

OBESITY

Obesity is a chronic condition characterized by excess body fat with adverse effects on health, life expectancy, and quality of life. It occurs as a result of the imbalance between the intake and the expenditure of calories, with the excess calories stored as body weight/fat.

The increased body fat/weight becomes the new normal homeostatic state, and the body defends this new state by increasing meal portions and decreasing meal intervals; Thus, the advice to change lifestyle and eat less and do more exercise are unlikely to work in the long term. The most commonly used measure of obesity is the BMI.

BODY MASS INDEX (BMI)

Body mass index (BMI) is used as an estimate of adiposity (excessive adipose/fat tissue).

It is a person's weight in kilograms divided by the square of height in meters.

$$\text{Body Mass Index} = \frac{\text{Weight (in kg)}}{\text{Height}^2 \text{ (in m)}}$$

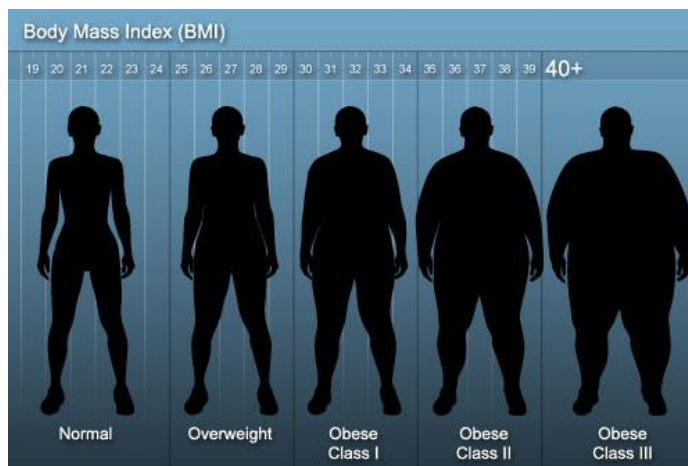
CLASS OF WEIGHT

- Healthy weight
- Overweight
- Obesity

BMI

18.5-24.9 kg/m².
25.0-29.9 kg/m²
30.0 kg/m² or higher.

Obesity can be further subdivided into 3 categories



- Class 1 obesity (BMI 30.0-34.9 kg/m²)
- Class 2 obesity (BMI 35.0-39.9 kg/m²)
- Class 3 obesity (BMI 40.0 kg/m² or higher)

Another way to identify been overweight is to measure waist circumference (WC).

Assessment of Health Risks in Adults Based on BMI and WC

BMI classification (kg/m ²)	WC (cm)					
	Low		High		Very high	
	Male (<94 cm)	Female (<80 cm)	Male (94 to 102 cm)	Female (80 to 88 cm)	Male (>102 cm)	Female (>88 cm)
Overweight; 25-29.9	No increased risk		Increased risk		High risk	
Class 1 obesity; 30.0-34.9	Increased risk		High risk		Very high risk	
Class 2 obesity; 34.9-39.9			High or very high risk			
Class 3 obesity; ≥40.0			Very high risk			

DIABESITY

Obesity is known to increase the risk for type 2 diabetes mellitus (T2DM), cardiovascular disease (CVD), and death. Obesity and type 2 diabetes have reached epidemic proportions and they not only share the *same underlying causes* – and thus require the same treatment – but they are also 100% preventable and, in some cases, entirely reversible.

