# Obesity – A 21$^{st}$ Century Epidemic: Overview and Treatment

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## Scope of the problem

Amazingly, 64% of Americans are now either overweight or obese. Even worse is the fact that our children are the fastest growing group of overweight individuals. Obesity-associated mortality is second only to smoking as a preventable cause of death.

The costs of health care for the obese population are now estimated to be 37.7% higher than persons of normal weight. Gastrointestinally-related medical problems are also increasing dramatically. It will take the active involvement of physicians to help decrease the morbidity and mortality associated with obesity. We will need to diagnose and to treat reflux disease, pancreatitis, cholelithiasis, and liver disease as well as to help to provide postoperative care to those individuals who undergo surgical treatment. Physicians of all disciplines should think about how they can help with this important medical problem in their own practices!(1-5)

Clinicians need to be able to separate fact from fiction when caring for patients. The following statements should help clinicians answer basic questions for patients.

Fact #1 – Obesity comes from an excess intake of calories in relation to output.

Genetic factors are responsible for 40% of the variance in body mass in humans.(6) The number of patients that have genetically-induced obesity is truly small, but have helped our understanding of the molecular mechanics of weight regulation. Hopefully, this understanding will someday translate into additional treatments for the obese patient. It is more likely that the decrease in energy expenditure coupled with greater energy intake is responsible for our present epidemic.(7-10)

Fact #2 – Obesity is a chronic disease like hypertension or hyperlipidemia and needs lifelong therapy.

Physicians must diagnose obesity as they would any other medical problem. BMI is calculated by the relationship of weight (in kg) divided by the height (in $m^2$). BMI is usually highly correlated with the percent body fat; however, those individuals with excess muscle mass may have a BMI suggesting obesity. In addition, some people with BMIs in the normal range may have reduced muscle mass and excess fat.(11) Make the determination of every patient's Body Mass Index (BMI) part of your office routine just like other vital signs.

Fact #3 – Treatment of Obesity is difficult – Most people set unrealistic goals.

Discuss the diagnosis of obesity with your patient. Approximately 45% of women and 30% of men are actively trying to lose weight in our country at any one time.(13) For most patients, the initial goal should be set at losing 5-10% of the current body weight.(14) Even this amount of weight loss has been associated with a significant improvement of many of the obesity-associated medical complications and is often a goal that patients can obtain and maintain.

Methods of Obesity Treatment

a) Diet
b) Exercise
c) Behavior Modification
d) Pharmacologic Interventions
e) Surgery

Fact # 5 – No single diet regimen is "Best".

Dietary intervention is the cornerstone of medical management for obese individuals. No matter what you read in the popular press, the true key is the number of calories consumed in relation to the amount of energy expended. Physicians need to have a more open mind to dietary diversity as we have been too critical of diets proposing high protein, low carbohydrate; however, more long term data are need to understand the cardiovascular and lipid ramifications of such diets.(15,16)

Physicians should consider having a Dietitian available to their practice for consultation. Most physicians do not have either the time or expertise to provide in-depth dietary counseling to their patients.

Fact #6 – Exercise is the best predictor of long-term ability to keep weight off.

Increasing physical activity alone is not an effective initial weight loss method, but physical activity is crucial for the long-term maintenance of weight loss.(17,18) Compliance is the single largest impediment to increasing long-term physical activity. Try to give your patient an Exercise Prescription (ExRx).(19)

Fact #7 – We need more and safer medical treatments.

After the problems associated with the use of Fen-Phen, it is important that the risks and benefits of pharmacotherapy need to be carefully evaluated for each patient. Many issues must be considered before embarking on medications such as which medicine, how long, what is the cost, what to do with non-responders, and how to maximize success.(20,21) As previously discussed, setting a reasonable goal is important, and a medically significant outcome is to lose 10% of body weight in the first 6 months of therapy.

