



Surgical Treatment of Obesity: Metabolically-Challenged Patients

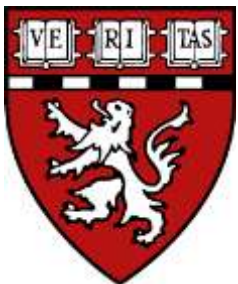
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Surgical Treatment of Obesity:

Metabolically-Challenged Patients

These are the companies with which I have a financial or other relationship (s):

Company Name

Nature of Relationship

Medtronic

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Surgical Treatment of Obesity:

Metabolically-Challenged Patients

Introduction

- *Metabolically-challenged* is the description given to patients with BMI ≥ 50 kg/m² and /or those who suffer from a greater burden of obesity-related co-morbidities than other patients
- Metabolically-challenged patients pose higher morbidity and mortality when they undergo metabolic/bariatric surgery (MBS), however, many will achieve significant benefits from MBS
- This talk will review some of these patients

Surgical Treatment of Obesity:

Metabolically-Challenged Patients

Metabolically-Challenged Patients

- Have a higher burden of obesity-associative diseases such as:
 - BMI > 50 kg/m²
 - Type II diabetes
 - Obstructive sleep apnea
 - Hypertension
 - Non-alcoholic fatty liver disease (NAFLD)
 - Metabolically-challenged patients may benefit from unique treatment algorithms
 - Greater risk of venous thrombosis
- May benefit from unique treatment protocols

Surgical Treatment of Obesity:

Metabolically-Challenged Patients

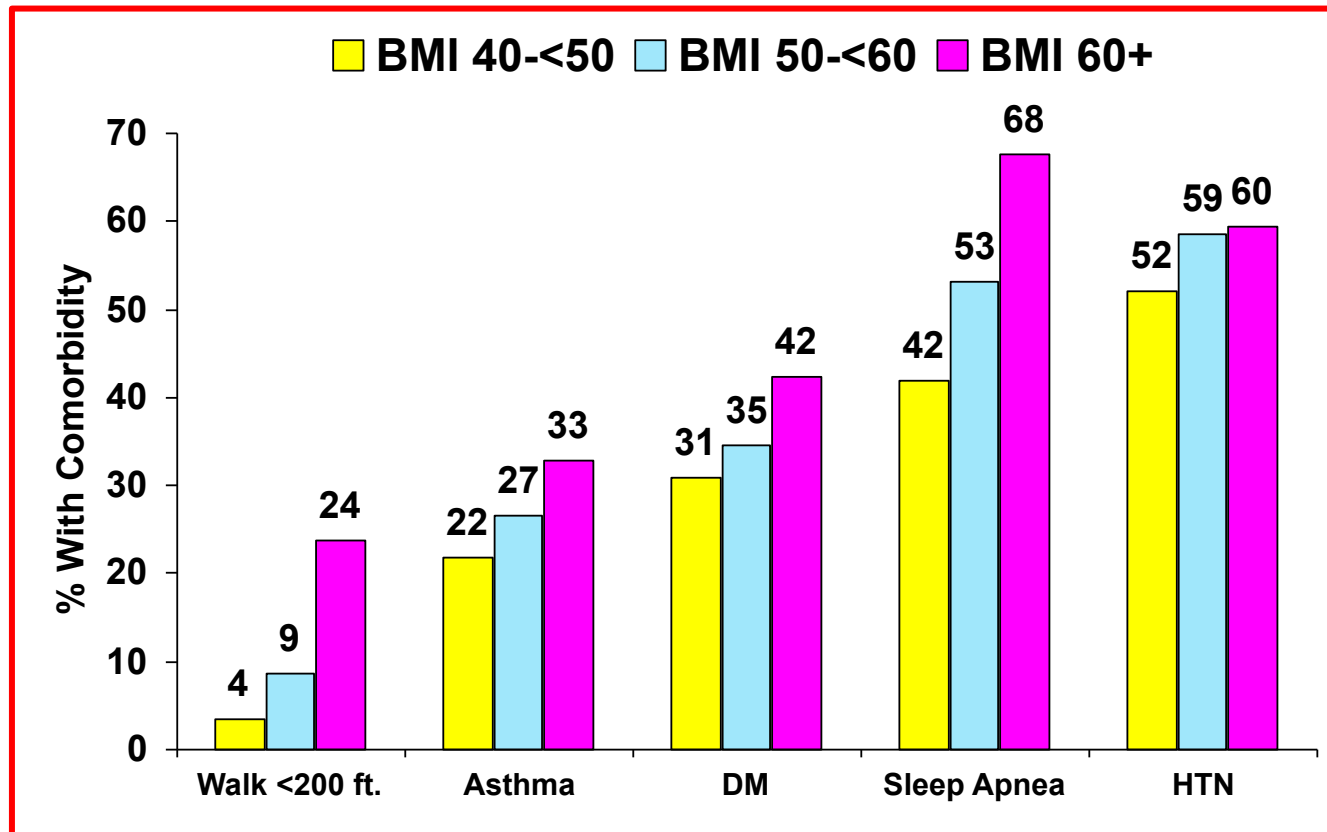
$$\text{BMI} \geq 50 \text{ kg/m}^2$$

- Higher risks for complications
- Reduced responsiveness to weight loss
- Utilize a greater share of healthcare resources
- Laparoscopic sleeve gastrectomy is the preferred initial procedure
- Currently, there are few impactful published papers
- May require more experienced MBS teams and more advanced equipment and devices

