UPDATES IN WEIGHT LOSS

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UCI Comprehensive Obesity Management Program

- Chronic disease with increasing prevalence - global epidemic

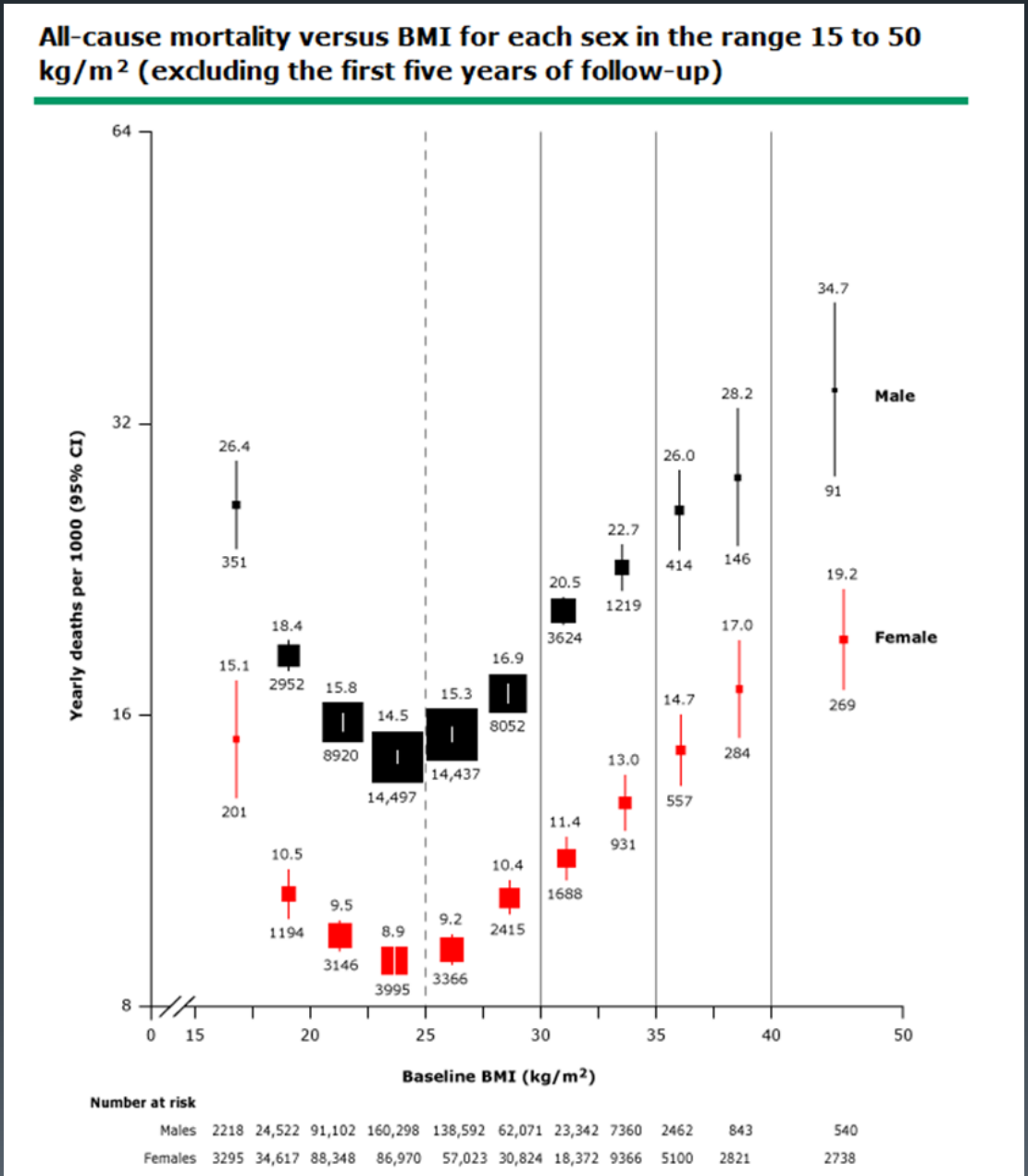
- In 2014, (CDC) reported 35.7% (78.6 M) of American adults as obese, and 17% of American children

- US had the highest rate of obesity for large countries. Mexico surpassed US, in 2013

- Screening for obesity Strongly recommended by:

  AHA; USPSTF; ACOG; TOS and AACE

  CMS mandates screening



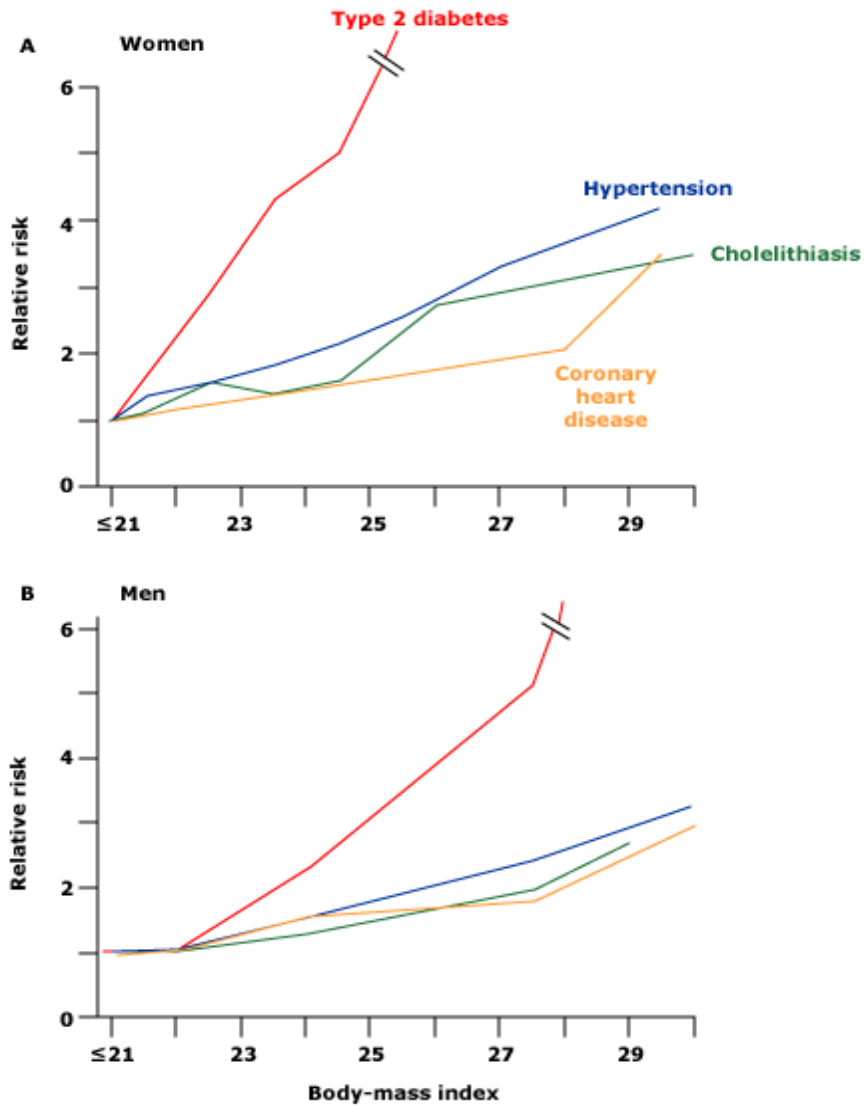
Lancet 2009; 373:1083

Age 35- 89

Above BMI of 25 :

mortality on average was approximately 30 percent higher for every 5 point increase in BMI

Body mass index and the risk of disease

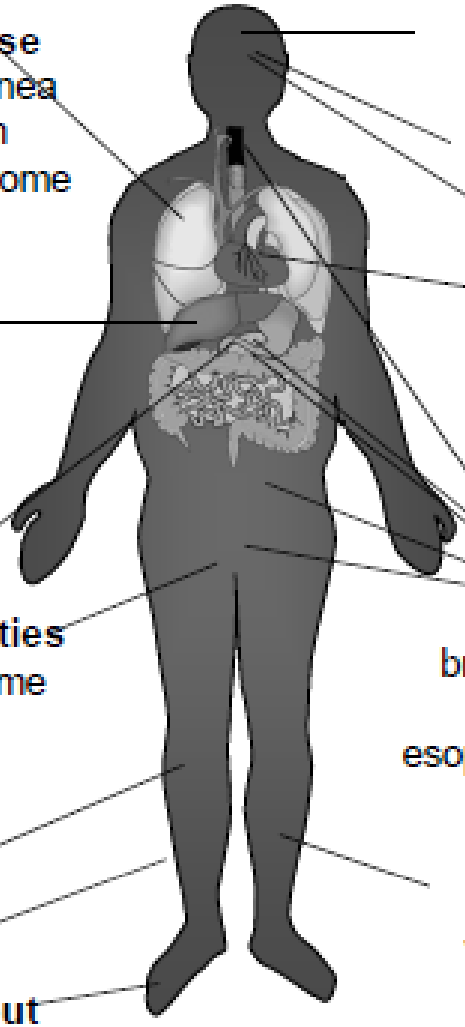


NEJM 1999 341-427

Medical complications of Obesity

- Diabetes
  >60% of DMII is obesity related
- Hypertension
- Hyperlipidemia
- CVD and stroke
- NAFLD/NAS
- Pancreatitis
- Obstructive sleep apnea
- Apnea/Hypoventilation
- GERD, Erosive esophagitis
- Cholelithiasis
- Cancers
- DVT, venous stasis
- Nephrolithiasis
- CKD
- Urinary incontinence
- Skin conditions
- Hormonal
  - PCOS
  - Hypogonadism
  - Fertility issues
- Gout
- Arthritis/Pain
- Depression
- Surgical treatment complications

