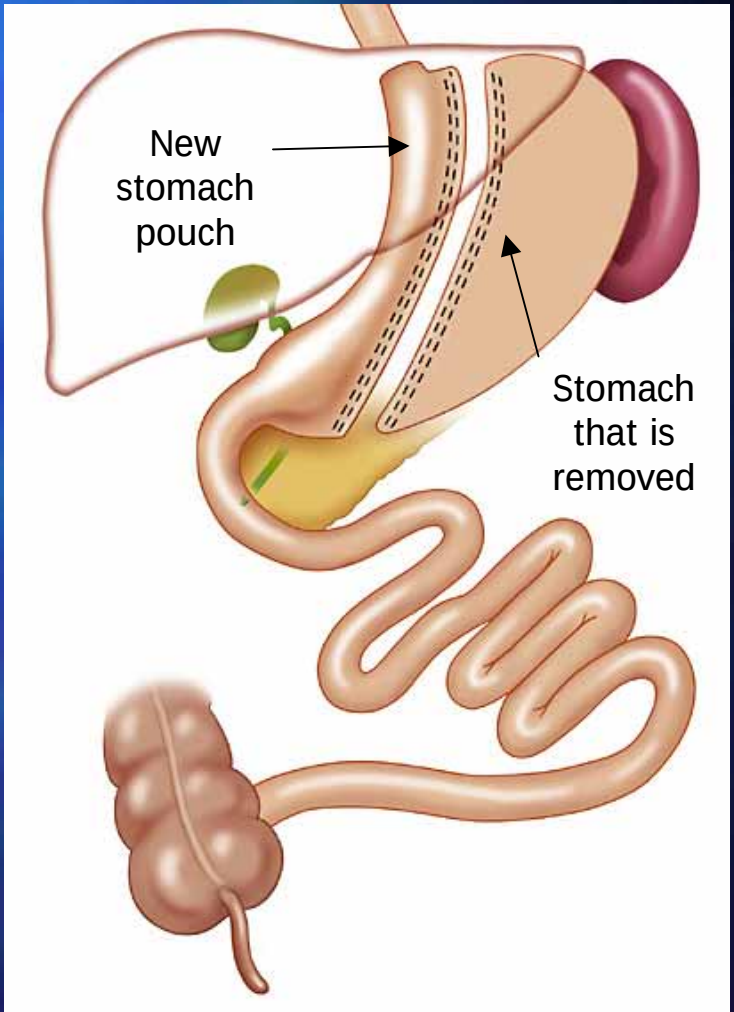
- Purely restrictive, no malabsorption
- Decreased OR time
- Decreased morbidity, 0% mortality in high risk group
- Similar weight loss
- Safe 1st step procedure in superobese and/or high-risk patients

But...



Unanswered Questions:
Laparoscopic Vertical Gastrectomy

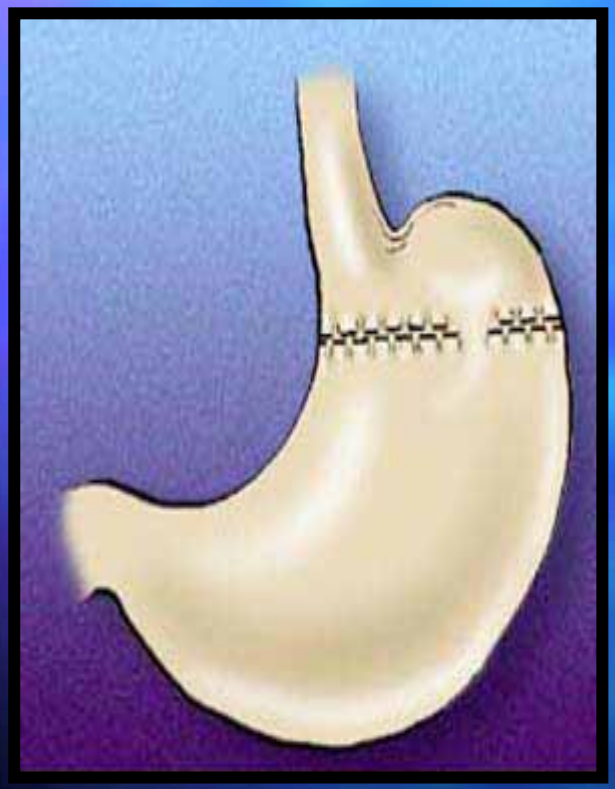
- Durability?
- Second stage?
  - Necessary?
  - Timing
  - What operation?
- Mechanism?



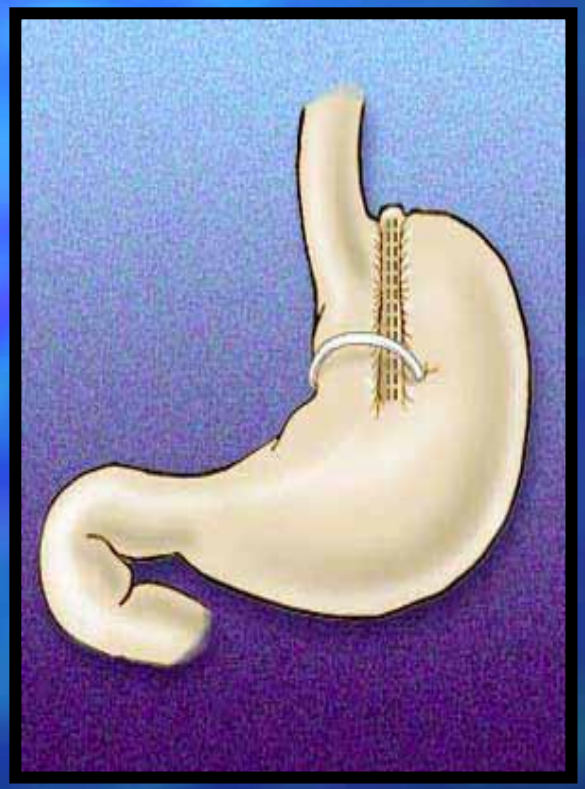
Illustrations from the American Society for Bariatric Surgery

Durability?

