

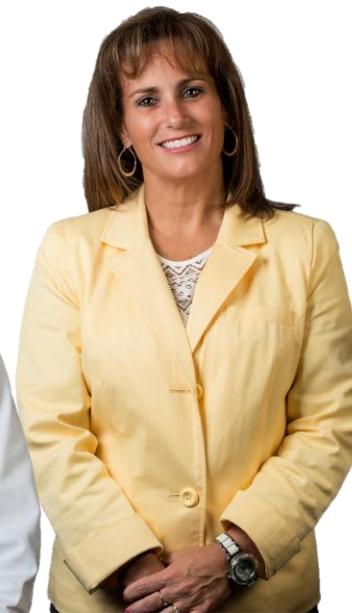
# Bariatric and Metabolic Surgery

## Orientation

*Jesse Gutnick MD,  
Assistant Professor of Surgery*



# The Team



# The Team

- **3 Bariatric Surgeons / 1 General surgeon**
- **2 NP's**
- **2 Bariatric PA's**
- **1 Bariatric Coordinator**
- **2 Nutritionists**
- **1 Medical Director**
- **1 Practice Manager**
- **3 Bariatric Nurses**
- **2 Full time Insurance Specialists**
- **3 Office Clerks**
- **1 Assistant**
- **1 Surgical Clinical Reviewer**



# Obesity is common, serious, and costly

- The prevalence of obesity was 39.8% and affected about 93.3 million of US adults in 2015-2016.
- Obesity-related conditions include heart disease, stroke, type 2 diabetes and certain types of cancer that are some of the leading causes of preventable, premature death.
- The estimated annual medical cost of obesity in the United States was \$147 billion in 2008 US dollars; the medical cost for people who have obesity was \$1,429 higher than those of normal weight.



# What is Obesity?

# The Obesity Medicine Association's Definition of Obesity

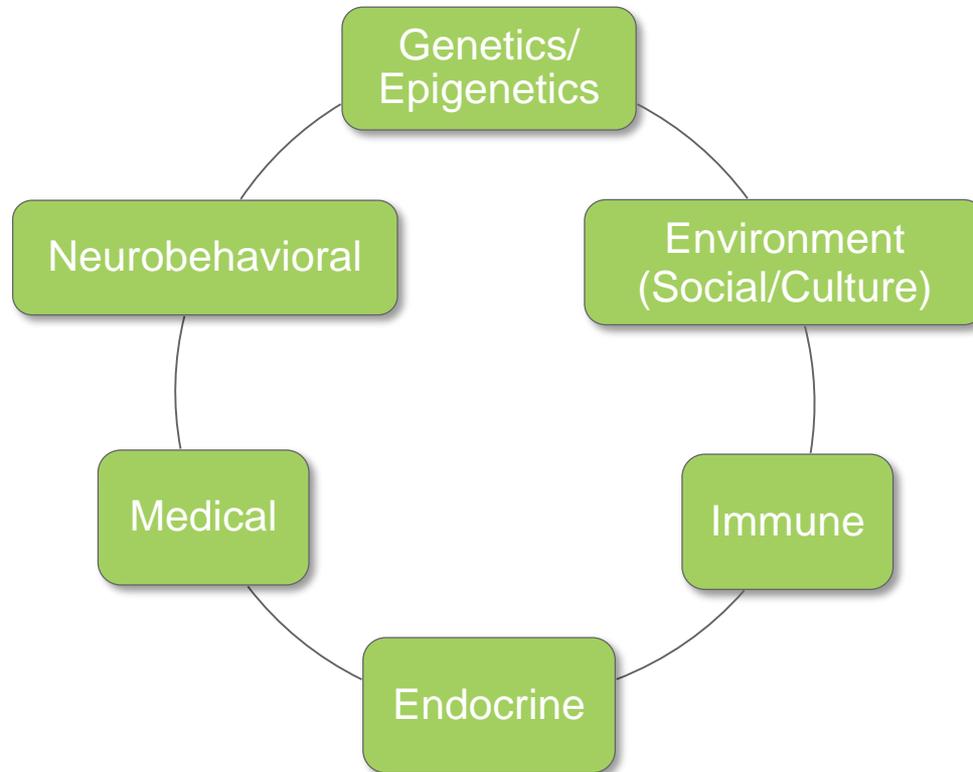
- “Obesity is defined as a chronic, relapsing, multi-factorial, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences.”

Obesity Algorithm®. ©2017-2018 Obesity Medicine Association.

# Obesity affects your life...

- **Life-long**
- **Progressive**
- **Life-threatening**
- **Genetically-related**
- **Costly**
- **Multi-factorial**