Current Pharmacologic Options - since the use of amphetamines is discouraged for weight loss, they will not be included in the following table:

| Generic name | Sample Trade name(s) | Usual dose range (mg) |
|---|---|---|
| Over-The-Counter | Currently with and without ephedra | varies |
| Phentermines | | |
| Hydrochloride | Adipex-P[a], others | 15-37.5 |
| Resin | Ionamin[b] | 15-30 |
| Phendimetrazine tartrate | Prelu-2[c], Bontril[d] | 35-105 |
| Diethyproprion hydrochloride | Tenuate[e] | 75 |
| Sibutramine | Meridia[f] | 5-15 |
| Orlistat | Xenical[g] and Alli[h] | 120 and 60 |

[a]Gate Pharmaceuticals, North Wales, PA
[b]Celltech Pharmaceuticals, Rochester, NY
[c]Roxane Laboratories, Columbus, OH
[d]Amarin Pharmaceuticals, Mill Valley, CA
[e]Aventis Pharmaceuticals, Bridgewater, NJ
[f]Abbott Laboratories, North Chicago, IL
[g]Roche Laboratories, Nutley, N.J.
[h]GlaxoSmithKline Consumer Health Care, Moon Township, PA

Fact # 8 – Surgical treatment of obesity is not as “bad” as you may think!

For patients with BMIs >40 (or BMI 35-39.9 and one or more severe obesity-related medical complications), bariatric surgery is a reasonable option, if other methods of weight loss fail.(20,22) We will explore this option in more detail shortly.

Fact # 9 – Prevention of Obesity should be a major health initiative for this country!

Although the Federal Government has recognized that obesity is major health problem and included its reduction in the “Wish List” for Healthy People 2010, it will take much more effort from many sources to make this a reality.(21) On July 1, 2003, Kraft Foods announced that it has global plans to reduce sugar, fat and calories in most of its products and will review each of its products to meet its own stricter nutritional guidelines.(23) It will take this type of corporate involvement to bring the issue of health, nutrition and obesity to the forefront of national consciousness!

Fact # 10 – Surgery is not as “bad” as you may think

Our surgical colleagues maintain that for the truly obese patient with a BMI > 40 that only surgical intervention results in reliable results. However, it must be remembered that surgery in this population has morbidity and mortality associated with it. The public has become interested in surgical options through the internet, family & peer experience as well as celebrities who have done well with surgery. Unfortunately, there are not enough surgeons to help all of the potential patients! Also, there are many questions to be answered about the different surgical techniques.

In 1990, the NIH convened a Consensus Conference for obesity. It helped to set guidelines for patient selection, surgical procedures and program support.(22) The current Bariatric Surgery options are as follows:

**Bariatric Surgery Options**

- **Restrictive procedures**
  - Gastroplasty (vertical banded)
  - Lap-Band
- **Malabsorptive procedures**
  - Distal bypass
  - Biliopancreatic diversion
  - Duodenal switch
- **Combination restriction/malabsorption**
  - Roux-en-y proximal gastric bypass

Studies discussed in the presentation can be found in the reference section.(24-38) Bariatric surgery is here to stay, but efforts must be made to minimize poor outcomes and to analyze outcomes and further refine what is done.

*Additional Learning Material for the Management of Complications from Weight Loss and Bariatric Surgery*

A. Complications of rapid weight loss – either medically or surgically induced
   a. Cholelithiasis
      Regardless of the etiology, rapid weight loss is a risk factor for gallstone formation. Bile becomes supersaturated, and then biliary sludge is believed to be a precursor for gallstone disease. The incidence of gallbladder sludge after gastric bypass was reported to be as high as 50% within the first six month following this surgery.(39) The incidence of symptomatic gallbladder disease after bariatric operations ranges from 3 to 30%. Some centers practice prophylactic cholecystectomy, while other centers use ursodiol therapy.(40)