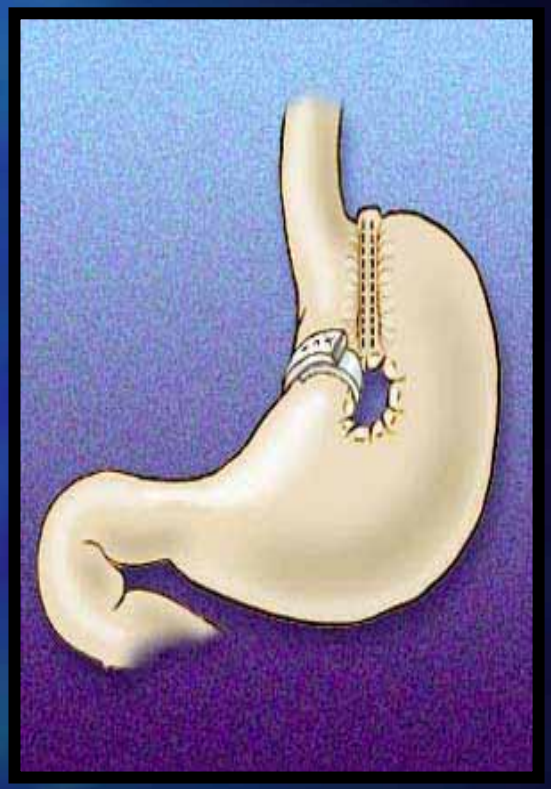
Gastroplasty: Inadequate Long-Term Weight Loss



Horizontal Gastroplasty

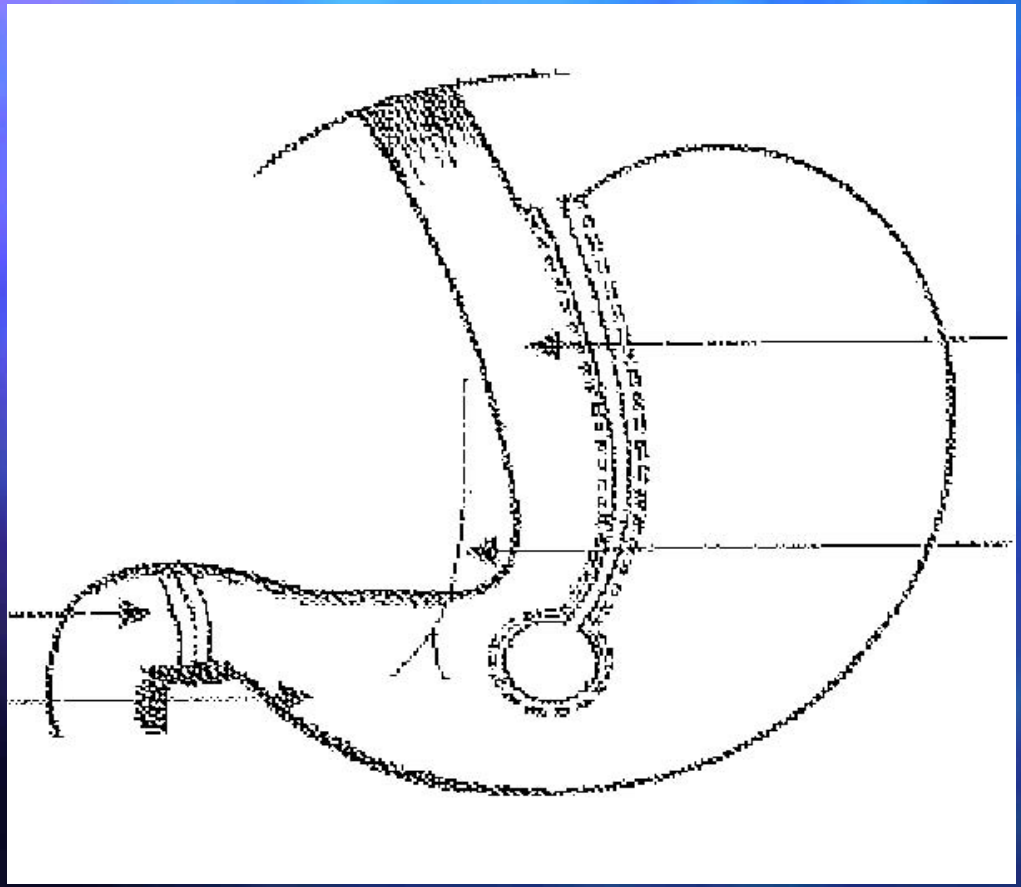


Slilastic Ring Vertical Banded Gastroplasty



Vertical Banded Gastroplasty (Mason)