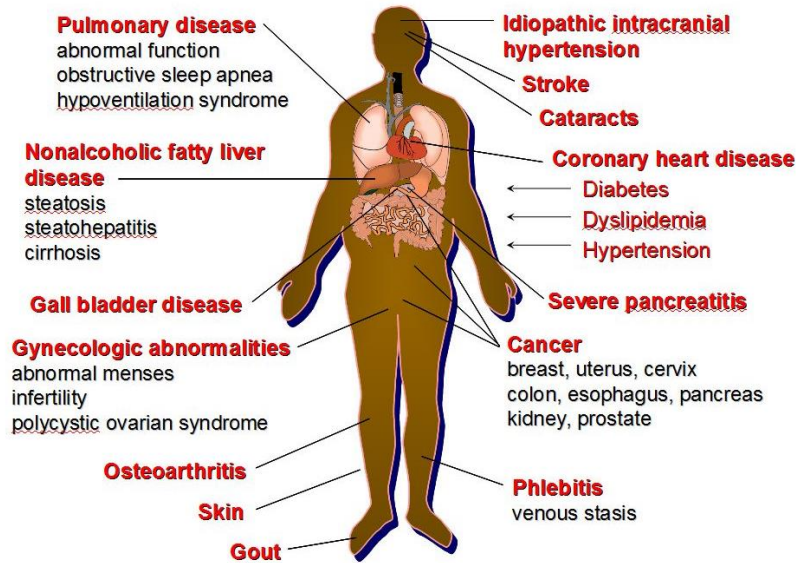
Because of these similarities, the term **diabesity** (diabetes + obesity) was coined to describe them. Diabesity can thus be defined as a constellation of signs that constitutes what is commonly referred to as **metabolic syndrome** characterized by:-

- Central obesity. (defined as waist circumference ≥ 40 inches/ 103cm for men and ≥ 35 inches/ 89cm for women)
- Dyslipidemia:-i.e. raised Total lipid levels, high Low Density Lipoprotein (LDL) & reduced High Density Lipoprotein (HDL) cholesterol.
- High blood pressure.
- High blood sugar/ or previously diagnosed type 2 diabetes

Why is Diabesity becoming increasingly significant?

- Obesity and type-2 diabetes (diabesity) are the largest and fastest growing global public health problem.
- Obesity, which is a major recognized risk factor for type 2 diabetes, is rapidly increasing in prevalence, resulting in a diabesity epidemic.
- For most people, neither dieting nor current pharmacological interventions are effective in achieving long-term weight reduction.
- To treat diabesity, approaches must be developed to modulate the ways in which the brain controls metabolism, body weight and composition.

Other Medical Complications associated with Diabesity include;



THERAPEUTIC OPTIONS FOR OBESITY/DIABESITY

Lifestyle Management

An energy-restricted diet combined with exercise have shown success in producing clinically significant reductions in body weight (>5%). A minimum of 30 minutes of moderate or greater intensity physical activity on a minimum of 5 days in a week is recommended. These behavior modifications however do not generally produce marked or sustainable weight loss.

Pharmacotherapy

Pharmacologic treatment is recommended for people who have not reached their target weight loss or have reached a plateau following lifestyle modifications.

Anti-obesity medications e.g. orlistat when used in combination with behavior changes in diet and exercise, lead to greater body weight loss, which is more likely to be sustained in the long-term if patients can adhere to the treatment regimen.

BARIATRIC SURGERY

Bariatric surgery or weight-loss surgery is performed on patients with a body mass index (BMI) of 40 kg/m² or greater and those with a BMI between 35 and 40 kg/m² and a major medical comorbidity.

In recent years, bariatric surgery is a viable option for patients with lower body mass index (BMI's less than 35 kg/m²) as a definitive treatment for diabetes(particularly Type 2 Diabetes-T2DM) and other metabolic conditions.

Bariatric surgery is by far the most effective treatment for severe obesity.

Role of Bariatric Surgery in Managing Obesity and Associated Metabolic Conditions

- Support weight loss
- Treat or prevent obesity-related comorbidities (e.g. T2DM, Hypertension, Cardiovascular disease, obstructive sleep apnea)
- Diabetes improvement *starts rapidly after surgery, before significant weight loss* has occurred.
- Bariatric surgery may improve metabolic comorbidities even in patients who are not morbidly obese.