# Obesity as a Multifactorial Disease

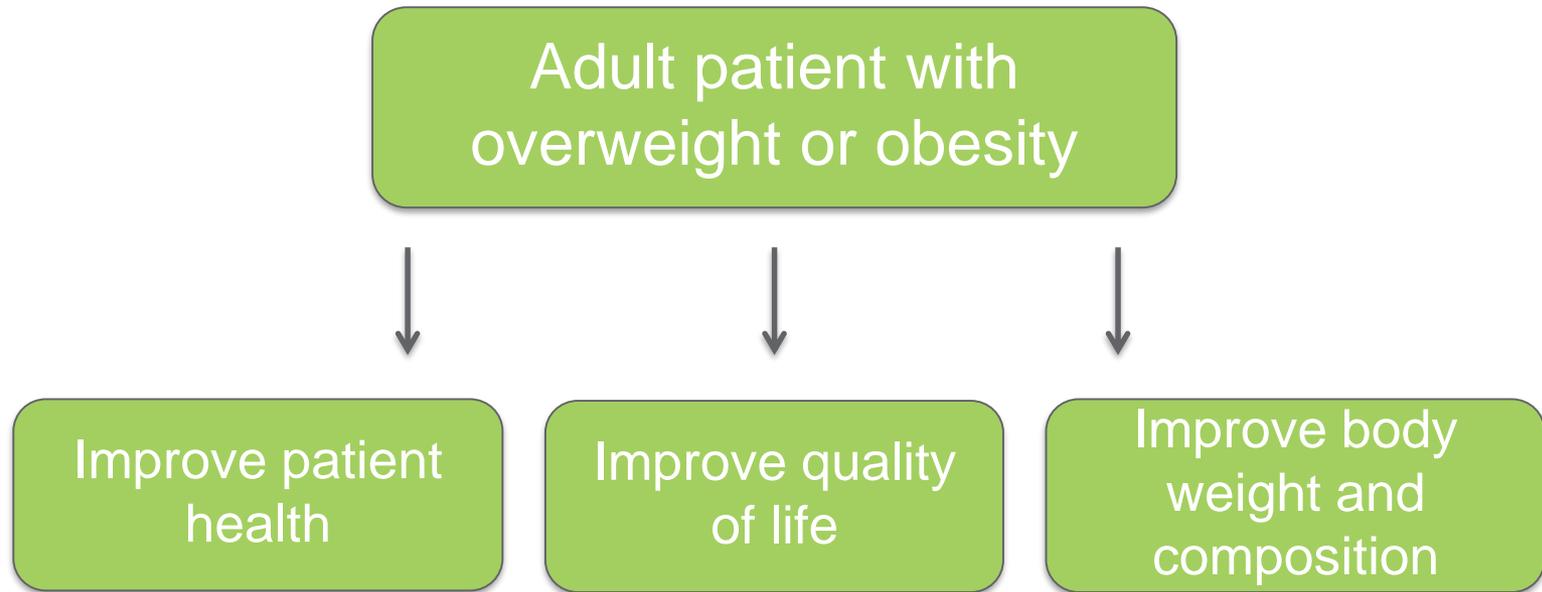


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# Obesity Kills

- **Leading cause of preventable death**
- **Recently surpassed smoking as leading cause**
- **Lifespan shortened 9 - 12 years**
- **Over 400,000 deaths per year**
- **46 deaths each hour**

# Overall Management Goals



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# Who is Obese?

**Body Mass Index (BMI)**

**What is BMI?**

$$\text{BMI} = \text{weight (kg)/height (m}^2\text{)}$$
$$= [\text{weight (lbs)/height (in}^2\text{)}] \times 703$$

<b>Acceptable Weight</b>	<b>18 – 25</b>
<b>Overweight</b>	<b>25 – 30</b>
<b>Obese</b>	<b>30 – 35</b>
<b>Severe Obesity</b>	<b>35 – 40</b>
<b>Morbid Obesity</b>	<b>40 – 50</b>
<b>Super Morbid Obesity</b>	<b>above 50</b>

# Body Mass Index: Increase Body Fat (Adiposity)

Body mass index (BMI) in kilograms per meters squared ( $\text{kg}/\text{m}^2$ )\*

**Normal Weight**  
18.5-24.9

**Overweight**  
25.0-29.9

**Class I Obesity**  
30.0-34.9

**Class II Obesity**  
35.0-39.9

**Class III Obesity**  
 $\geq 40$

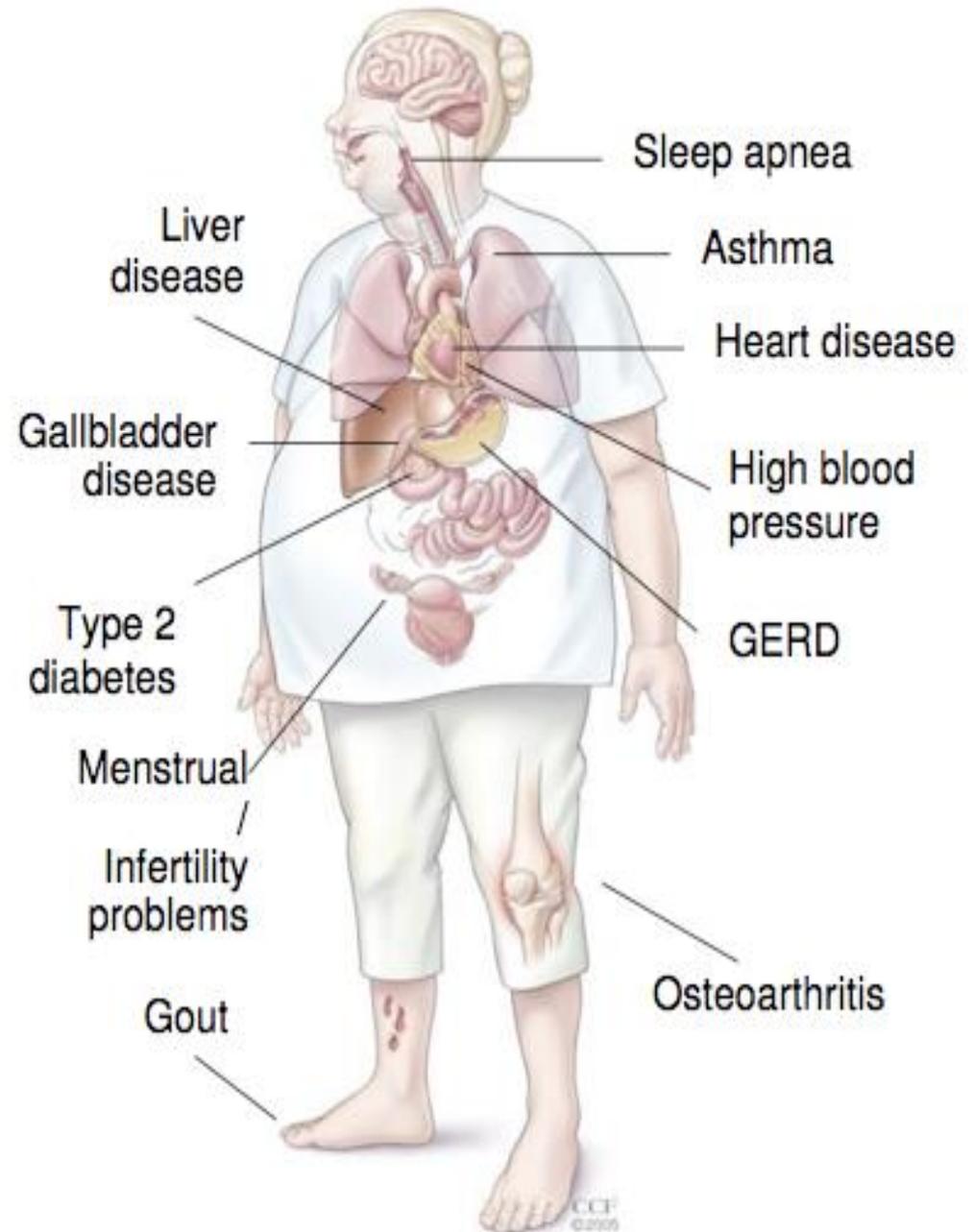
\*Different BMI cut-off points may be more appropriate based upon gender, race, ethnicity, and menopausal status