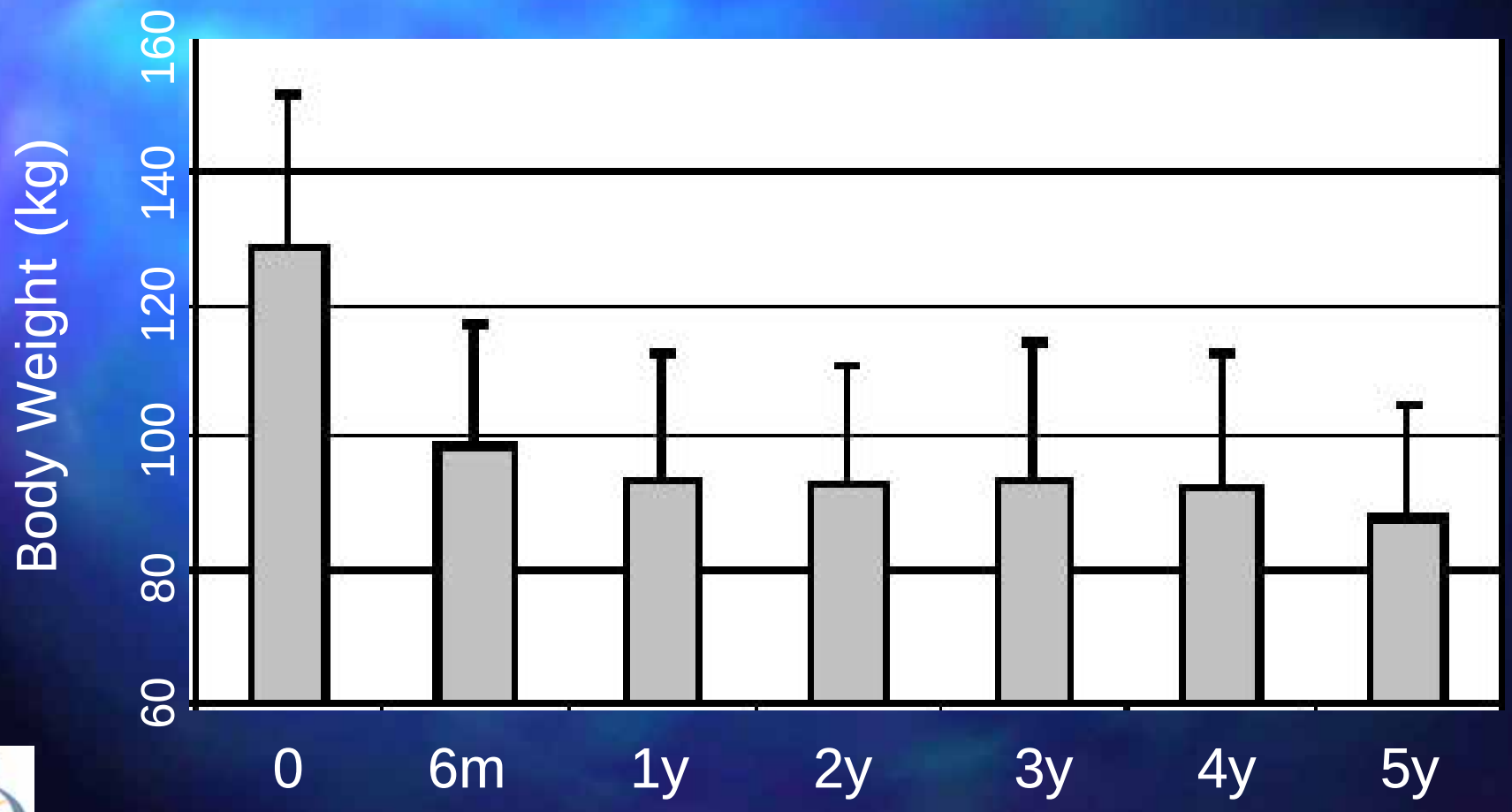
Durability?
Similar operation - Magenstrasse & Mill



- 1987 – David Johnston, Leeds, UK
- 230 patients
- 4% major complications
- 0% mortality

Durability?

Magenstrasse & Mill operation – 5 year follow-up



Importance of Bougie Size

Study	No. Pts.	%EWL Loss
Voellinger (Gagner) 2002 60 Fr bougie	24	23% at 3 m 32% at 6 m
Elariny 2002 60 Fr bougie	30	20lbs at 1m
Crookes 2003 48Fr bougie, open	14	47% at 1 y
Cottam (Schauer) 2003 48Fr bougie, lap	102	46% at 1 y
Johnston 2003 M&M, 32 Fr bougie, open	230	63% at 1 yr
Adamo 2003 32 Fr bougie, open/lap	25 VG 6 M&M	63% at 1 yr 73% at 18m
Lee 2004 32 Fr bougie	68	44% at 6 m 55% at 1 y