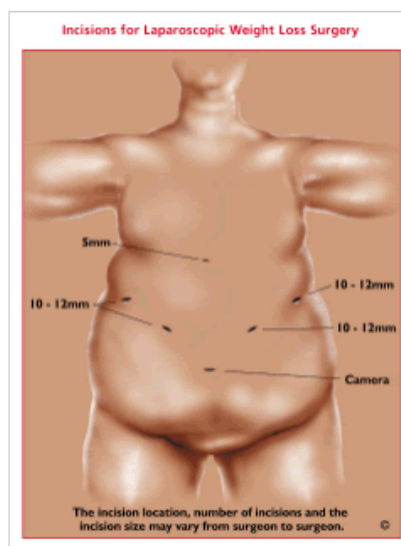
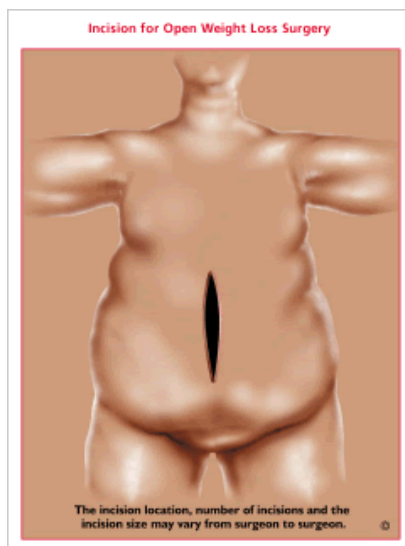
Indications for Bariatric surgery:

- BMI > 40 kg/m²
- BMI ≥ 35 kg/m² and ≥1 severe obesity-related comorbidity, including:-
T2DM, hypertension, hyperlipidemia, obstructive sleep apnea (OSA), obesity hypoventilation syndrome (OHS), Pickwickian syndrome (a combination of OSA and OHS), nonalcoholic fatty liver disease or nonalcoholic steatohepatitis, pseudotumor cerebri, gastro esophageal reflux disease (GERD), asthma, venous stasis disease, severe urinary incontinence, debilitating arthritis, or considerably impaired quality of life;
- BMI of 30-34.9 kg/m² with T2DM or metabolic syndrome
- Several failed attempts at dieting.

There are two *basic mechanisms* of weight loss surgery.

1. **Restrictive procedures** decrease food intake by creating a small upper stomach pouch to limit food intake
2. **Malabsorptive procedures** alter digestion, thus causing the food not to be properly digested and completely absorbed. There are several procedures that combine the restrictive and malabsorptive mechanisms of weight loss surgery.

TWO APPROACHES TO WEIGHT LOSS SURGERY: LAPAROSCOPIC AND OPEN



Open Approach

An open procedure involves one long incision that opens the abdomen to provide the surgeon access. Open procedures for weight loss surgery employ the same principles as their laparoscopic counterparts and produce similar excess weight loss.

Laparoscopic Approach.

This is the currently preferred approach and the one which has popularized metabolic surgery.



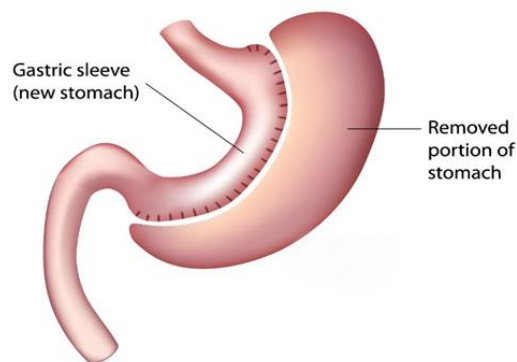
When a Laparoscopic operation is performed, a small video camera inserted into the abdomen allows the surgeon to conduct and view the surgery on a video monitor.

The camera and surgical instruments are usually inserted through small incisions made in the abdominal wall.

Laparoscopic procedures for weight loss surgery employ the same principles as their 'open' counterparts and produce similar weight loss.

The most common types of bariatric surgery include:

■ Sleeve gastrectomy

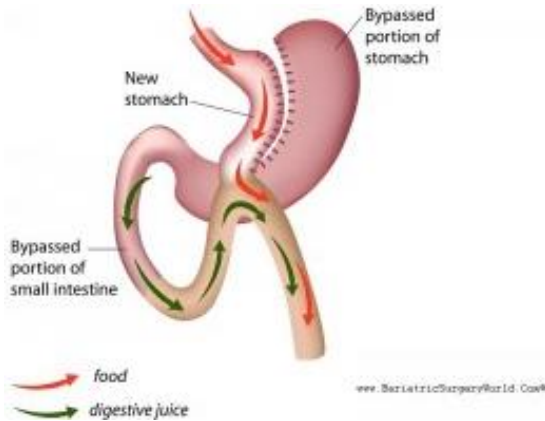


➤ The mean weight loss after Laparoscopic sleeve gastrectomy at 2 years after surgery is 70% of excess weight.

