



# Obesity: A Real Disease & a Real Problem

Patrick Northcraft, NP, CBN,  
CSOWM

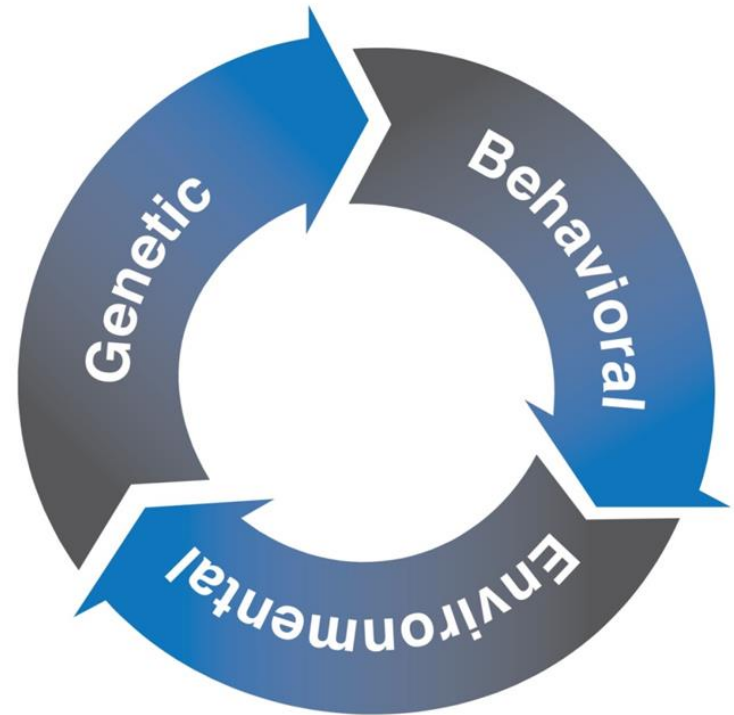
# The Obesity Medicine Association definition of Obesity

- *Obesity is defined as a chronic, progressive, 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®. © 2019 Obesity Medicine

# Obesity is a multifactorial disease

- Genetics/ Epigenetics
- Behavior
- Environment (social/culture)
- Medical
- Endocrine





# Causes

- Multifactorial inheritance factors that contribute to obesity
  - Mother & Father
    - Genetic inheritance,
    - Epigenetic inheritance,
    - Social and cultural inheritance (Extragenetic)
- obesity and its complications

# Obesity Causes

- **Epigenetic-**

- study of heritable changes in gene expression (active versus inactive genes) that do not involve changes to the underlying DNA sequence
- Change in phenotype (*observable physical trait*) rather than genotype (*inherited genetic make up*)
- ***understanding that both the environment and individual lifestyle can also directly interact with the genome to influence epigenetic change***

# Epigenetics

- **Pre-pregnancy:**
  - Preconception- paternal and maternal overweight or obesity make impact genetic singling.
    - Increase risk over weight or obese
    - Increase risk CV disease, DM
- **Pregnancy: “you are what you eat”**
  - what the mother eats during pregnancy can increase the risk of the baby becoming obese as an adult.
  - studies have concluded that over-nutrition during pregnancy is associated not only with a higher BMI during the adolescence of the child, but also has been proved to be a risk factor for a range of problems at later life stages including high systolic blood pressure, higher glucose levels and, insulin-resistance.
  - women who develop GDM or women who have been diagnosed with type 1 or type 2 diabetes prior to conception, increase the risk of her baby developing obesity, central adiposity, higher insulin secretion, and lower HDL cholesterol levels. Uncontrolled blood sugars it can actually compromise the intellectual performance and psychomotor
  - Dutch Famine 1944-1945: people in utero during the famine, when they became adults, they ended up a few pounds heavier than average. In middle age, they had higher levels of triglycerides and LDL cholesterol. They also experienced higher rates of such conditions as obesity, diabetes and schizophrenia.