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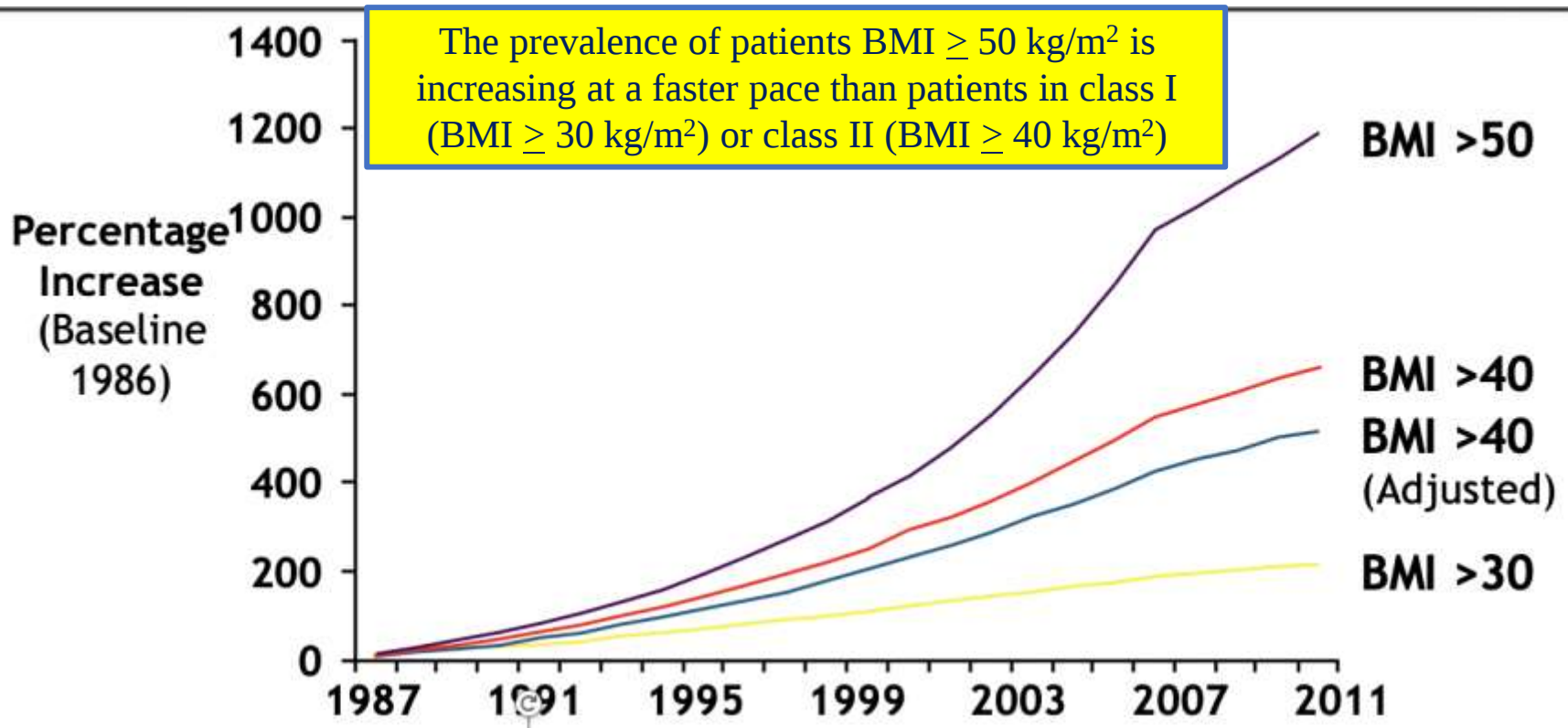
Metabolically-Challenged Patients

High BMI = More Co-morbidity



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The Global Obesity Epidemic



Surgical Treatment of Obesity:

Metabolically-Challenged Patients

Preop Weight Loss - Potential Benefits

- Medical
 - Improved blood glucose control
 - Improved blood pressure
 - Improved sleep apnea
 - Diuresis of excessive fluid resulting in decreased blood volume and improved left ventricular function
 - Improved proinflammatory and prothrombotic states
 - Improved Functional Reserve Capacity and lung volumes