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# Indications for Surgery

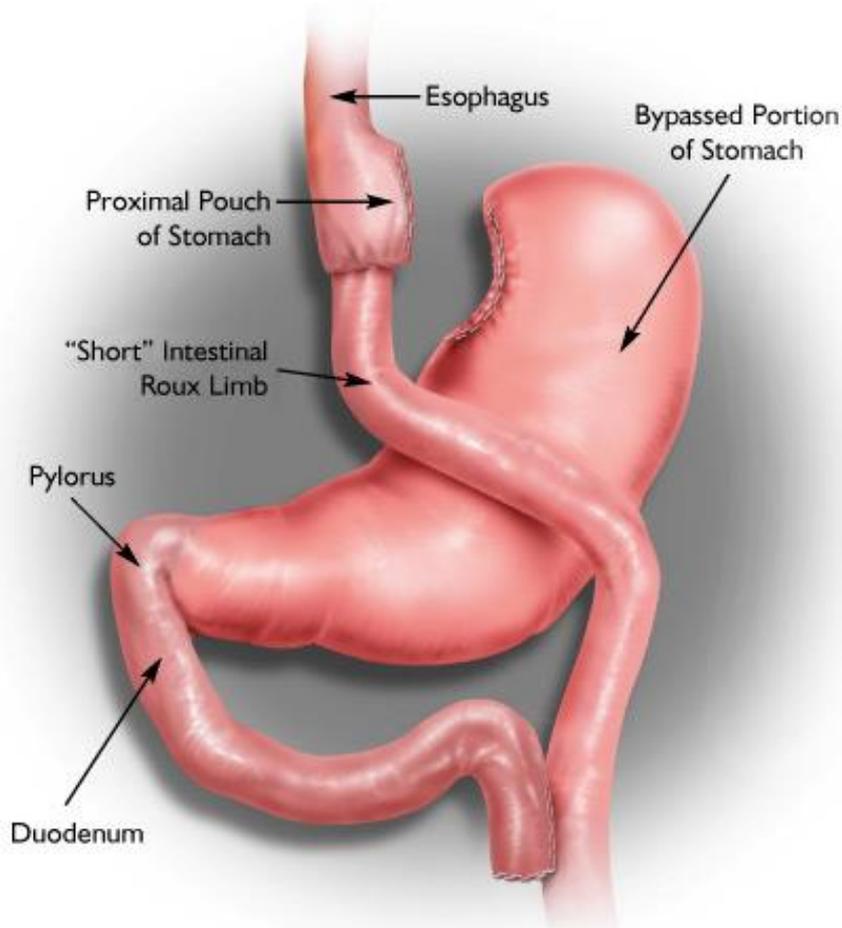
- **BMI 40 or greater**
- **BMI 35 -40 with co-morbidities**
- **Patient must be an acceptable operative risk**
- **Patient must be motivated and demonstrates the ability to understand and participate in the program**
- **Patient must be dedicated to a major lifestyle change and long-term follow-up**
- **Consensus after bariatric team evaluation (Surgeon, Psychologist, Dietitian, etc.)**