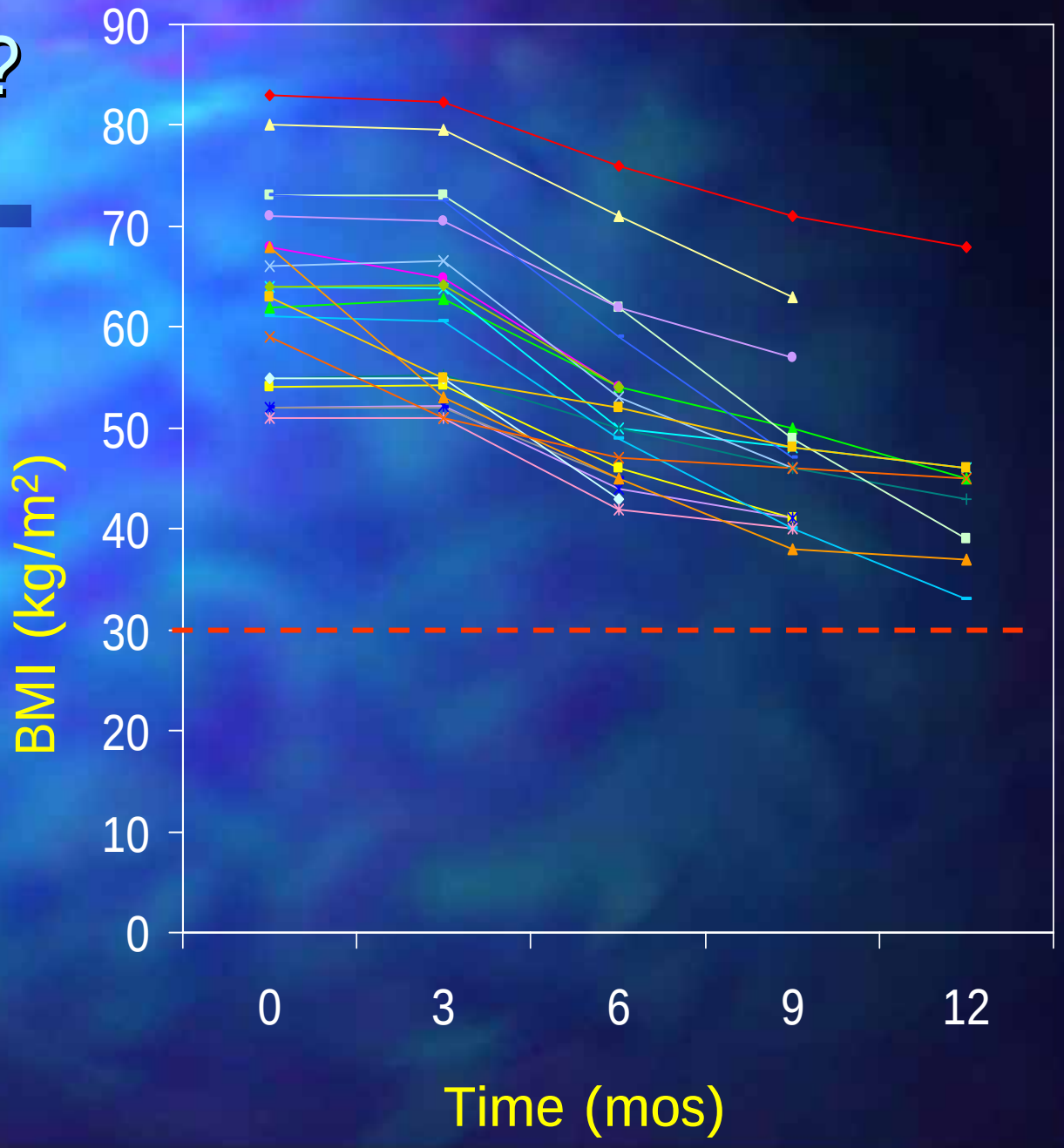
Second Stage?

Is it Necessary? If so, when? What?

1st Stage	Vertical Gastrectomy		Lap Band®
2nd Stage	RGB	Duodenal Switch	Band removal / RGB
Final Result	RGB	VGDS	Band-DS

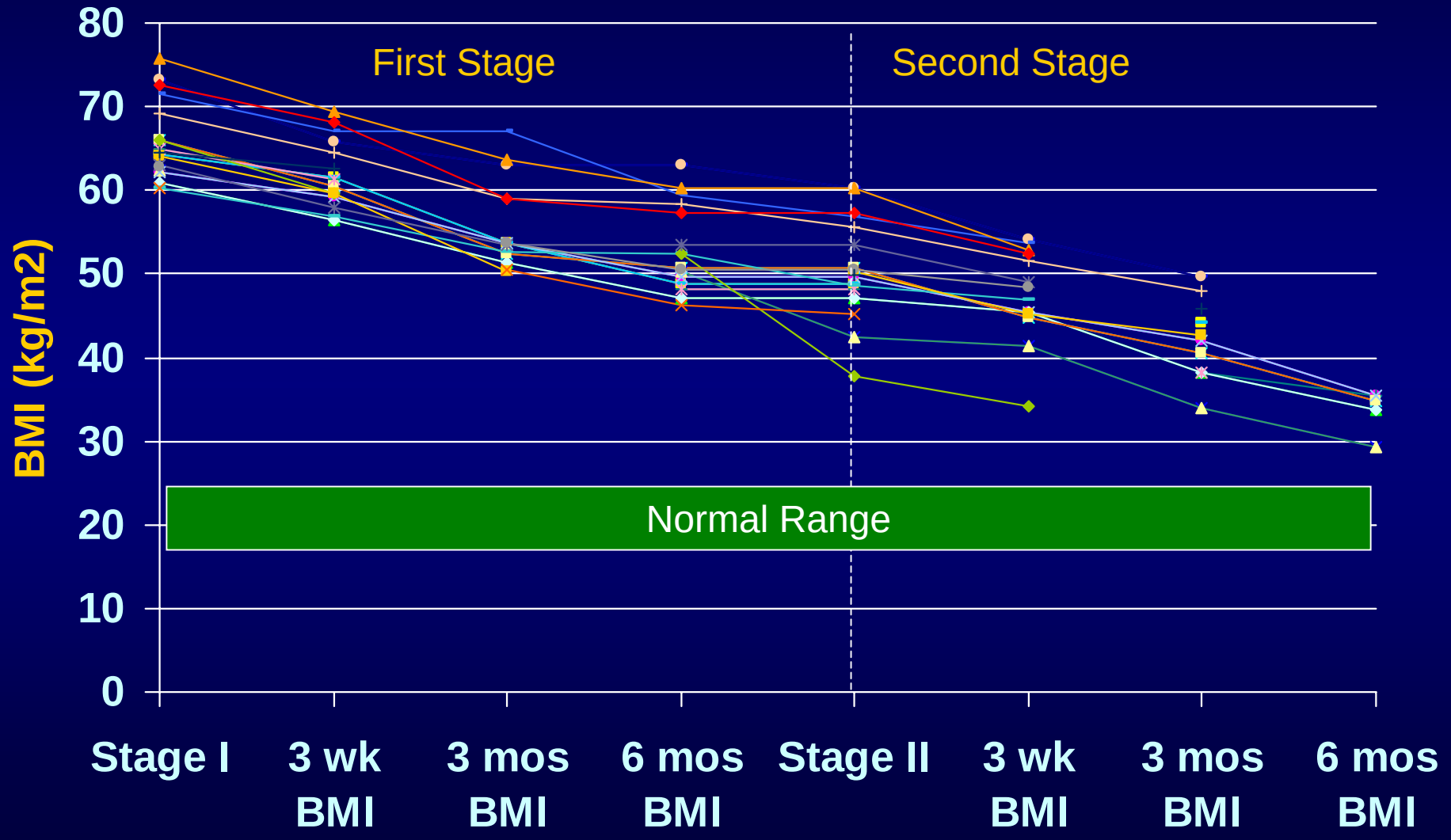
Second Stage? Is it Necessary?