# Epigenetics

- **Post pregnancy**
  - Improvement in generational obesity in offspring will likely require generational change in nutrition and physical activity in prior generations of parents



# Obesity Causes

- Extragenetic
  - Environment (home, family, location)
  - Culture
  - Lack of optimal nutrition and physical activity
  - Disrupted sleep
  - Medications
  - Abnormal gut flora

# Classification of Obesity

- Normal weight: BMI- 18.5-24.9
- Over weight: BMI- 25.0-29.9
- Obesity Class I: BMI- 30-34.9
- Obesity Class II: BMI- 35-39.9
- Obesity Class III: BMI- >40

# Waist Circumference: Increase body fat (adiposity)

- Abdominal Adiposity  
in Men/Women
  - >40 inches or >102cm
  - >35 inches or 88 cm

## Body Fat:

- **Acceptable**
  - Men 18-24%
  - Women 25-31%

## **Obesity**

- Men >25%
- Women >32%

An increase in body mass index (BMI), waist circumference (WC), and percent body fat (%BF) all correlate with an increased prevalence of **metabolic syndrome**

# The Obesity Medicine Association definition of Obesity

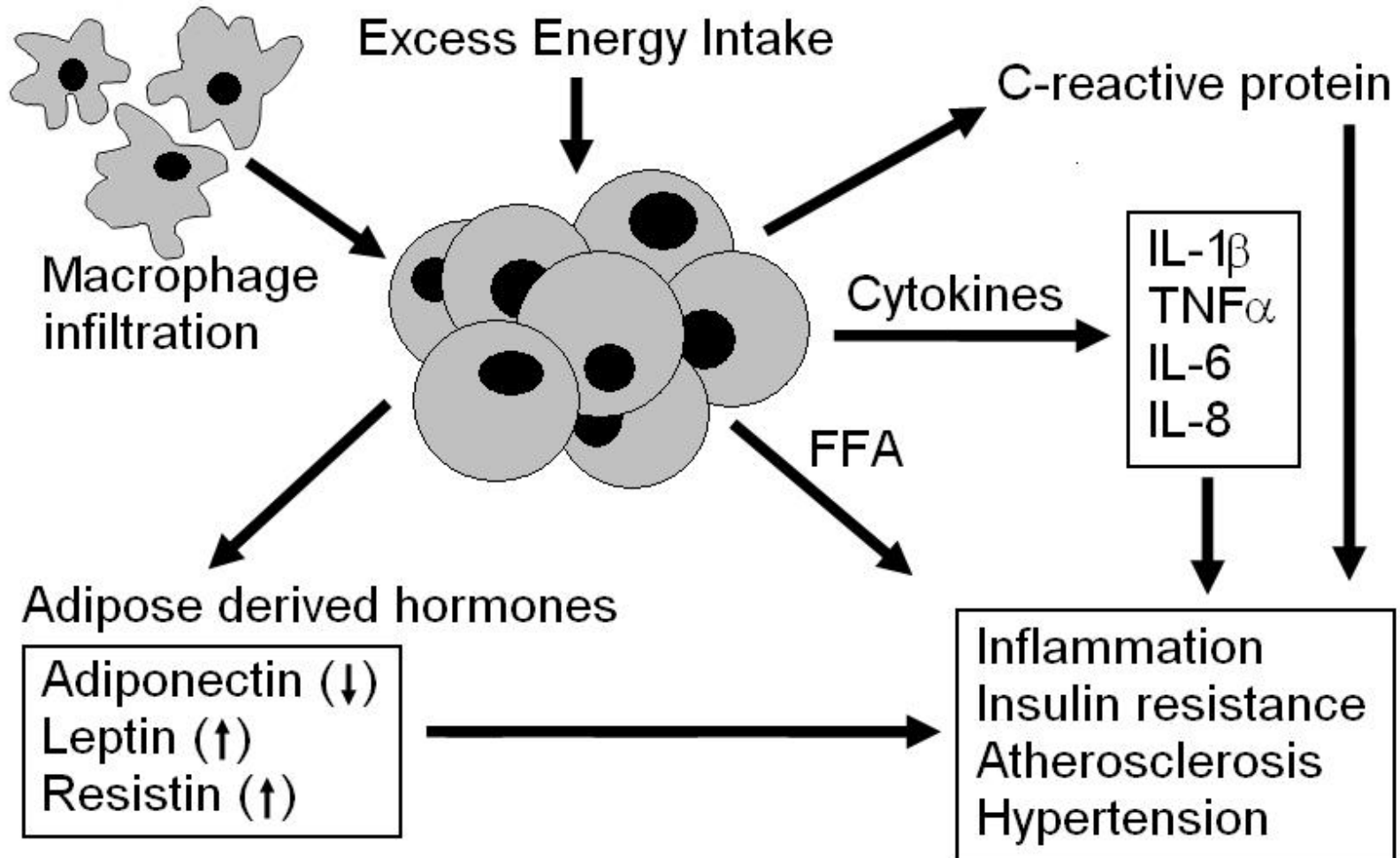
- *Obesity is defined as a chronic, progressive, relapsing, multi-factorial, neurobehavioral disease, wherein an increase in **body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces**, resulting in adverse metabolic, biomechanical, and psychosocial health consequences.”*