# Obesity is a Metabolic Disease



# Roux-en-Y Gastric Bypass

Roux-en-Y Gastric Bypass

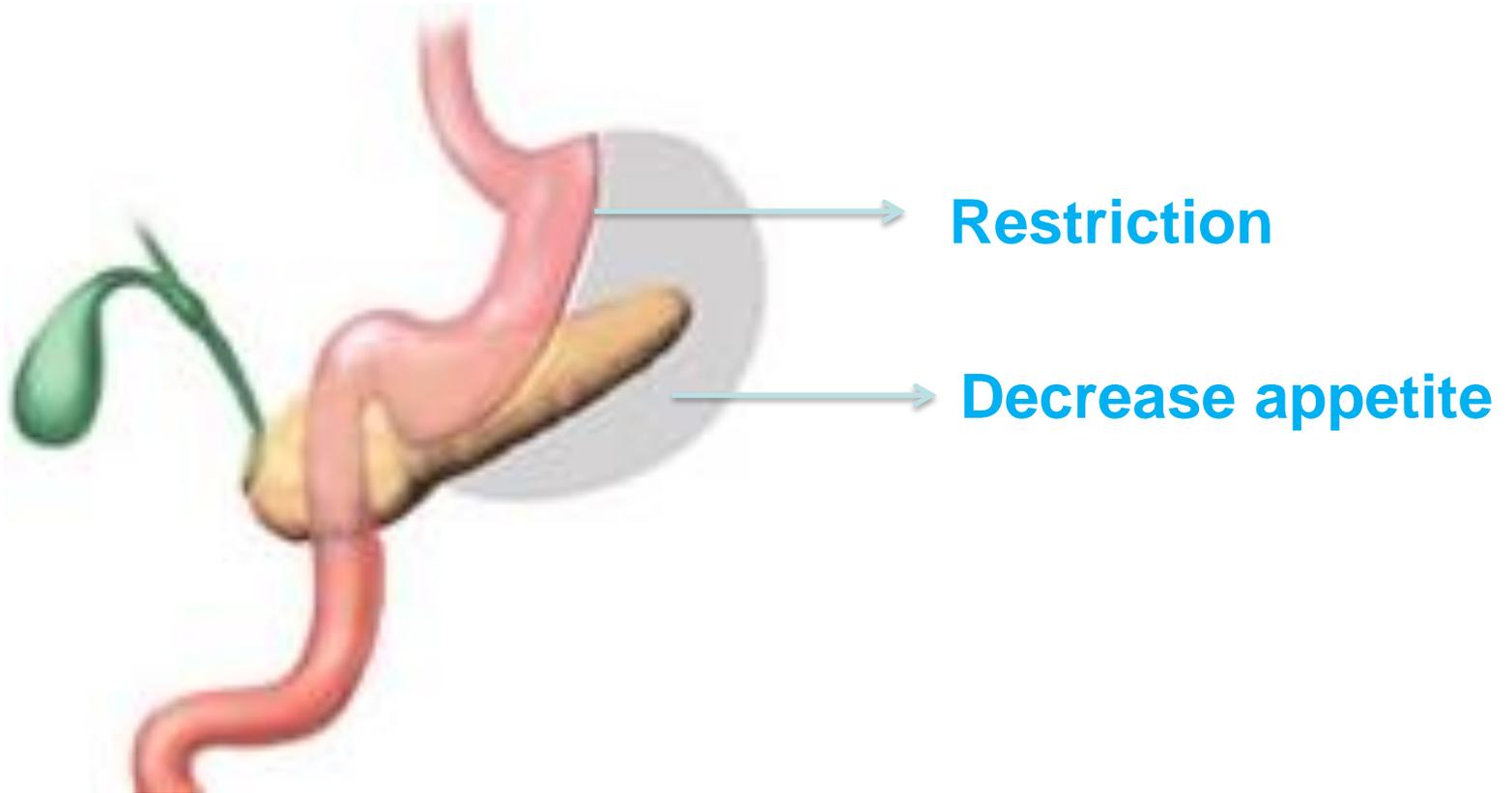


Source: Kolanowski, 1997 ©

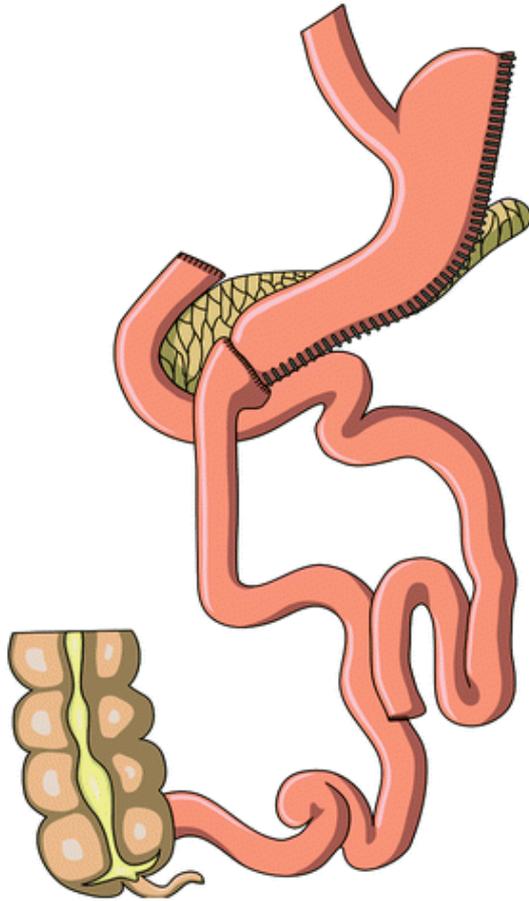
- **Restrictive & Malabsorptive**
- **Decreased ghrelin levels**
- **Dumping syndrome**

# Sleeve Gastrectomy

- Restriction



# Duodenal Switch



- Minimal weight regain
- High resolution of diabetes

# Adjustable Gastric Band

- **Restriction**



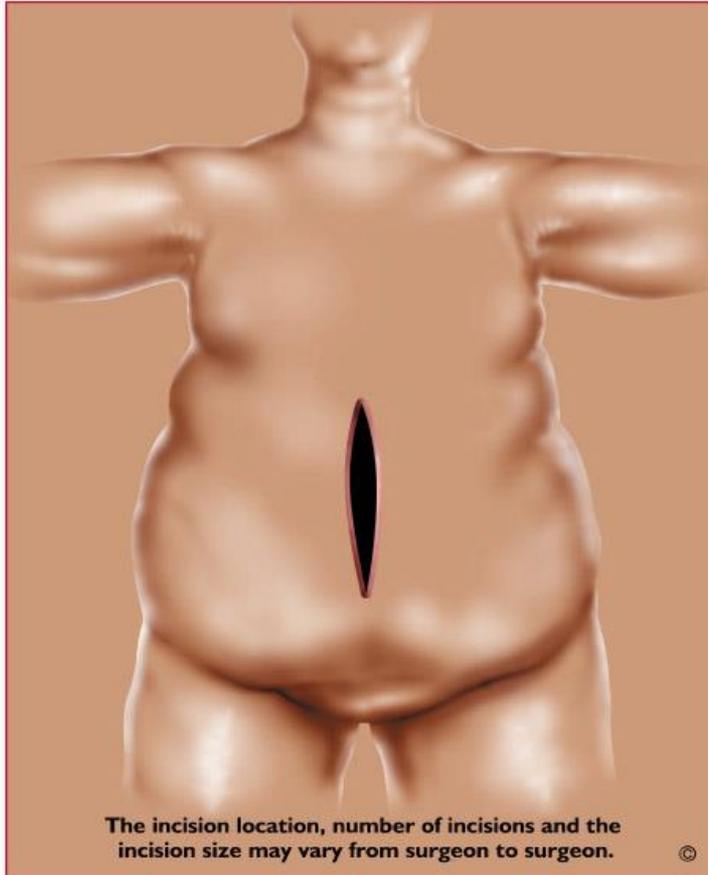
# Techniques

Open

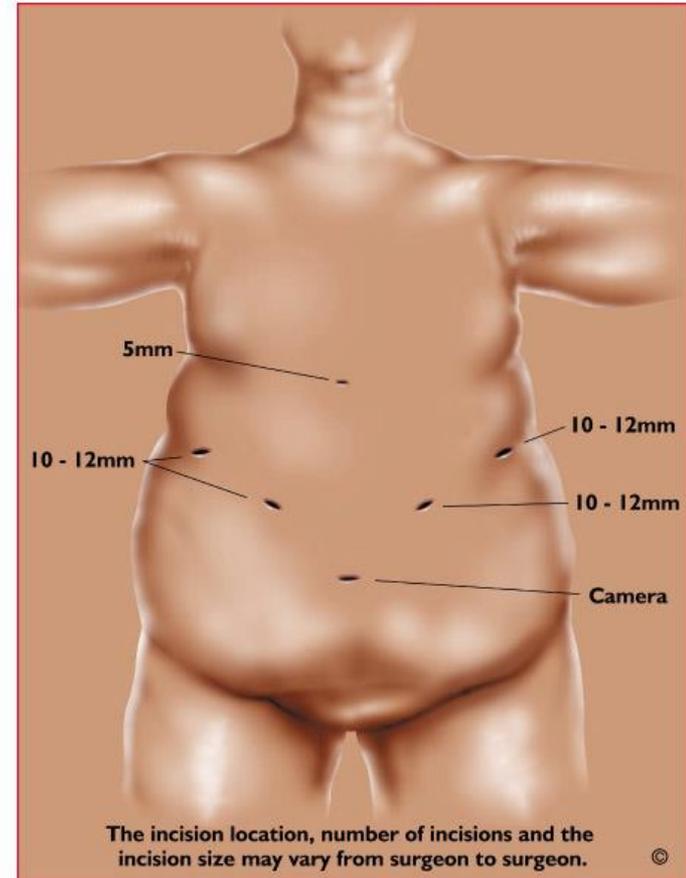
vs.