BMI Decrease In Individual Patients After VG With Initial **BMI >50**



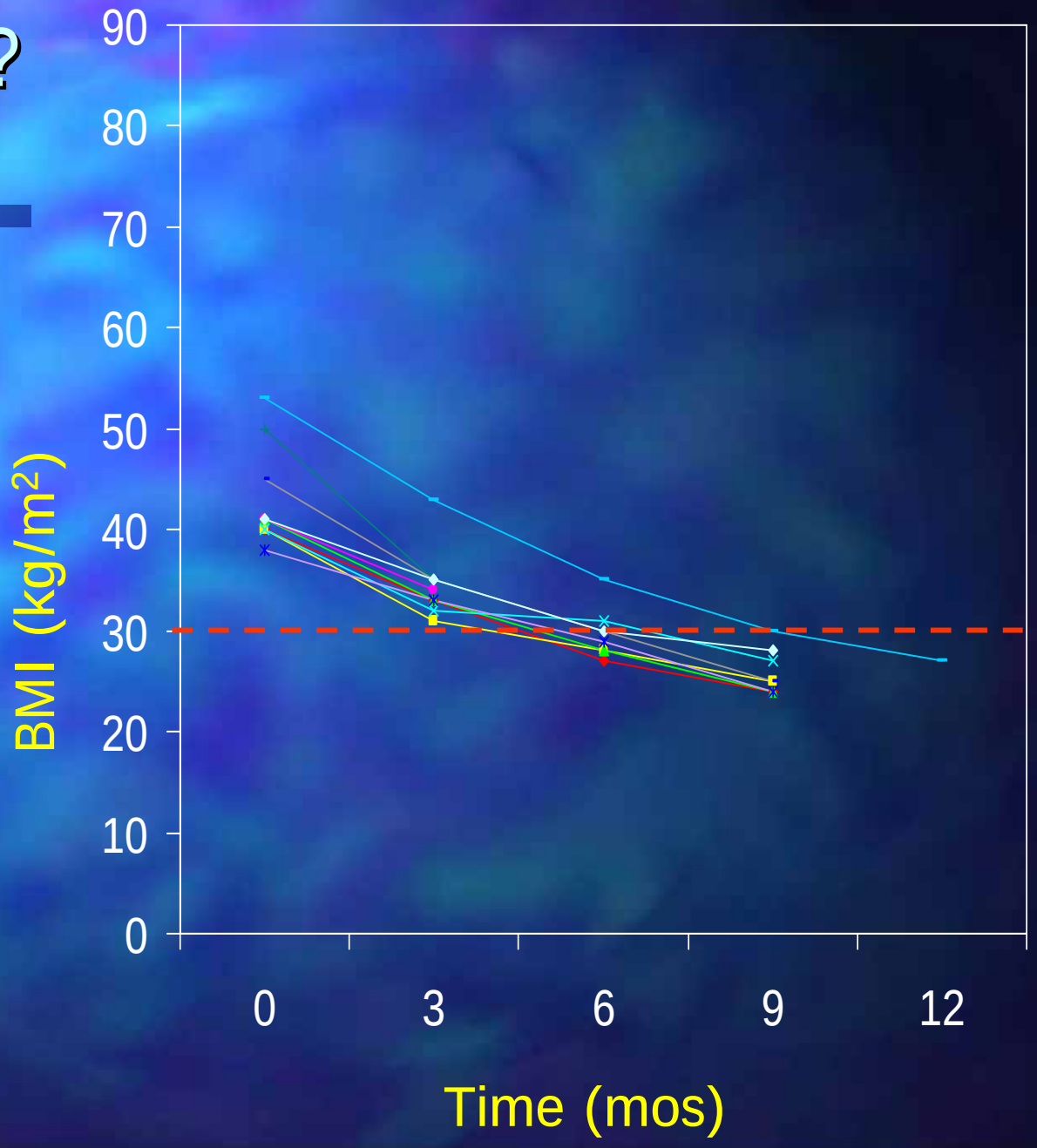
Two-Stage Laparoscopic DS Weight Change based on BMI