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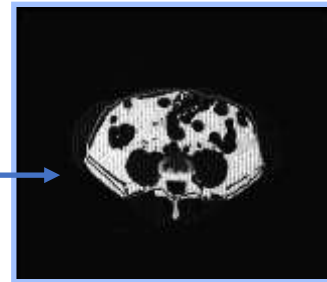
Preop Weight Loss - Potential Benefits

- Surgical
 - Reduction of abdominal wall thickness allowing for more freedom of movement of the trocars and instruments
 - Reduction of visceral fat improving visualization of the viscera
 - Reduction of liver size improving working space and visibility
 - Safer liver retraction
 - Improved pneumoperitoneum
 - Reduced OR time
 - Reduced intraoperative complications

95 kg, BMI=32



85 kg, BMI=29



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Preoperative Weight Loss (PWL)

- The benefits of PWL prior to MBS are controversial
- Reduces intra-hepatic and visceral fat
- Improves blood sugar, respiratory function, fluid status, etc
- Achievable with low-calorie and very low-calorie diets
- Modest weight loss is sufficient (10%)
- May or may not improve weight loss, metabolic conditions, or perioperative complications

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Venous Thromboembolism

- The incidence of venous thromboembolism (VTE) is 0.3% after MBS
- The most common cause of morbidity and mortality
- Events often occur after discharge (1.3%)
- Metabolically-challenged patients may benefit from extended thromboprophylaxis
- Currently, there is no consensus concerning the best agent, dosing and duration of prophylaxis

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Metabolically-Challenged Patients

Weight/Metabolic Disease Recurrence

- MBS most effective way to induce and maintain weight loss
- Surgical weight loss is also the most effective method for improving weight-related co-morbid conditions
- Weight recurrence can result in the return of the co-morbid conditions
- 9 – 91% of patients do go on to regain lost weight

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Metabolically-Challenged Patients

Choice of Surgical Procedure

Sleeve gastrectomy or
Endoscopic gastroplasty

Gastric bypass or
Duodenal switch

Gastric restriction
No intestinal bypass
Lower risk
Less metabolic results

Nutrient hypoabsorption
Intestinal bypass
Greater risk
Better metabolic results

First stage or
Definitive procedure

Definitive procedure

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Obesity Cardiomyopathy

- Multiple mechanisms
 - Increased body mass
 - Inflammation
 - Impaired cardiac metabolism
 - Blood volume expansion (2-3 ml per gm of adipose tissue)
- Complicated by the other co-morbid conditions

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MBS and Obesity Cardiomyopathy

- Obese people without heart disease obtained from the Swedish nationwide registry and the Scandinavian Obesity Surgery Registry
- After a median follow up of 4.1 years, RYGB was associated with a 46% reduction in the incidence of heart failure vs. intense lifestyle treatment

29 new heart failure cases in the lifestyle group
44 new heart failure cases in the surgical group