Obesity Algorithm®. © 2019 Obesity Medicine

# Patients Who are Overweight or Obese

- Deranged endocrine and immune responses
  - **Sick Fat Disease (SFD)**
- Abnormal and pathologic physical forces
  - **Fat Mass Disease (FMD)**

# Sick Fat



# Metabolic Manifestations of Adiposopathy

- High blood glucose (prediabetes mellitus, type 2 diabetes mellitus)
- High blood pressure
- Metabolic syndrome
- dyslipidemia
- Insulin resistance
- Hepatosteatorosis (fatty liver)
- Hyperuricemia and gout
- Cholelithiasis



# Gender-specific Manifestations of Adiposopathy

## Women

- Hyperandrogenemia
- Hirsutism
- Acne
- Polycystic ovarian syndrome
- Menstrual disorders
- Infertility
- Gestational diabetes mellitus
- Preeclampsia
- Thrombosis

## Men

- Hypoandrogenemia
- Hyperestrogenemia
- Erectile dysfunction
- Low sperm count
- Infertility

# ABCD

- **Obesity or Adiposity Based Chronic Disease?**
  - redefines the medical diagnostic term for obesity and shifts the emphasis to the pathophysiological effects of excess weight rather than the weight and/or body mass index (BMI) itself.
  - ABCD points to abnormalities in the mass, distribution, and/or function of adipose tissue, whereas the "chronic disease" part underscores associated complications such as hypertension, diabetes, and sleep apnea that produce morbidity and mortality.

# Obesity and Adiposopathy Increases the Risk of Cancers

- Bladder cancer
  - Brain cancer
  - Breast cancer (postmenopausal)
  - Cervical cancer
  - Colon cancer
  - Endometrial/uterine cancer
  - Stomach
  - Thyroid
- Just to name a few..... OW and Obesity estimated to cause 40% of cancers in 2014

# Fat Mass Disease

Abnormal and Pathological physical forces

- Cardiovascular
  - Congestive heart failure and cor pulmonale
  - Varicose veins
  - Thromboembolic events (i.e., pulmonary embolus, stroke)
  - Hypertension (i.e., compression of kidney)
- Pulmonary
  - dyspnea
  - OSA
  - hypoventilation
  - Asthma
- Neurological
  - pseudotumor cerebri-
  - Nerve entrapment (CTS)

# Fat Mass Disease

- **Musculoskeletal**

- Immobility
- Joint pain
- Low back pain
- Impaired balance

## **Gastrointestinal**

GERD

Hernial

- **Integument**

- Striae distensae (skin stretch marks)
- Stasis pigmentation
- Venous stasis ulcers
- Cellulitis
- Skin tags
- bacterial, fungal skin fold infections

# Fat Mass Disease

- Depression
- Low self esteem
- General Bias (family, society)
- Health Care Bias (provider neg attitude, stereotypes)
- Negative perceptions
  - Lazy
  - Unmotivated
  - Weak-minded

# Evaluation

- Medical History and Review of Systems
  - **Fat mass disease** (i.e., osteoarthritis, sleep apnea)
  - **Adiposopathy** (i.e., type 2 diabetes mellitus, high blood pressure)
  - Eating disorders
  - Mental stress
  - Sleep pattern
  - **Medications** that may affect body weight
  - Cigarette smoking
  - Alcohol intake
  - Recreational drug use (e.g., marijuana, cocaine)

# Medication History

- Carbamazepine
- Gabapentin
- Valproate
- Pregabalin
- Lithium
- Some selective serotonin reuptake inhibitors (e.g. paroxetine, duloxetine)
- Some Beta Blockers (atenolol, metoprolol)



# Medications

- Diabetes Mellitus Medications

May increase body weight:

- Most insulins
- Sulfonylureas
- TZDs
  - Aka glitizones- Actos, Avandia

- Hormones

- Estrogen
- Glucocorticoids

Progestins

- Injectable or implantable progestins may have greatest risk for weight gain
- May be dependent upon the individual

# Antipsychotics

- May substantially increase body weight:
  - Olanzapine ( Zyprexa)
  - Quetiapine (**Seroquel**)
  - Clozapine (Clozaril)
  - Risperidone (Resperdal)
  - Lithium