Laparoscopic

**Incision for Open Weight Loss Surgery**



**Incisions for Laparoscopic Weight Loss Surgery**



# Common aspects of all the surgeries...

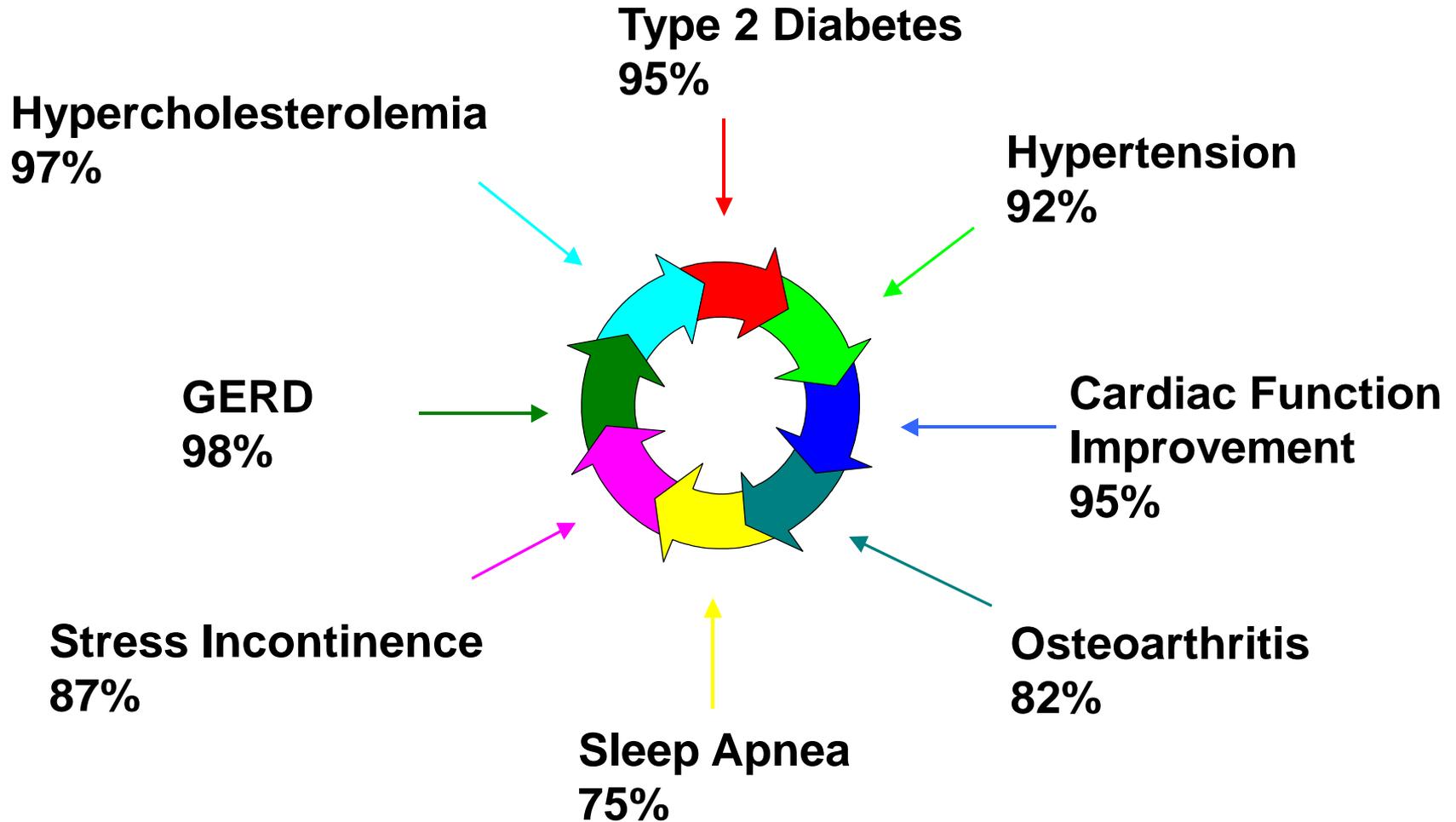
- **Minimally Invasive techniques (Laparoscopy)**
- **General anesthesia**
- **Hospital Stay between 1 to 2 Days**
- **Back to work in min 2 weeks**

# Results of Bariatric Surgery\*

- **Improvement or resolution of obesity-related medical problems**
- **Increased longevity**
- **Improved quality of life**
  - **psychological**
  - **health**
  - **social**
  - **personal**
  - **work**
- **Weight loss**

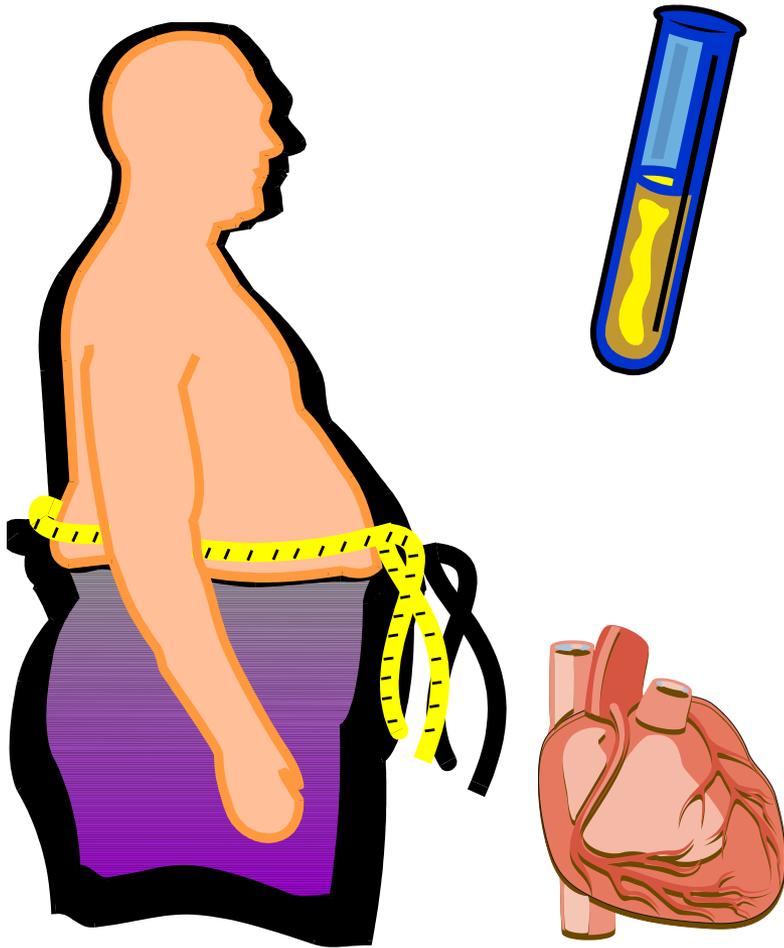
\*Results achieved in most, but not all cases. Degree of improvements vary by individual

# Resolution of Obesity-related Conditions



*Wittgrove AC, Clark GW. Laparoscopic Gastric bypass roux-n-y-500 patients. Obese Surg 2000.*