B. General complications related to Surgery in the obese population (20)
   a. Deep venous thrombosis (DVT) and pulmonary embolus (PE)
      Pulmonary embolus is probably the most common cause of unexpected death in this population. While the incidence is approximately 1-2%, almost one third who suffer a PE will die. PE has been implicated in the sudden death of patients undergoing bariatric surgery in the immediate post-operative period and up to a month after the procedure.(41)
   b. Anastomotic or staple-line leak
      This is occurs in approximately 2%-5% of laparoscopic procedures compared to 1-2% in open procedures. The rate of this complication decreases to approximately 1% with increasing experience laparoscopically.(38)
   c. Atelectasis/respiratory complications
   d. Incisional hernias
      Incisional hernia is the most common late complication after open gastric bypass with an incidence ranging from 10-20%. This complication is greatly reduced with laparoscopically performed bariatric procedures.

C. Complications specific to restrictive procedures (20)

a. Acute gastric distention

This is an uncommon complication can present as massive gastric distention in the bypassed segment. This may occur due to edema or obstruction at the enteroenterostomy.

b. Internal hernias

c. Stomal ulceration

The rate of stomal ulceration following an undivided gastric bypass is 12 to 15%, though the incidence of ulceration is lower with a divided procedure. The ulcers usually develop on the jejunal side of the anastomosis. The etiology of the ulceration appears multifactorial and is likely due to acid peptic disease, ischemia/tension at the anastomosis, and possibly use of nonsteroidals.

d. Late gastrointestinal hemorrhage from the excluded stomach/duodenum

e. Stomal stenosis (42)

This is a relatively common complication occurs in about 12% of restrictive procedures. The gastrojejunal stoma is most effective at 1 cm in diameter. Balloon dilatation via endoscopy is very effective treatment.

f. Staple-line disruption

This occurs with either a vertical banded gastroplasty or an undivided gastric bypass procedure. Symptoms are usually subclinical and may result in decreased efficacy of the intervention. Sudden weight gain after doing well is often a clue to this diagnosis.

g. Wound infections

Major wound infection after gastric bypass is in the range of 1-3%.

h. Nutritional complications – any of the following may occur: (43-45)

- protein-calorie malnutrition - uncommon in standard restrictive procedures
- iron and deficiency anemia
- $B_{12}$ and folate deficiency
- calcium malabsorption

i. Metabolic bone disease

j. Bowel obstruction

D. Complications specific to malabsorptive procedures – (20)

a. Length of common channel may be important in determining presence and severity of nutritional complications.

b. Nutritional complications

- calcium malabsorption can lead to osteoporosis and renal oxalate stones
- fat malabsorption can result in deficiencies of fat soluble vitamins
- disruption of the enterohepatic circulation may compromise $B_{12}$ levels
- protein-calorie malnutrition may occur and can be severe
- bacterial overgrowth can occur in the bypassed segment leading to:

antigen-antibody joint deposition leading to rheumatologic complaints

| | |
|---|---|
| bypass enteritis | GI tract bleeding |
| hepatic dysfunction/cirrhosis | interstitial nephritis |
| iron-deficiency anemia | pneumatosis intestinalis |

E. Complications associated with laparoscopic banding - (22,24-33)
   a. In some series, the overall procedure has been associated with disappointing weight loss and a higher degree of complications.
   b. Reoperation for complication has ranged between 15-23%. These complications have included pouch dilatation, stomach slippage, band erosion, band or tube leakage, and infections

F. Endoscopic intervention in obesity surgery complications
   a. Common indications for endoscopy in the postoperative bariatric patient includes evaluation of symptoms, management of complications and evaluation of failure of weight loss.
   b. Endoscopic balloon dilatation of stomal stenosis
   c. Endoscopic access for evaluation/management of bleeding or jaundice
   d. Endoscopic fibrin sealing of gastrocutaneous fistula

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Useful websites

1) www.MyPyramid.gov
2) www.fitday.com
3) www.healthetech.com - BalanceLog