Medical Complications of Obesity



Pulmonary disease
obstructive sleep apnea
abnormal function
hypoventilation syndrome

Nonalcoholic fatty liver disease
steatosis
steatohepatitis
cirrhosis

Gall bladder disease

Gynecologic abnormalities
polycystic ovarian syndrome
abnormal menses
infertility

Osteoarthritis

Skin

Gout

Idiopathic intracranial hypertension

Stroke

Cataracts

Metabolic syndrome

Coronary heart disease

CHF

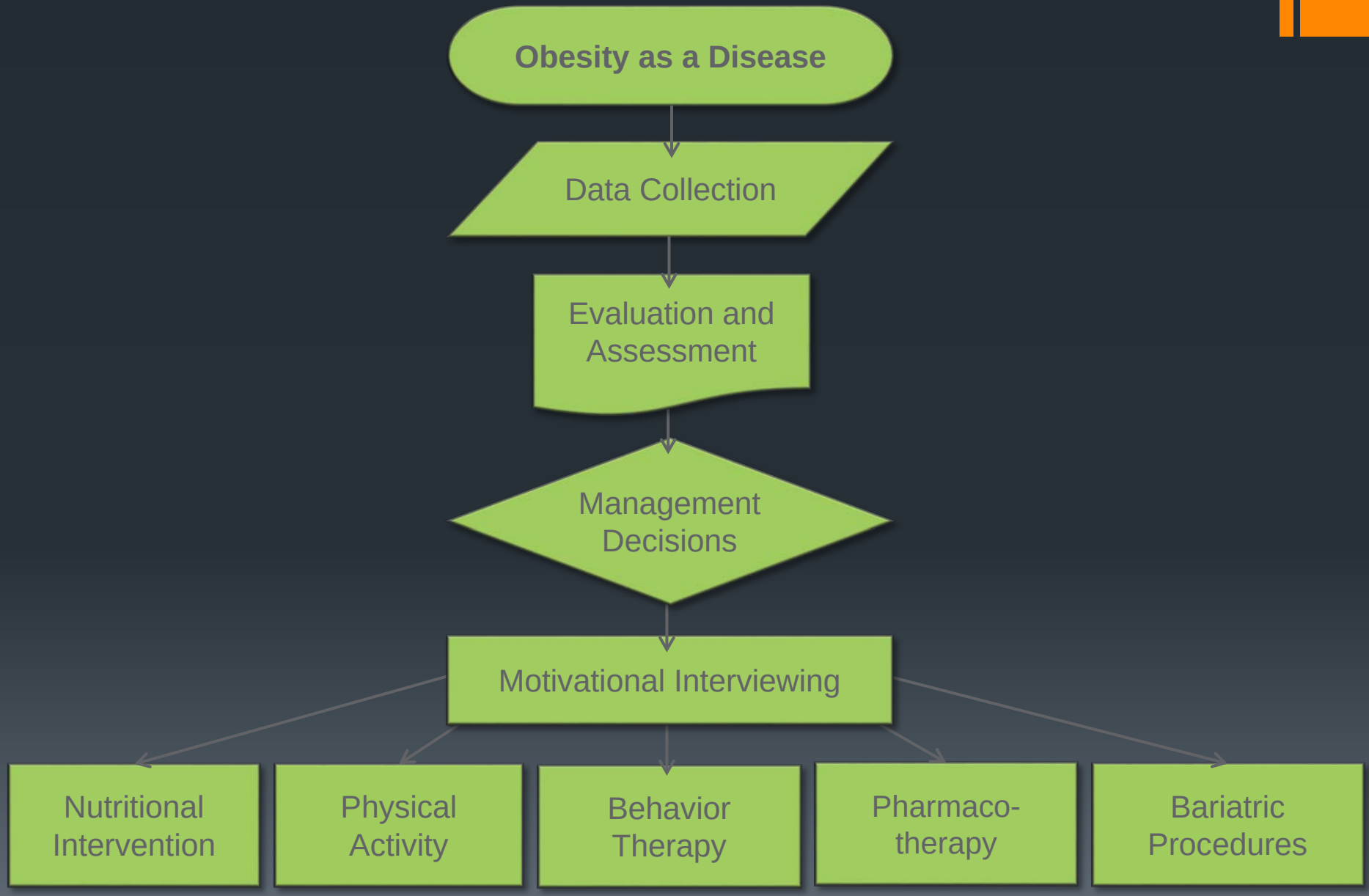
Dyslipidemia

Hypertension

Diabetes

Cancer
breast, colon, pancreas
uterus, cervix
esophagus, kidney, prostate

Phlebitis
venous stasis


Obesity as a Disease
Data Collection
Evaluation and Assessment
Management Decisions
Motivational Interviewing
Nutritional Intervention
Physical Activity
Behavior Therapy
Pharmaco-therapy
Bariatric Procedures