# Metabolic Syndrome

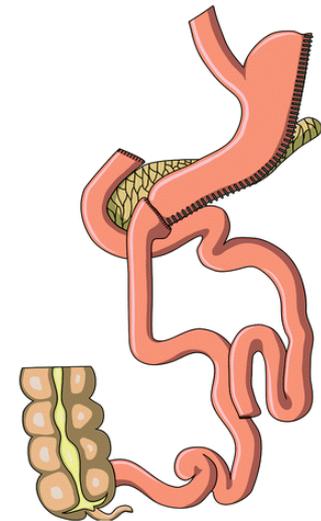
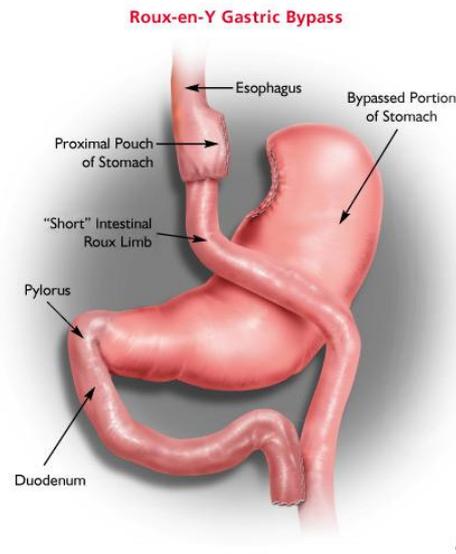
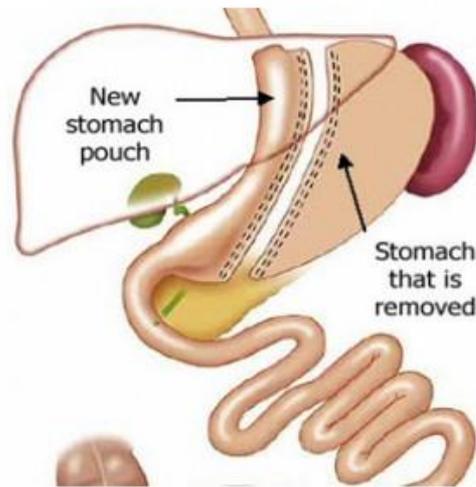


- Abdominal (central) obesity
- Insulin Resistance
- Hyperinsulinemia
- Type II Diabetes
- Dyslipidemia
- Hypertension
- Heart Disease
  
- Medical management
  - Successful <5%

# Metabolic Syndrome

## Surgical Management

Successful >70%



# Results of Bariatric Surgery

- **Mortality 0.1 %** (*JACS, 2011 – BOLD database*)
- **Decrease risk of Cancer** (*Cristou et al, 2008*)
  - **Increase in longevity 89%**

# Complications

- Complications in general of cases of LSG (6.3%) were significantly lower than patients with LRYGB (10.0%,  $p < 0.0001$ ) but higher than cases of LAGB (2.4%,  $p < 0.0001$ ).
- Serious complications were similar for LSG (2.4%) and LRYGB (2.5%,  $p = 0.736$ ) but higher than in the BG (1.0%,  $p < 0.0001$ ).
- Long-term weight decrease was better for the LRYGB followed by the LSG and then the gastric band. The weight loss was more abrupt in the first year for the three procedures, then leveled and increased after the years.
- The excess body weight loss per year was 13% less for the LSG (60%) compared to the LRYGB (69%,  $p < 0.0001$ ) but it was 77% more for the LSG than for the LAGB (34%,  $p < 0.0001$ ).
- With respect to the resolution of comorbidities related to obesity, quality of life and satisfaction with the results, the LSG presents similar and close results to those of the LRYGB, than the cases of LAGB.

# Complications\*

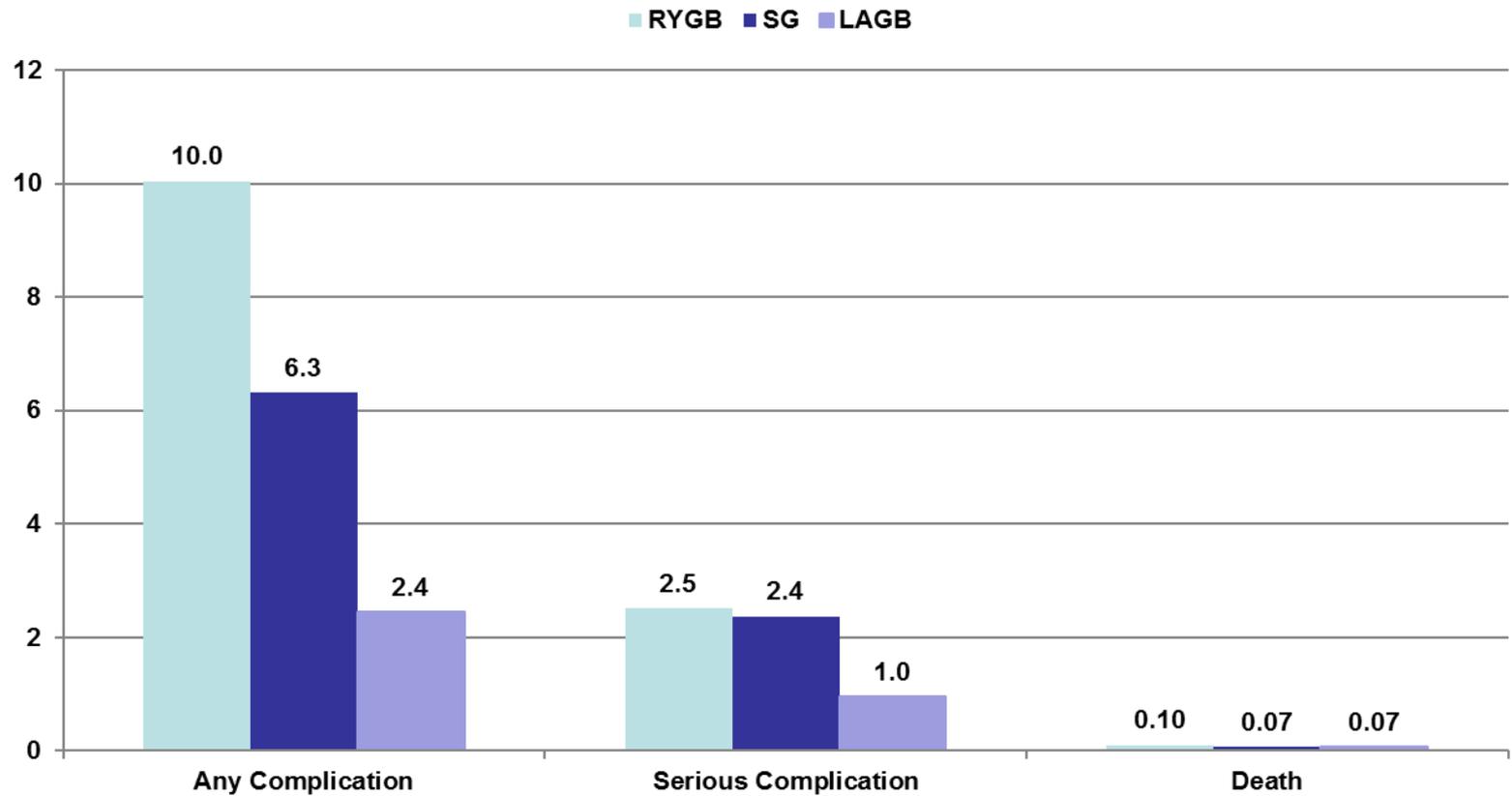
Table 2. 30-Day outcomes among the matched study cohorts