From Chu, Gagner et al

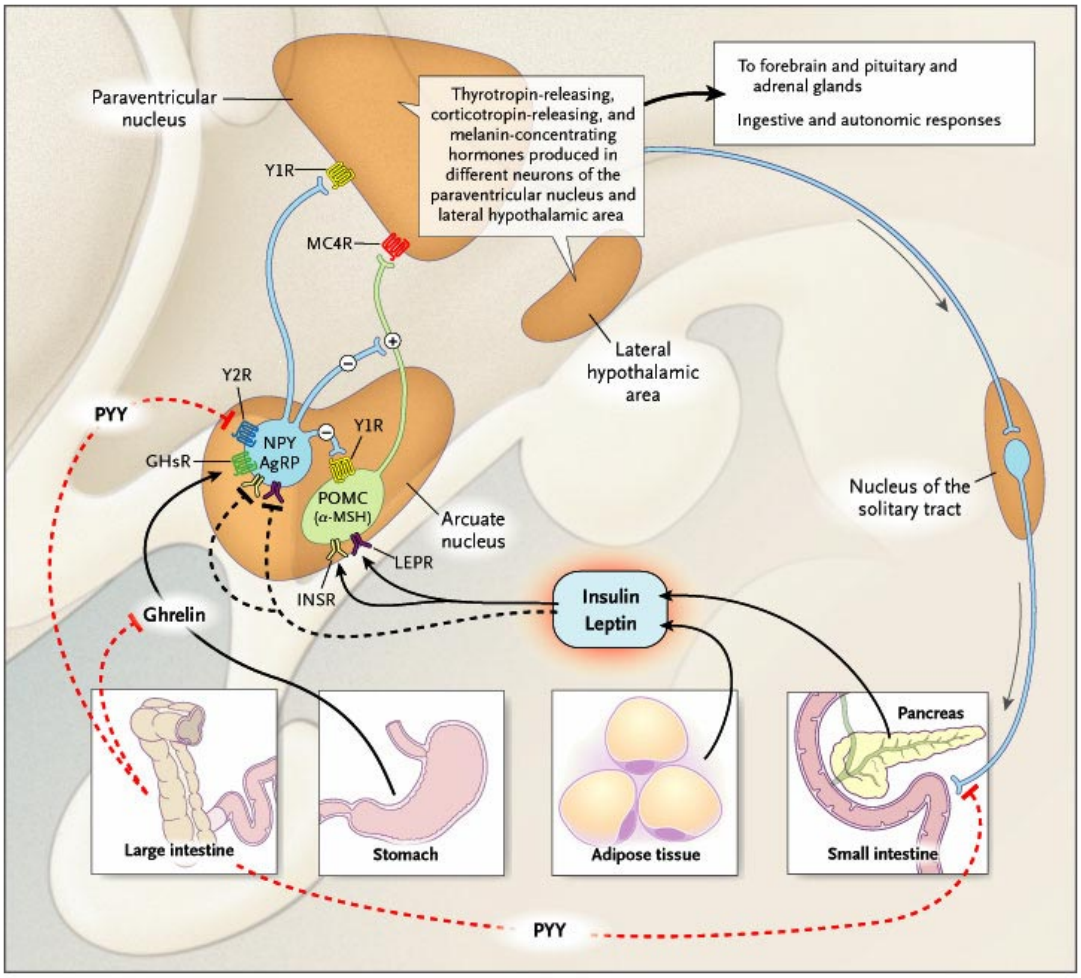


Second Stage?
Is it Necessary?

BMI Decrease In Individual Patients After VG With Initial **BMI <50**



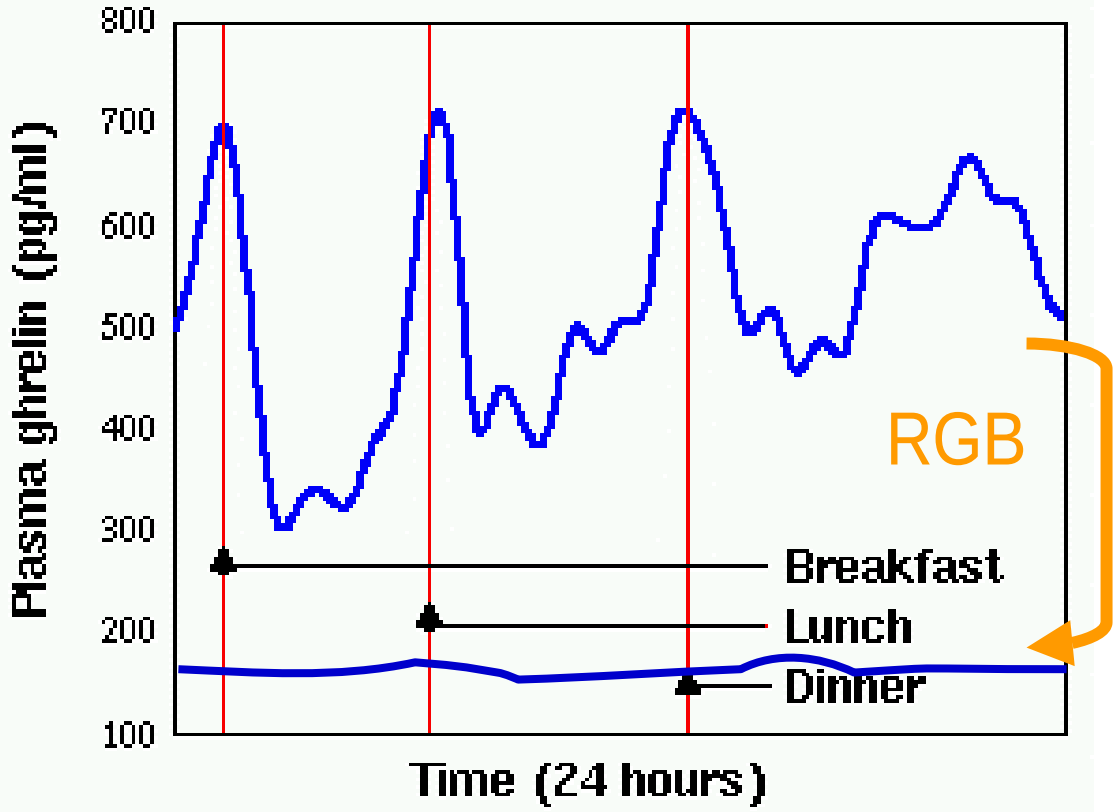
Mechanism?
Hormonal Control of Weight Homeostasis



- Ghrelin
- Insulin
- Leptin
- PYY

Mechanism?