EVALUATION OF OBESITY

History

Sedentary Behavior and Obesity

- TV > 20 hours/week
  55% were obese

- TV < 5 hours/week
  11-14% were obese

- Computer >10 hours/week
  Increased odds of obesity

NOTE: Time spent reading was NOT related to obesity

Medication History:

Weight Gain

- Antidepressants
- Atypical Antipsychotics
- Anti-seizure
- Anti-histamines
- Anti-hyperternsives
- Insulin, sulfonylureas
- Anti retroviral
- Steroid Hormones
- Prednisone, contraceptive

Weight Loss

- Diet pills, OTC and prescription
- GLP1 analogs
- SGLT2 Inhibitor
- Metformin
- Bupropion
- Zonisamide
- Topiramate
- Thyroid hormones
- Ritalin, amphetamines

EVALUATION OF OBESITY

Physical Exam

Physical Assessment:

BMI

- BMI is kg/(m)2
- BMI ≥ 25 overweight
- BMI ≥ 30 obesity
- BMI 30-34.9 Class 1
- BMI 35-39.9 Class 2
- BMI ≥ 40 Class 3 or morbid/ severe obesity

- **Does NOT take in to consideration:**
  Gender, Race, Body Composition, Fat distribution

Abdominal (Visceral) Obesity

Waist Circumference

(A high waist circumference is associated with an increased risk for type 2 diabetes, dyslipidemia, hypertension, and CVD in patients with a BMI between 25 and 34.9 kg/m2)

- > 102 cm (40”) in men
- >88 cm (35”) in women

Waist : Hip

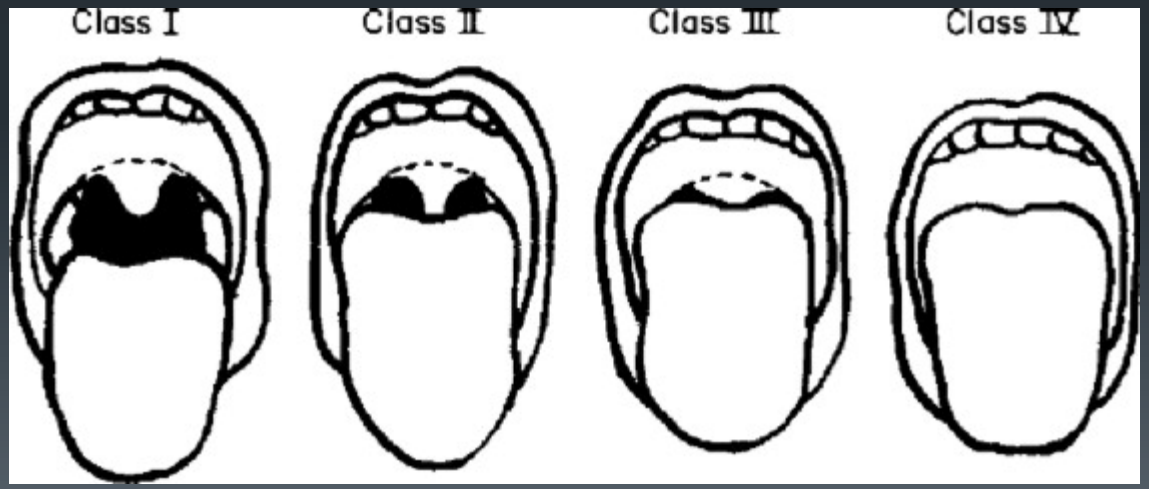
- >1:1 in Men
- >0.8 in women

BMI & Waist Circumference = 2 pivotal factors in metabolic risk (NHLBI)

Obstructive Sleep Apnea Evaluation

Neck Circumference >17” (M) and >16” (F) associate with Sleep Apnea

Mallampati Score



A 54 year old woman with BMI of 31 kg/m2 presents for a physical exam. Which of the following is most appropriate initial recommendation for weight loss ?