# Evaluation

- Nutrition history
  - Timing
  - Frequency
  - Nutritional content
  - Preparer of food
  - Access to foods
  - Location of home food consumption (i.e., eating area, television, computer, etc.)
  - Location of away food consumption (i.e., workplace restaurants, fast food, etc)

# Nutrition History

- Behavior
  - Previous nutritional attempts to lose weight
  - Triggers (hunger, cravings, anxiety, boredom, reward, etc.)
  - Nighttime eating
  - Binge eating
  - Emotional eating
  - Family/cultural influences
  - **Readiness for change**

# Evaluation

- Physical Activity
- Physical Exam
- Lab
- Cancer screening up to date

# Treatment

- Nutrition
- Physical Activity
- Behavior Therapy
- Pharmacotherapy
- Bariatric Surgery

# What are we treating

- Treat a adipose tissue dysfunction, which treats sick fat disease (SFD or adiposopathy)
- Treat excessive body fat, which treats fat mass disease (FMD)
- Treating diseases due to increased body fat and its adverse metabolic and biomechanical consequences may improve patient health, quality of life, body weight, and body composition

# Treatment

- Nutrition- The most appropriate nutritional therapy for weight loss should be safe, effective, and one to which the patient can adhere.
- Very low-calorie diets contain less than 800 kcal/day and require close medical supervision for safety reasons
- Low calorie diets range from 1200-1800 kcal/day (1200-1500 for women, 1500-1800 for men)



# Physical Activity

- Some physical activity is better than none
- At least 150 minutes (2.5 hours) per week of moderate physical activity or at least 75 minutes (1.25 hours) per week of vigorous intensity aerobic exercise = most health benefits, promote modest weight loss, and prevent weight gain
- > 300 minutes (5 hours) per week of moderate physical activity or 150 minutes (2.5 hours) per week of vigorous intensity aerobic exercise = promote more robust weight loss and prevent weight regain after weight loss

# Anti-Obesity Medications

- Adjunct to nutritional, physical activity, and behavioral therapies.
- 5-10 percent weight loss may improve both metabolic and fat mass disease.

# Medication Therapy

- FDA-approved Anti-obesity Medication Indications:
- Patients with obesity (e.g., BMI  $>30\text{kg/m}^2$ )\*
- Patients who are overweight (e.g., BMI  $>27\text{kg/m}^2$ ) with presence of increased adiposity complications (e.g., type 2 diabetes mellitus, hypertension, dyslipidemia)\*
- Anti-obesity medications are contraindicated pregnancy

# Medication Therapy

- Phentermine: Sympathomimetic approved in 1959. It is a DEA Schedule IV stimulant agent approved for short-term use (12 weeks). Some patients may lose about 5% of body weight.
- Phentermine/ topiramate- combination

# Medications

- Naltrexone /bupropion- Contrave
- Liraglutide: Glucagon-like peptide-1 receptor agonist aka. Saxenda
- Lorcaserin: Selective, serotonin (5-hydroxytryptamine) 2c receptor agonist that is a DEA Schedule IV agent that improves the sense of fullness.

# Bariatric Surgery

- **Sleeve**
- **Pro:** Improves metabolic disease; maintains small intestinal anatomy; micronutrient deficiencies infrequent
- **Con:** No long term data
- **Expected loss in percent excess body weight\* at two years: 50-70% (\*3-year data)**
- **Optimally suited for patients with:**  
Metabolic disease