Outcome	RYGB	SG		LAGB	p-value
Leak/perforation	0.6	0.9	0.215	0.0	<0.0001
Obstruction	3.2	0.9	<0.0001	0.3	0.005
Infection	2.8	2.2	0.153	0.7	<0.0001
Hemorrhage	2.3	1.1	<0.0001	0.2	<0.0001
Venous thromboembolism	0.3	0.5	0.413	0.2	0.126
Cardiac	0.1	0.1	0.479	0.0	0.739
Renal failure	0.2	0.2	0.763	0.1	0.527
Respiratory	1.3	0.8	0.094	0.3	0.016
Length of stay (days)	2.3	2.2	0.050	1.0	<0.0001
Reoperation	1.6	1.4	0.515	0.4	<0.0001
Readmission	5.1	5.1	0.906	2.1	<0.0001
Transfer	0.2	0.1	0.479	0.0	0.083
Emergency department visit	9.3	7.4	0.011	3.8	<0.0001

*Carlin, et al.- Annals of Surgery -May 2013 257(5): 791-797*

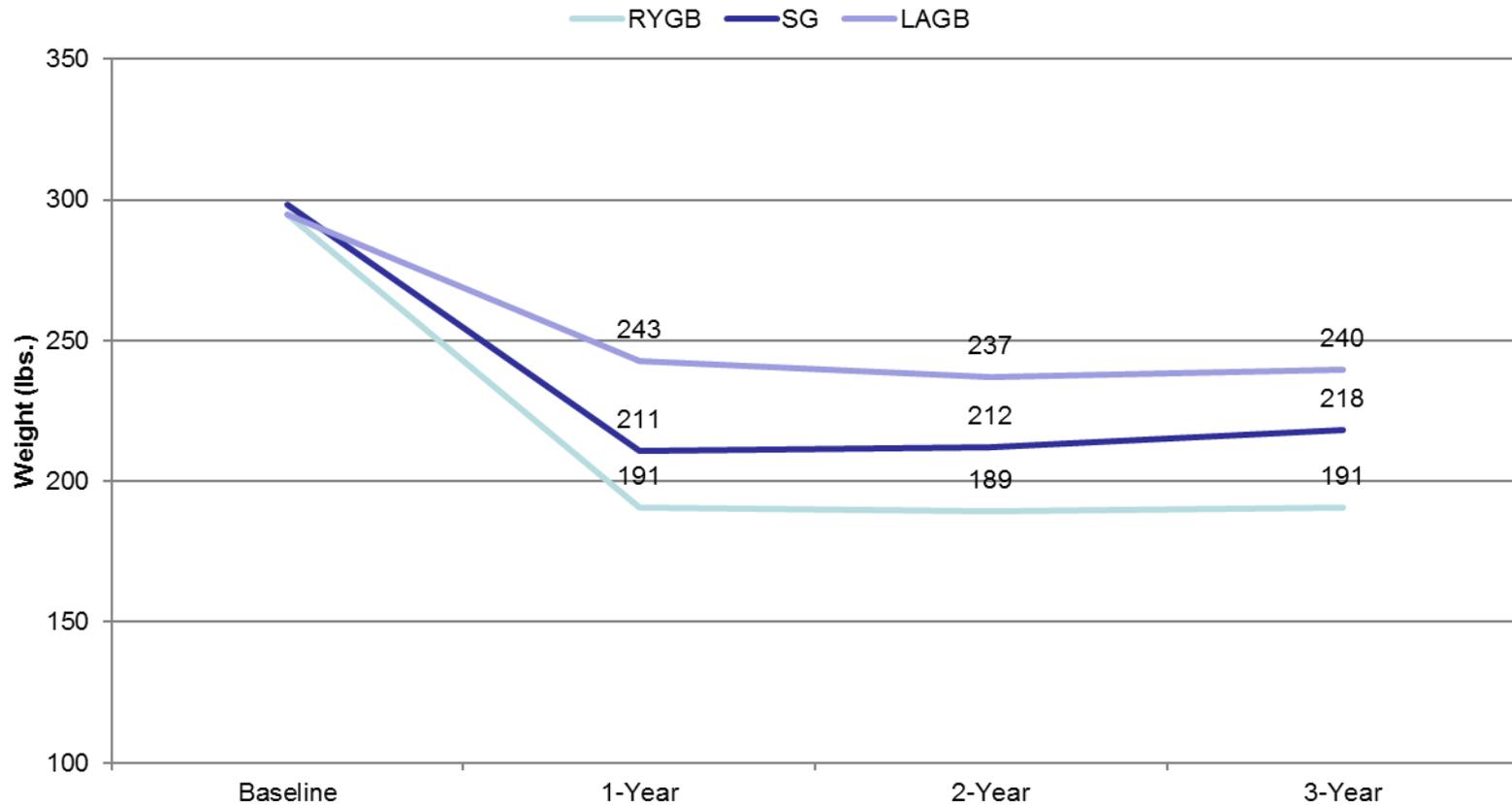
\*Refer to manual and consent form for more complete listing of potential complications