➤ Diabetes remission rates of around 66% at 1 year. Patients with more advanced diabetes experienced the lowest rates of remission, despite having lost just about as much weight as those with lesser disease.

Mini Gastric (Omega) Bypass

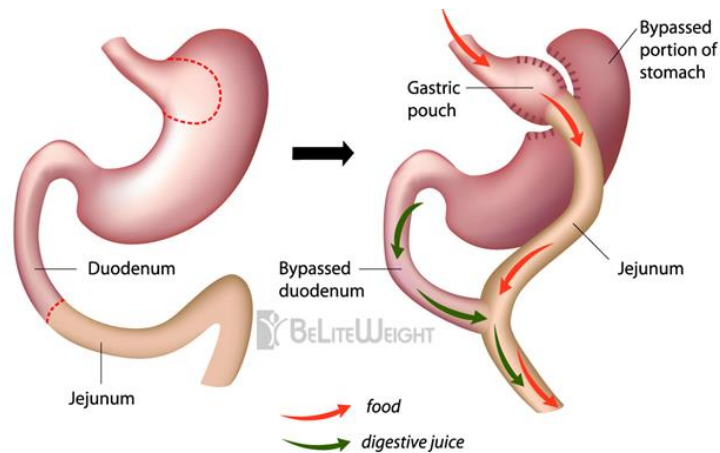




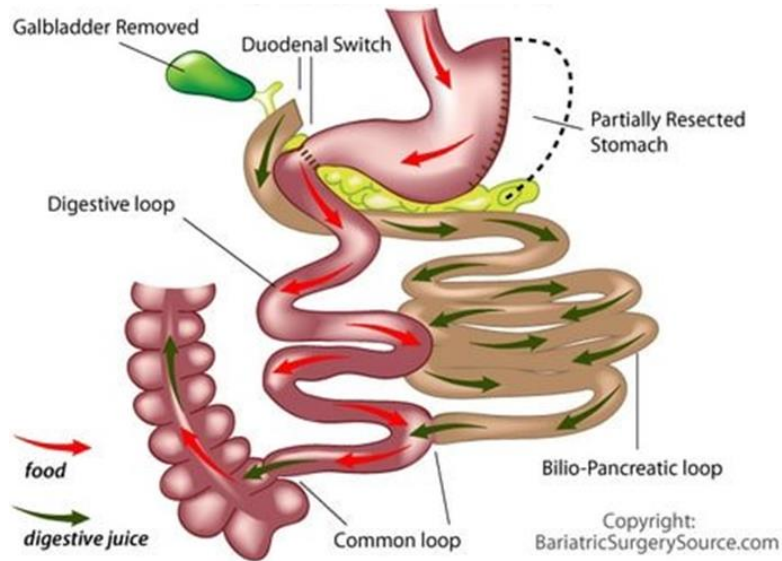
➤ The mean weight loss after a mini gastric bypass is between 58% and 80% over the short term. Most patients are able to keep at least 60% of the excess weight off over the long term.

➤ Mini gastric bypass results in successful treatment of [type 2 diabetes] up to 87.1%.

■ Roux-en-Y gastric bypass (RYGB)