# Bariatric surgery

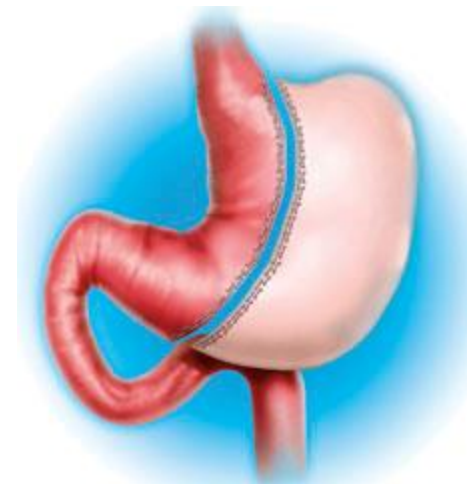
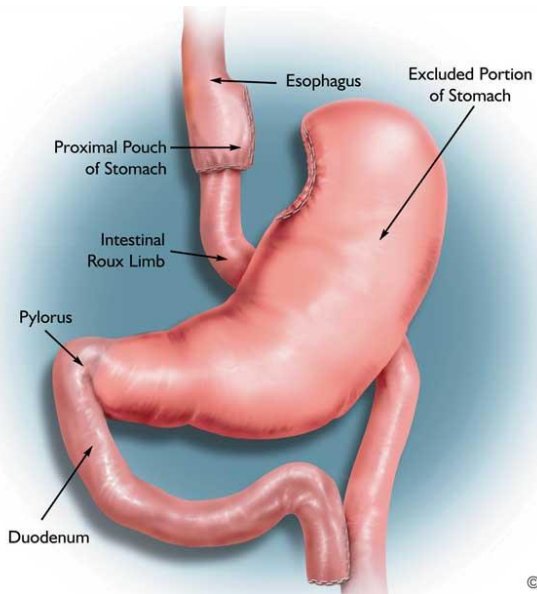
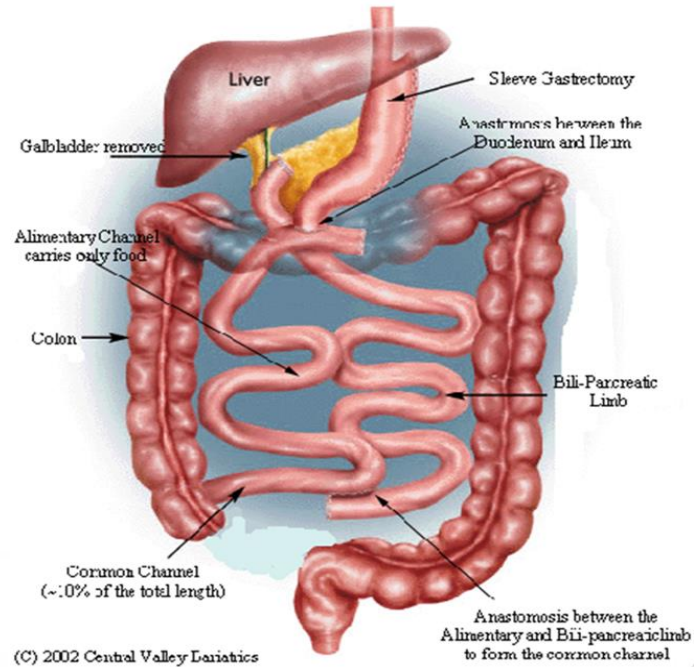
- **Gastric Bypass**
- **Pro:** Greater improvement in metabolic disease
- **Con:** Increased risk of malabsorptive complications over sleeve
- **Expected loss in percent excess body weight\* at two years: 60-75%**
- **Optimally suited for patients with: Higher BMI, GERD, Type 2 DM**

# Bariatric Surgery

- **Duodenal Switch**
- **Pro:** Greatest amount of weight loss and resolution of metabolic disease.
- **Con:** Increased risk macro-and micronutrient deficiencies over bypass
- **Expected loss in percent excess body weight at two years: 70-80%**
- **Optimally suited for patients with:** increased BMI and DM



# Bariatric Surgery



# Setting your expectations

Treatment	Avg. weight loss (% total) <sup>1,2</sup>	Long term % Excess Weight Loss <sup>1,2,3,4,5</sup>
Placebo	4-6%	0 %
Diet/behavior modification	8-12%	1.6% (10 Yrs)
Drug therapy	<10%	10%
Adjustable gastric banding	40-50%	<50%
Sleeve gastrectomy	70%	>50% (6 Yrs)
Gastric bypass	65-70%	>55% (10 Yrs)
Duodenal switch	over 70%	>70% (5 Yrs)

1.Eliosoff 1997

2.Sjostrom *NEJM* 2004,

3.Himpens J et al, Long term results of laparoscopic sleeve gastrectomy for obesity. *Ann Surg* (2010) Aug; 252(2):319-324

4.Higa et al Laparoscopic roux en y gastric bypass: 10 year follow up. *SOARD* (2011) 7:516-525

5.Topart P et al Five-year follow up after biliopancreatic diversion with duodenal switch. *SOARD* (2011) 7:199-205

# EndoBariatrics

- 1. Transoral incisionless fundoplication (TIF)
  - an advanced endoscopy procedure that provides relief from acid reflux (heartburn) symptoms
  - associated with chronic gastroesophageal reflux disease (GERD) without invasive surgery.
- 2. Intra-gastric balloon
  - this type of weight loss treatment can help you lose weight without invasive surgery.
- 3. Endoscopic Sleeve Gastroplasty
  - a weight loss procedure that uses an endoscopic suturing device to reduce the size of the stomach.