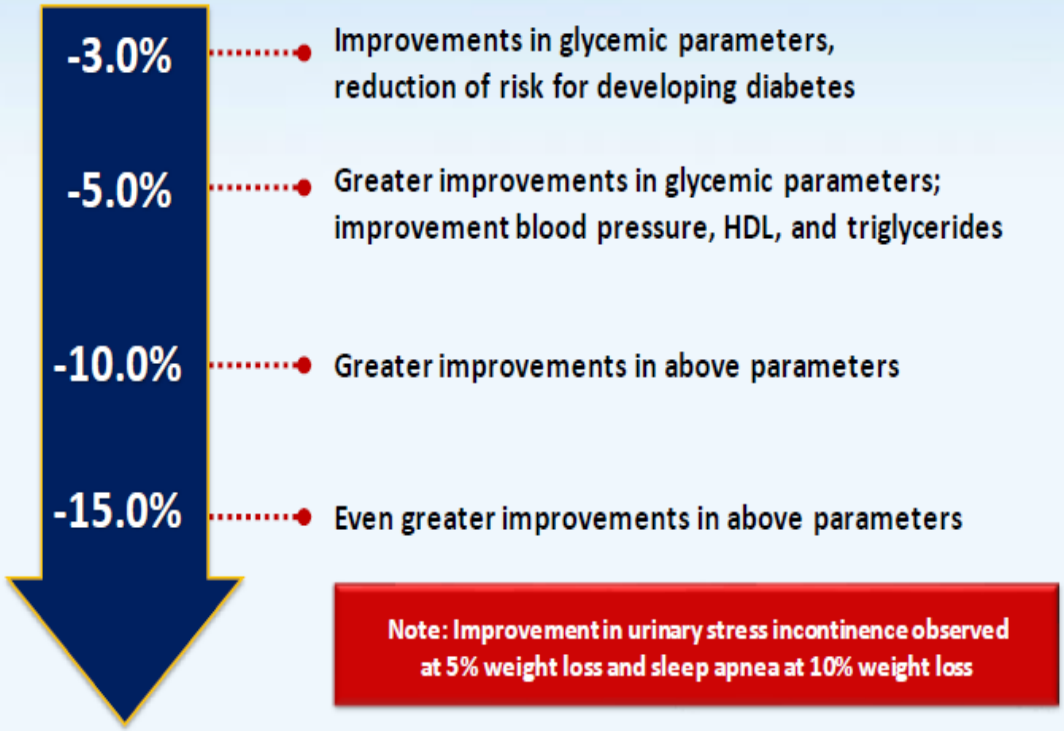
a) Recommend weight loss of 20% of current weight in 6 months, or 4-5 pound weight reduction/week.

b) Assess previous attempts at weight loss before recommending an option.

c) Reduction of caloric intake below 1000 kcal/day for a month to jumpstart her weight loss.

d) Refer for bariatric surgery consultation.

How Much Weight Do You Need to Lose? From the 2013 Obesity Guidelines...



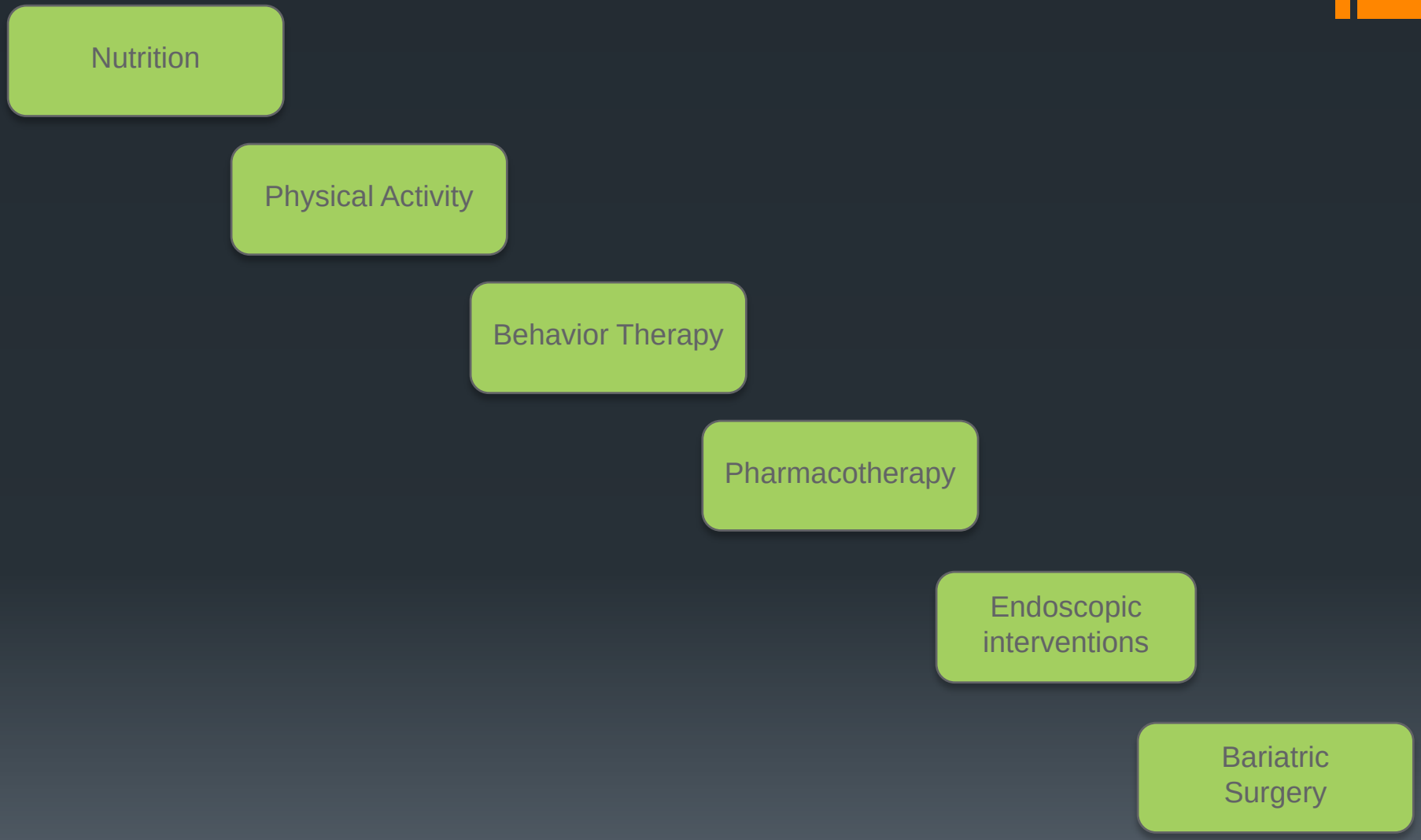
Note: Improvement in urinary stress incontinence observed at 5% weight loss and sleep apnea at 10% weight loss