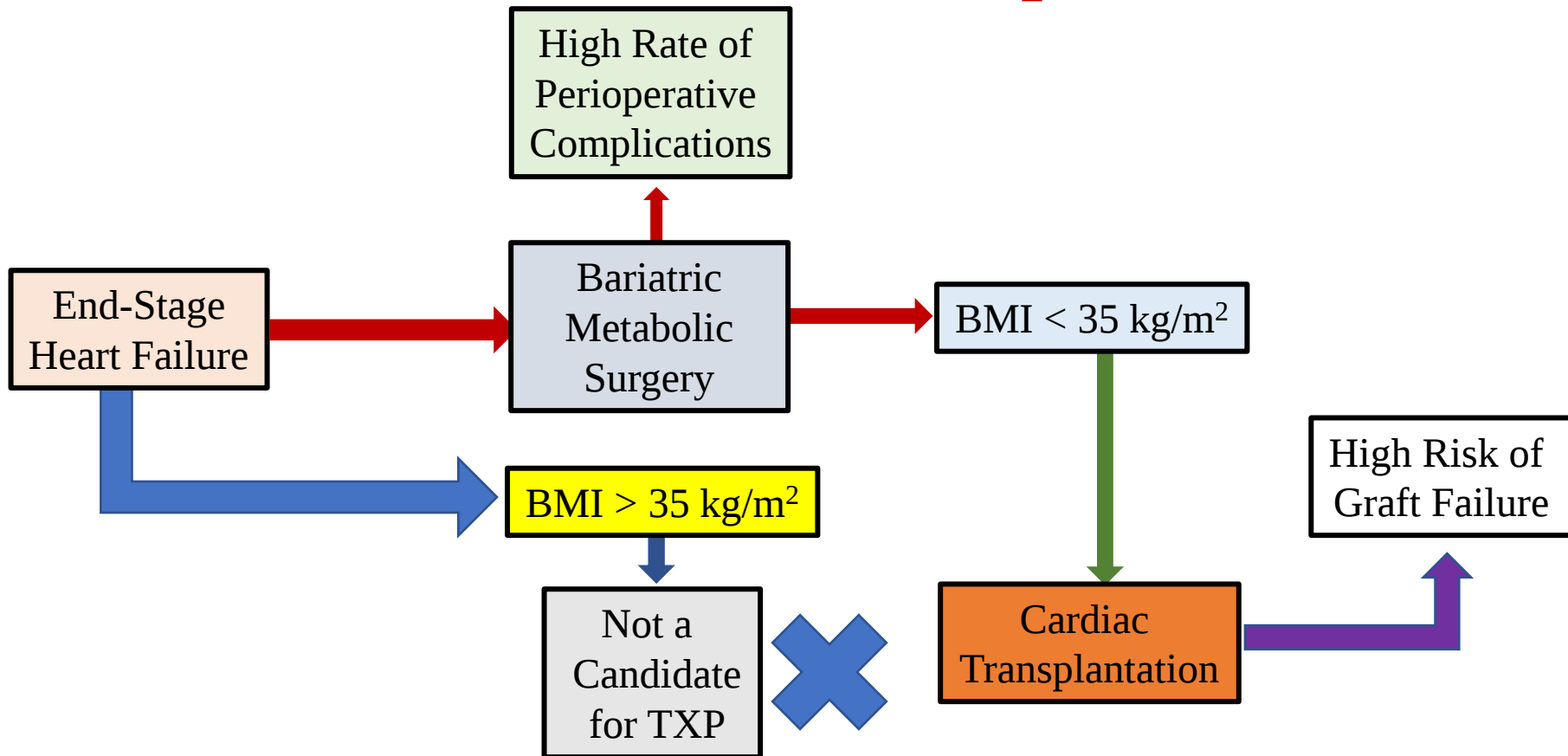
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MBS Improves Cardiac Function

- Follow up of the Utah Obesity Study
- 423 patients who had RYGB compared to 733 severely obese individuals – 2 year follow up
- Results
 - Significant reductions in systolic blood pressure, heart rate, triglycerides, LDL, and insulin resistance
 - Reductions in LV mass index, and RV cavity size
 - Improvements in myocardial function

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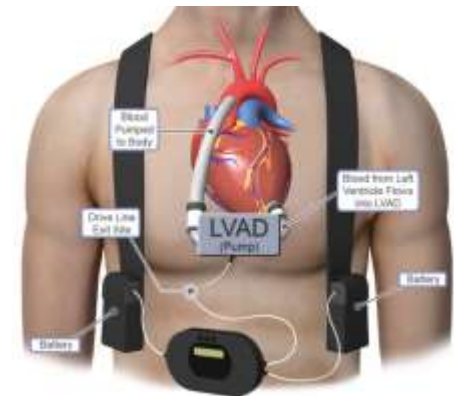
MBS and Cardiac Transplantation



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LVAD and Bariatric Surgery

- Retrospective review of severely obese patients with end-stage heart failure who underwent LVAD implantation
- 240 LVADs implanted 2008-2018
- LVAD alone 15
- LVAD and LSG 14
- Results
 - More patients in LVAD/LSG bridged to heart transplantation (57.1% vs 0%, $p < 0.001$)



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Non-Alcoholic Steatohepatitis (NASH)

- A form of fatty liver disease (NAFLD)
- Inflammation and hepatocellular injury
- Can result in cirrhosis, liver failure, and cancer
- May result in the need for a liver transplant
- MBS is the most effective treatment for NASH syndrome

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Chronic Kidney Disease (CKD)

- Obesity negatively influences the risk of CKD
- Direct effects
 - Adipose tissue accumulation and infiltration of the kidney
 - Increased tubular sodium reabsorption, volume overload and hypertension
- Indirect effects
 - Occurs along with other conditions such as T2DM, HTN, and cardiopulmonary disease

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Favorable Effects of MBS on CKD

- Weight loss
- Reduced blood pressure
- Improved glycemic control
- Reduced inflammation
- Improved lipid profile
- Reduced proteinuria
- Hormonal changes

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MBS and Elderly Patients

- MBS mortality is higher in patients age > 65 years vs. younger patients 30 day mortality is 0.3% in the elderly which is 2-3 fold higher than younger patients
- Age alone is an independent risk factor for morbidity and mortality after MBS
- SG and RYGB are both safe options for seniors

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Conclusion

- Metabolically-Challenged patients are “sicker” than the usual patients and may require special care to tolerate surgery
- However, they will benefit from MBS and should be considered, not immediately rejected
- The LSG is a good choice for these patients