# Case Study

- PJ is a 33 y.o. year old male who has been struggling with his weight for more than 10 years. Reports a 100lbs weight gain which he blames on his work schedule. Work is retail, varied schedule, late hours, odd shifts. He is at his max weight 295. BMI 47.8. He feel his weight is starting to impact his quality of life. He is not interested in bariatric surgery . He wants to start with coming monthly for accountability and try an appetite suppressant.
- Hunger rating Scale: 6-7
- Satisfied after eating a meal- skips meals, larger portions
- Satisfied between meals- sometimes
- Highest adult weight 295
- Lowest adult weight 175
- Exercise: nothing consistent.
- Brk: skips most day. Reports brk about 3 days a week. Bagel or toast
- Lunch- skips
- Dinner: meat, veggie. Last night of work will be fast food.
- No soda or sweet tea.
- Fast food: 1-2 times week.

# Plan

- 130g carb control meal plan.
- work on meal planning and structure. Avoid skipping meals, reduce night time eating
- Consider supplementing one of his meals with a protein replacement product.
- Add Phentermine 15mg for appetite and craving control.
- Obtain, CMP, A1c, Lipid panel
- Discussed sleep study. He has several risk factors and we did discuss this at length. He is not interested in this at this time. Will hold on sleep study, but something he really should consider doing.

# Cast Study

## Last Weight from 10 Most Recent Encounters

- 09/04/19 99.8 kg (220 lb) Office Visit on 09/04/2019
- 08/05/19 105.7 kg (233 lb) Office Visit on 08/05/2019
- 07/02/19 113.2 kg (249 lb 8 oz) Office Visit on 07/02/2019
- 06/05/19 121.1 kg (267 lb) Office Visit on 06/05/2019
- 05/02/19 134 kg (295 lb 8 oz) Office Visit on 05/02/2019

Excellent job. Smaller more frequent meals. Higher protein and less carbs.

Phentermine 15mg daily

# Case Study

- PM, 50yo female Seen initially in March 2016
- Weight 344, BMI 54

# Case Study

- Chronic obstructive pulmonary disease
- Disorder of thyroid
- Diabetes mellitus type 2, controlled
- Hyperlipidemia
- Depression
- OSA on CPAP
- Morbid obesity with BMI of 50.0-59.9, adult
- Chest pain at rest
- CAD. She had CABG 2012. In 2013 - stenting of the pda with 2.5 x 8 DES Xience And in Feb 2013 had stenting of the RCA with 3.5 x 8 Xience DES.
- Metabolic syndrome



# Medications

1. Imdur 120mg daily
2. Ativan 1mg Qhs
3. Cozaar 25mg daily
4. Zarolxyn 2.5 mg daily
5. Metoprolol 50mg BID
6. Singular 10mg daily
7. Protonix 40mg d
8. Lyrica 100mg TID
9. Ranexa 1000mg BID
10. Zoloft 100mg daily
11. Aldactone 12.5mg BID
12. Trazadone 200mg prn
13. Mirapex 0.5mg BID
14. Potassium 20meq bid

1. Humalog; Inject 180 Units into the skin 3 (three) times daily before meals.
2. Lantus 180 u TID before meal
3. Metformin 1000mg BID
4. ALBUTEROL SULFATE HFA PRN
5. Cholecalciferol (VITAMIN D3) 5000 u
6. PLAVIX) 75 mg tablet
7. CRESTOR 20 MG tablet
8. FARXIGA
9. LASIX) 80 MG

- June 218
- **LAPAROSCOPIC DUODENAL SWITCH**
  - 316 @ surgery
  - 258 @ 3month
  - 217 @ 6 months
  - 177 @ 12 months
  - 163 @ 18 months = 181 lbs BMI 26 from >50

# Medication changes

- Levemir 15u Q hs
- Imdur 20mg daily (120mg)
- Cozaar 12.5mg daily (25mg)
- Metoprolol 12.5mg BID (50mg)
- Lyrica 100mg am 150mg pm ( TID)
- *Off Protonix, Zarolxyn, Renexa, Aldactone, Trazadone, Humlog, Lasix, Farxiga, KCL, Ativa)*

- END