Jensen MD, et al. 2013 AHA/ACC/TOS Guideline. *J Am Coll Cardiol*. 2014;63(25 Pt B):2985-3023.

10% Weight Loss Will Beneficially Improve the Following Conditions Affected by Obesity:

- Osteoarthritis
- Cancers of Breast, Esophagus, Stomach, Colon, Endometrium & Kidney
- CAD
- Carpal Tunnel Syndrome
- Chronic Venous Insufficiency
- Daytime Somnolence
- DVT
- DMII
- Kidney Disease
- Gall Bladder Disease
- Gout
- Heart Disorders
- HTN
- Impaired Immunity
- Impaired Respiratory Function
- Infection Following Wounds
- Infertility
- Liver Disease
- Low Back Pain
- OBGYN Complications
- Pain
- Pancreatitis
- Sleep Apnea
- Stroke
- Surgical Complications
- Urinary Stress Incontinence

TREATMENT OF OBESITY


Nutrition
Physical Activity
Behavior Therapy
Pharmacotherapy
Endoscopic interventions
Bariatric Surgery

DIETS FOR WEIGHT LOSS

Examples of Diet Programs

DASH: Dietary Approaches to Stop Hypertension

A balanced diet with no extreme percentages of macronutrients; low in sugar, salt, alcohol and saturated fat

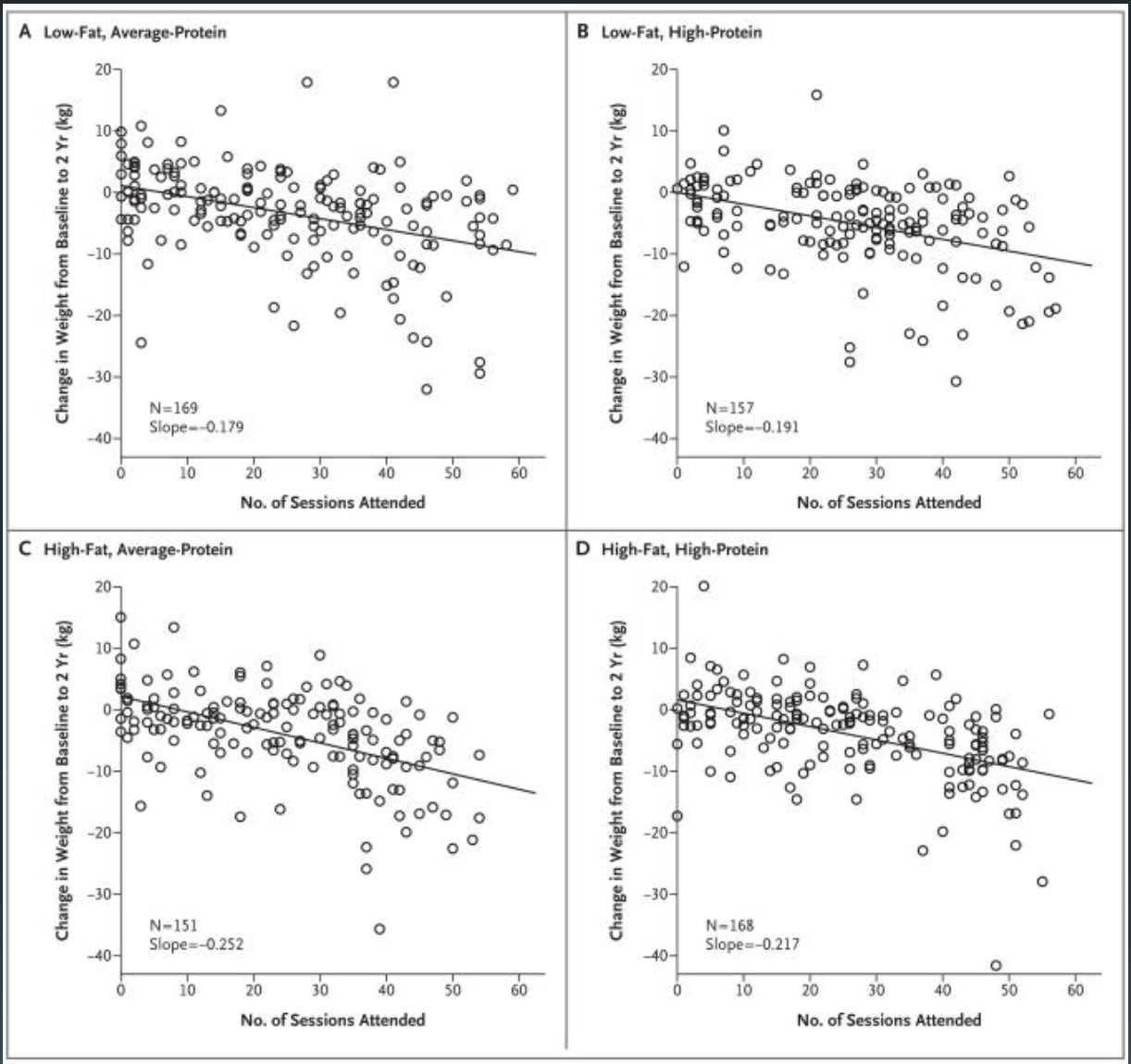
The Zone Diet: 40% C, 30% P, 30% F; focuses on lean meats (especially poultry)