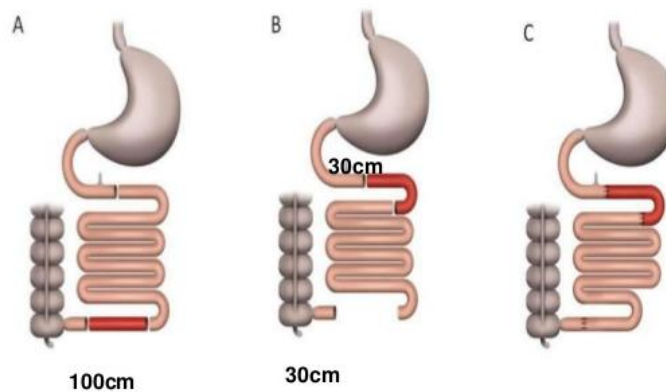


- The mean weight loss after Roux-en-Y gastric bypass at 1 year after surgery is 77% of excess weight.
- 80% of patients with type 2 diabetes (T2D) experience complete remission, defined as normoglycemia without medication, and another 15% have improvement, albeit remaining on medication. For many, remission of diabetes occurs within days, before significant weight loss.
- All-cause mortality reduced by 40% 7 years after RYGB
- RYGB sustained remission of 62% at 6 years



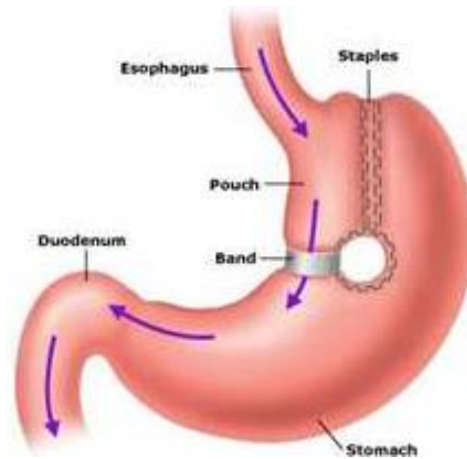
■ Biliopancreatic diversion +/- duodenal switch (BPD+/-DS)

- Type 2 Diabetes have had a 98% "cure" (i.e. became euglycemic) almost immediately following B/D with duodenal switch surgery which is due to the metabolic effect from the intestine switch.
- Resolution of obesity related co morbidities following the duodenal switch: hyperlipidemia 99%, sleep apnea 92%, and hypertension 83%.
- A reduction of 70% of excess body weight can be achieved after BPD.



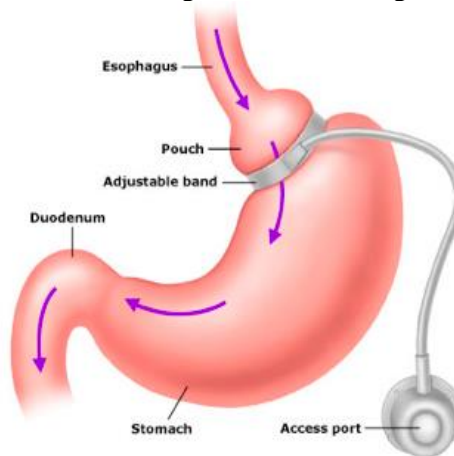
■ Ileal transposition (IT)

- IT is effective in control of blood sugar even after 14 years. The success rate ranges between 80% – 100% depending upon the post-surgical care and levels of activity maintained by the patient.



■ Vertical Banded Gastroplasty.

- Short-term excess weight loss is 56% and long-term excess weight loss is between 53% and 68%.



■ Laparoscopic adjustable gastric banding (LAGB)

- The mean weight loss after Laparoscopic adjustable gastric banding at 3 years after surgery is 60% of excess weight.
- Laparoscopic adjustable gastric banding results in a substantial sustained positive effect on diabetes in morbidly obese patients, with a significant reduction in HbA1c and an 80% overall rate of improvement/remission.

Outcomes of Bariatric Surgery.

- Non-Surgical management: only 5-10% success
- T2DM remission: up to 72% at 2 years
- Cause specific mortality reduction: T2DM 92%, Cancer 60%, Coronary Artery Disease 56%

How does obesity surgery change your life?

- Lifestyle adjustments
 - Patient must learn to eat food in small amounts and to chew it well and slowly.

- Follow-up is necessary every month for three months and then as advised by surgeon for dietary / nutritional counseling.
- Weight loss starts soon after surgery and continues for 2 years.
- Improvements occurs in obesity related medical condition, with almost 60% patients not requiring medication
- There is enhanced quality of life, with improved stamina, mood, self-esteem and body image

Obesity surgery is not a cosmetic surgery, in fact plastic surgery may be required following weight loss after obesity surgery.