Ghrelin Controls Energy Balance, and Appetite after RGB

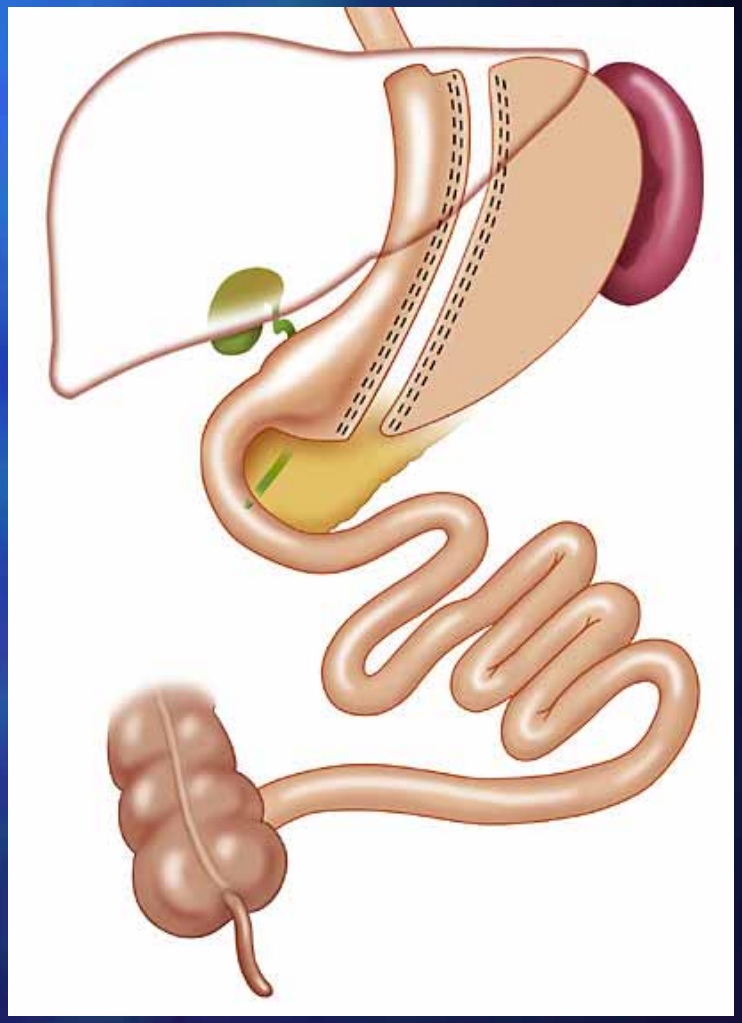


Adapted from Cummings et al. Diabetes 50:1714, 2001.

- Mechanism after VG?
  - Ghrelin?
    - Fundus gone
    - No hunger
  - Other hormones
  - Dystmotility?

Long-term Results?
Predictions for the Laparoscopic VG

- Durability - promising
  - Smaller bougie better weight loss
- Second stage
  - Not necessary if BMI<45
  - Timing & operation – further study needed
- Mechanism
  - Further study needed
- Insurance participation