South Beach Diet: 28% C, 33%P, 39% F; emphasizes healthy carbs, such as whole grains and certain fruits and vegetables

Atkins Diet: 6% C, 35% P, 59% F; severe carbohydrate restriction and a high-fat diet

Mediterranean Diet: 40% C, 17% P, 43% F; high amount of mono-unsaturated fats.

American Diabetes Association (ADA): 60% C, 20% P, 20% F



Change in Body Weight from Baseline to 2 Years According to Attendance at Counseling Sessions for Weight Loss, among the 645 Participants Who Completed the Study.There were no significant differences among the regression coefficients (P>0.2 for all comparisons; R^2 = 0.2 for total cohort). N Engl J Med. 2009

- September 2015 JAMA
  - 48 randomized trials
  - N = 7,286 (over weight and obese patients)
  - compared low fat vs low carb diets

At 6 months more weight loss on low carb diet

At 2 years no significant difference in weight loss

Conclusion – Any diet patient will follow

- November 2015 Annals of IM
  - Randomized trial
  - 119 completers
  - 12 months

Low carb diet was a little more effective for weight loss

Classification of Diets by Calories

- 0 – 400 Starvation; never recommended
- 400 – 800 VLCD (15 – 20 lb loss per 4 weeks)
- 800 – 1500 LCD (Low Calorie Diet)
- Above 1500 BDD (Balanced Deficit Diets)
  - Reduction of 500 – 1000 kcal/d from pre diet intake

Meal Replacement Diets

- Can be used as a complete diet program or as meal substitutes for 1 or 2 meals

- Have been shown be successful

- Used successfully in the “Action for Health in Diabetes” Program (AHEAD)

In the first year exercise, attendance at treatment session, and use of meal replacements showed the highest correlation with weight reduction

Lean Body Mass Protection

- Typical weight loss has been shown to be 75% fat and 25% lean body mass

- As a rule, on 800-1200 C LCD, use 1 gram of protein per kg IBW/d (65-70 gm/d)

- Over 1200, use 1 – 1.5 gram of protein per kg of IBW/d

Physical Activity and Obesity

For a patient seeking counseling prior to starting an exercise program, which of the following is the most appropriate advice?

a) Exercise alone (without dietary changes) typically results in significant weight loss of about 3-5 kg/week.

b) Exercise has been shown to result in significant weight loss, but it is not as important for weight maintenance.

c) Lifestyle activities, such as housework or parking the car further from the store, can achieve important health benefits