# Complications



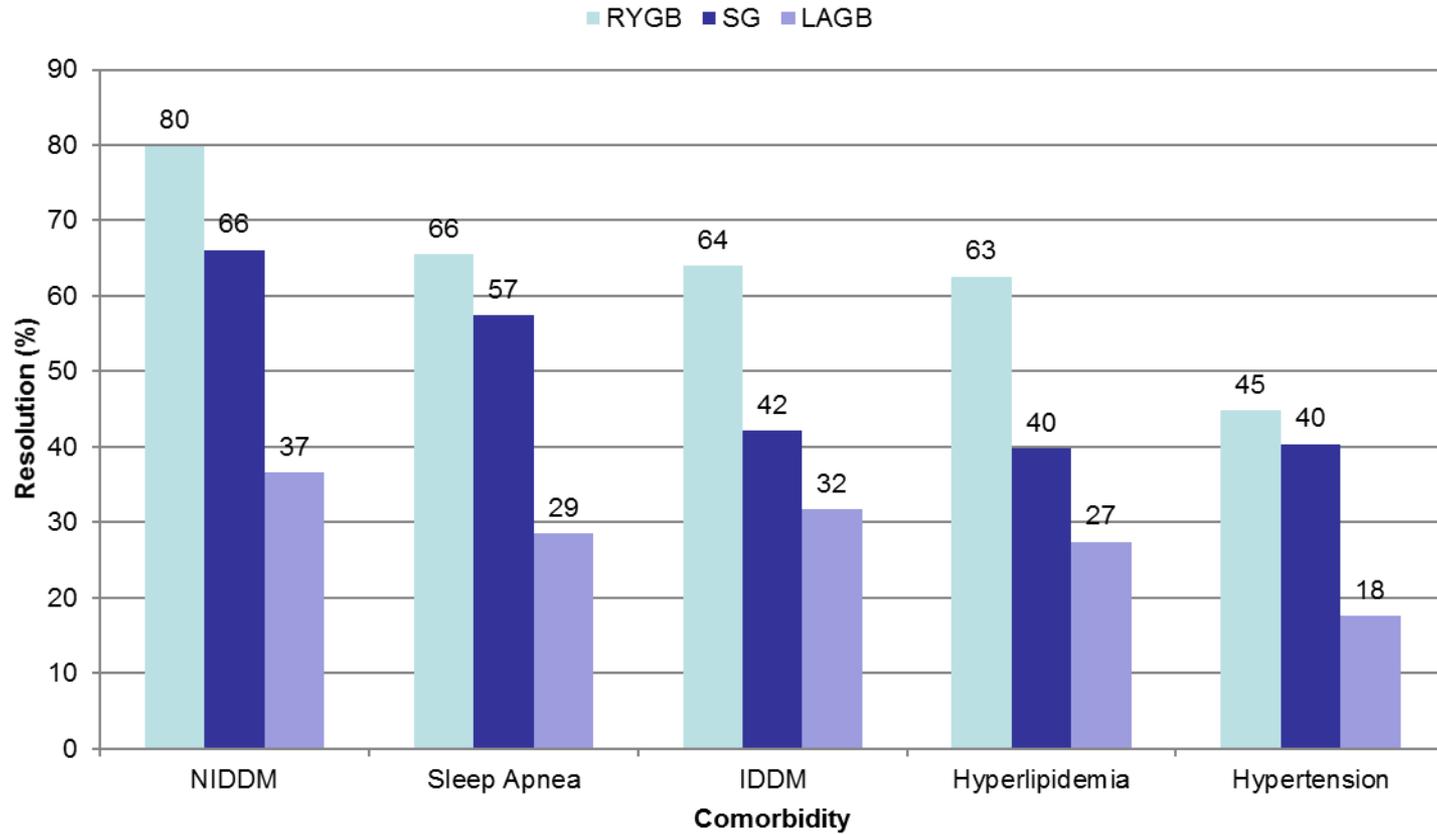
*Carlin, et al.- Annals of Surgery -May 2013 257(5): 791-797*

# Complications



*Carlin, et al. - Annals of Surgery - May 2013 257(5): 791-797*

# Resolution of comorbidities at 1 year of follow up per procedure



*Carlin, et al.- Annals of Surgery -May 2013 257(5): 791-797*

Variable	LGBP (N = 11,617)	LSG (N = 3,069)	LAGB (N = 5,622)	P value
Morbidity, n (%)	589 (5.1 %)	98 (1.4 %)	114 (3.7 %)	<0.0001
Mortality, n (%)	19 (0.2 %)	3 (0.1 %)	3 (0.1 %)	0.1401
Reoperation, n (%)	255 (2.2 %)	48 (1.6 %)	55 (1.0 %)	<0.0001
Op time, mean mins (sd)	126.5 (50.6)	93.3 (45.9)	64.2 (31.5)	<0.0001
LOS, median days (IQR)	2.0 (1.0)	2.0 (1.0)	1.0 (1.0)	<0.0001

***Postoperative complications in bariatric surgery using age and BMI stratification: a study using ACS-NSQIP data - Aliu Sanni, et al. Surgical Endoscopy, 2014***

# Complications\*

- **Early, can occur immediately or up to 2 – 3 weeks PO:**
  - **Leak**
  - **Bleeding**
  - **Stricture**
  - **DVT-blood clot**
  - **Pulmonary embolism**

# Complications

**Early, can occur immediately or up to 2 – 3 weeks PO:**

- **Gastric remnant distention**
- **Bowel obstruction**
- **Heart attack**
- **Pneumonia**
- **Ulcer**
- **Abscess**

# Complications\*

**Late can occur any time post-operatively, more likely seen weeks, months or years later.**

- **Stricture**
- **Ulcer**
- **Internal hernia**
- **Bowel obstruction**
- **Band erosion**
- **Gastric prolapse (Band patients)**
- **Iron-deficiency Anemia**
- **Peripheral Neuropathy**
- **Vitamin & Mineral Deficiency (Take your supplements!!!)**
  - **Iron**
  - **B12**
  - **Calcium**
  - **Vitamin D**

\*Refer to manual and consent form for more complete listing of potential complications

# Side Effects

- **Excess gas**
  - Avoid gum chewing or drinking from straw
  - Simethicone for relief
- **Constipation**
  - Keep well hydrated
  - Can take Senekot Liquid, Colace, Dulcolax
  - Do not take MOM, Mg Citrate, Phosphosoda in first 6 weeks
- **Hair loss**
  - Protein, Iron and Zinc deficiency; take supplements daily
  - Temporary (3rd-12th month)
  - Biotin may slow process

# Side Effects (cont.)

- **Kidney stones (oxalate stones)**
  - **Keep well hydrated and decrease fat intake**
- **Nausea and vomiting (mild is common, severe is not normal!)**
- **Gallstones**
- **Lactose intolerance with gastric bypass**
- **Dumping Syndrome**

# Side Effects (cont.)

- **Fat malabsorption**
  - **Vitamins A, D, E, K**
- **Fatty stools**
- **Vitamin & mineral malabsorption**
  - **Iron deficiency**
  - **Vitamin B12 deficiency**
  - **Calcium deficiency**
  - **Vitamin D deficiency**
  - **Thiamine deficiency**

# Post-op Care: Office Follow-up

- **Bariatric Nutrition**
  - **Approximately 50% of intake should be protein**
  - **80 grams protein daily**
  - **Low carbohydrate, low fat**
- **Alcohol consumption**
  - **Allowed, but within moderation**
- **Pregnancy**
  - **Not advisable within 24 months after surgery (until weight loss is stable)**

# Post-op Care: Office Follow-up

- **Medication adjustment/weaning**
  - **Diabetes, HTN**
- **Medication must be crushed or cut down to appropriate size**
  - **LA, SR, CR, etc. cannot be crushed**
- **Medication absorption rates may be affected**
  - **Coumadin: May be absorbed more readily due to decreased Vitamin K absorption, resulting in toxicity**
  - **Birth Control Pills: Not as effective after gastric bypass due to malabsorption**

# Post-op Considerations

- **Avoid NSAID's and ASA products**
  - **Increased risk for GI bleeding, ulceration or perforation**
- **NO SMOKING! Nicotine causes blood vessel constriction putting your new stomach at risk for ulcers and perforation**
- **Avoid Diuretics**
  - **unless clearly indicated**
  - **Patients can become dehydrated**

# Patient for Life

**The NIH panel in 1991 stated that *“lifelong medical surveillance is necessary”***

- **Physical considerations**
- **Nutritional considerations**
- **Psychological considerations**
- **Social considerations**
- **Let us help you succeed for life!!**