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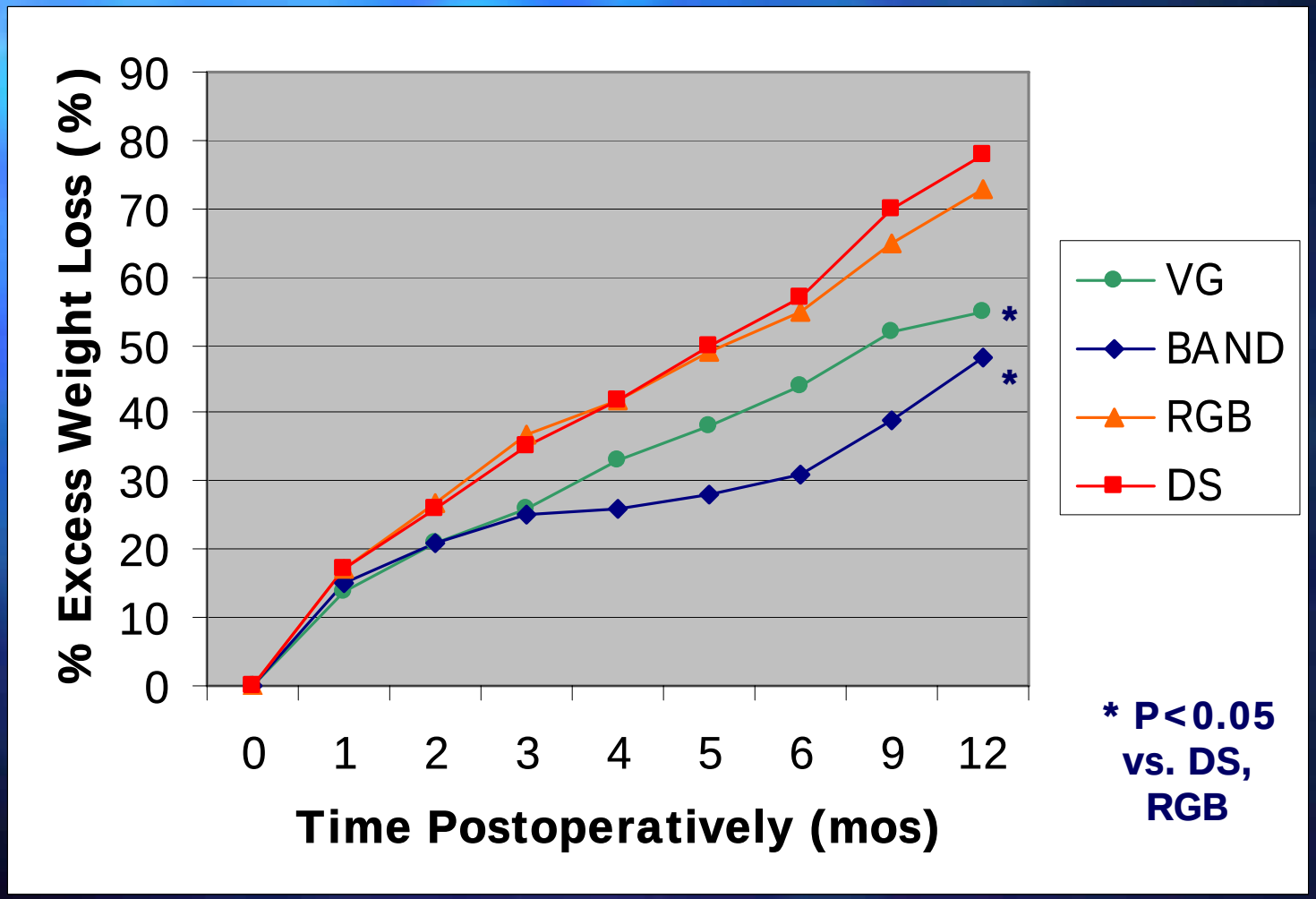
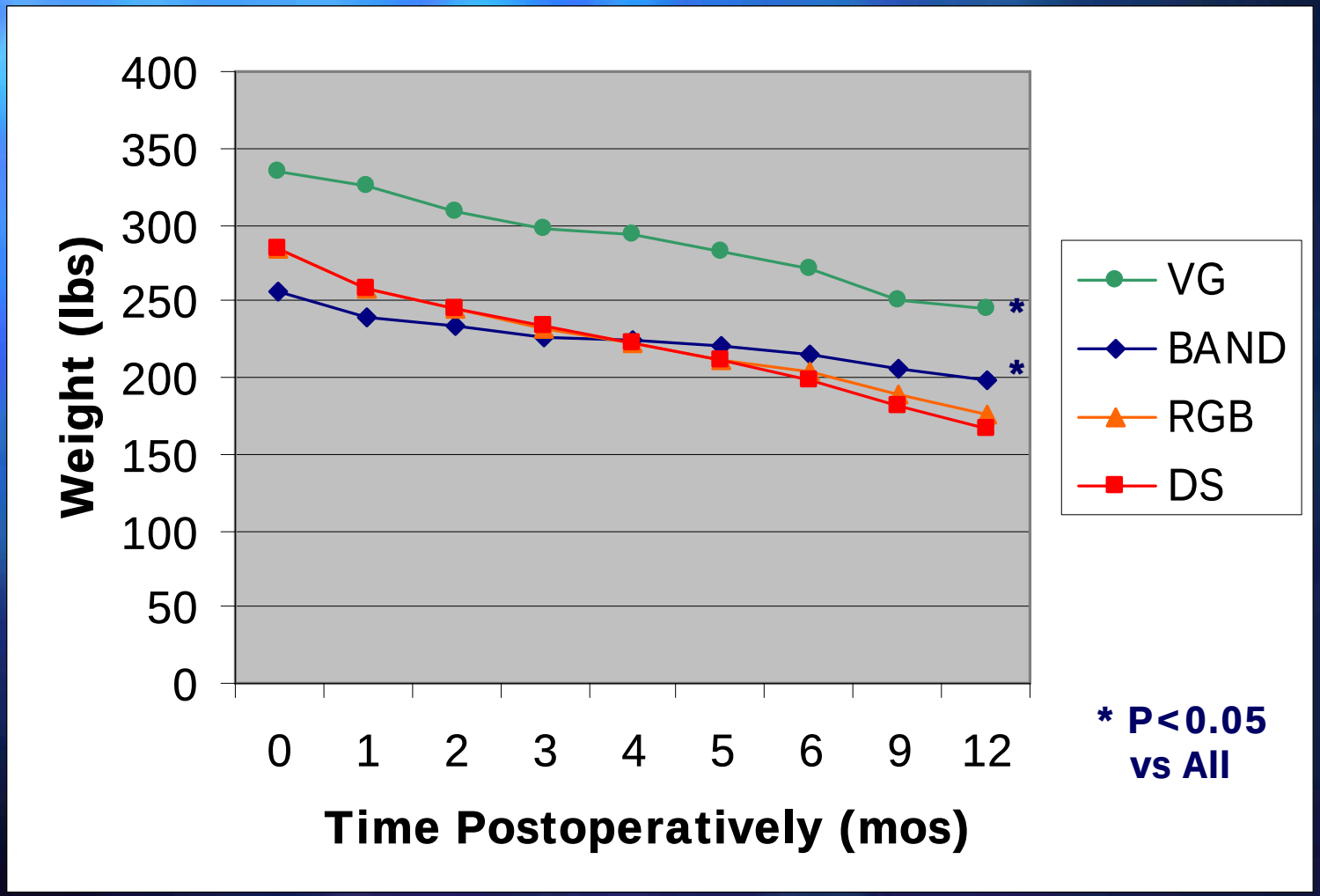
Results: % Excess Weight Loss

After Laparoscopic Vertical Gastrectomy, Band, Roux-en-Y Gastric Bypass, Duodenal Switch



Results: Postoperative Weight

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