1 POUND of FAT = 3,500 KCAl

MET Categories

An expression of energy cost in reference to physical activity

- Light < 3 METs

  Driving your automobile = 2

- Moderate = 3-6 METs

  Walking 4 mph, brisk pace

- Vigorous > 6 METs

  Jogging 6 mph – 8 mph

  bicycling 14 – 16 mph

Exercise Dose-Response Curve

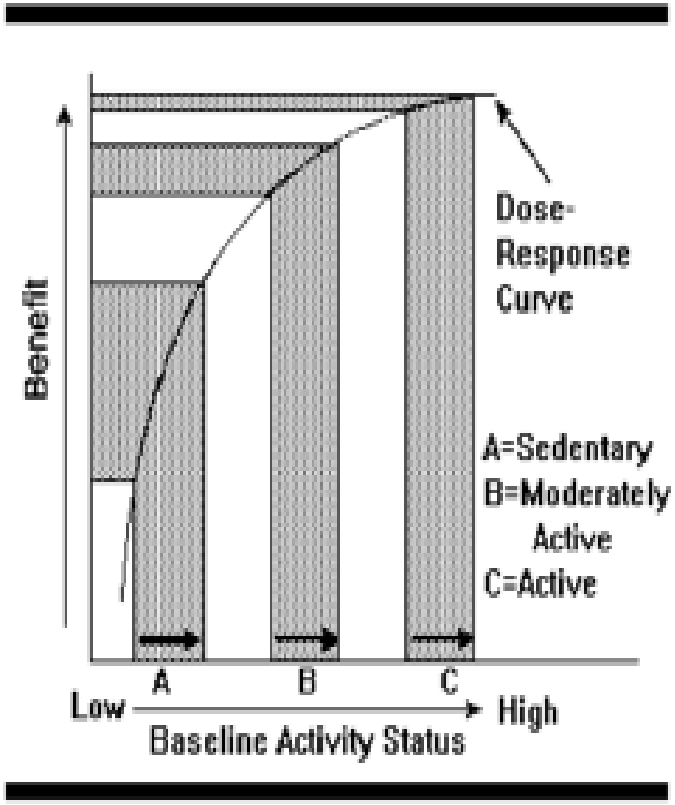


Figure 1.–The dose-response curve represents the best estimate of the relationship between physical activity (dose) and health benefits (response). The lower the baseline physical activity status, the greater will be the health benefit associated with a given increase in physical activity (arrows A, B, and C).

How Much Physical Activity Is Enough?

- General Health Benefit
  - Moderate aerobic exercise 150 min/wk (about 30 minutes 5x/wk) + strength training
- Active Weight Loss
  - 150-200 minutes per week
- Prevention of Weight Regain
  - 300-420 minutes per week

Basic Physical Activity Rx: FITTE

- Frequency
- Intensity
- Time
- Type
- Enjoyment

A 52 year old woman is ready to embark on a program to lose weight through caloric restriction and moderate physical activity. Which ONE of the following is true about behavioral techniques for weight loss?

a) Keeping a food diary is the most effective behavioral strategy for inducing weight loss.

b) Psychotherapy is an effective method of losing weight for most people.

c) Group weight loss classes (i.e. education with social support) are not as effective as individual counseling.

d) Behavioral strategies play only a small role in losing weight.

Behavioral Therapy

5 A's of Obesity Management

- **ASK** - Ask for permission to discuss body weight
  - Explore readiness to change
- **ASSESS** - Assess BMI, waist circumference, obesity stage
  - explore complications of excess weight
- **ADVICE** - Health risk of obesity
  - Benefit of weight loss
- **AGREE** - Realistic weight loss expectations, targets
  - details of treatment plans
- **ARRANGE / ASSIST** - Identifying and addressing barriers
  - Provide follow up

Lifestyle Changes Counseling Strategies

- Realistic goals–Set moderate short-term goals
- Make small increases in daily walking
- Decrease portion size
- Feel good about yourself and your success
- Self-monitoring –If doctors could counsel on one behavioral strategy it is self monitoring
- Raising self-awareness is absolutely necessary
- Patients underestimate calories by 1/3
- Overestimate physical activity by 1/2
- Journaling is important

Eating Attitudes and Behavior Assessments

- Binge Eating DO - Binges 2 times/week for 6 months, no compensatory behavior
- Night Eating DO - Consume 25-50% daily calories after evening meal
- Anorexia – distorted body image, fear of gaining weight, missed periods
- Bulemia - Binges at least 2 times/week for 3 consecutive months, followed by purging

For which of the following patients would the addition of pharmacotherapy for weight loss be appropriate, after attempts at lifestyle modification and caloric restriction have proven unsuccessful?

a) A 25 year-old woman with impaired glucose tolerance and a BMI of 25 kg/m2.
b) A 33 year-old man with hypertension and a BMI of 26 kg/m2.
c) A 30 year-old woman with knee osteoarthritis and a BMI of 26 kg/m2.
d) A 50 year-old man with normal blood pressure and glucose and a BMI of 31 kg/m2.

PHARMACOTHAY

Medications Approved for Long-term Obesity Treatment

MEDICATION	BRAND NAME	YEAR APPROVED
Liraglutide 3.0 mg	Saxenda	2014
Naltrexone-bupropion ER	Contrave	2014
Lorcaserin	Belviq	2012
Phentermine-topiramate ER	Qsymia	2012
Orlistat	Xenical *	1999

Phentermine

- Sympathomimetic effect – release norepinephrine from synaptic granules (effects thermogenesis and BMR)

- Works at level of central nervous system – hypothalamus and limbic system

- Appetite suppressant effect – anorectic

- FDA approval for only 12 weeks per year

- After 12 weeks, patients in the active treatment arm lost significantly more weight (-8.1 versus -1.7 kg with placebo)

Orlistat

- Doses: Xenical – 120 mg tid with meal or <30 min post
  Alli – 60 mg tid with meal
- Gastric and Pancreatic lipase inhibitor
- Inhibits uptake of up to 1/3 of ingested fat
- Needs to be used in accordance with low-fat, calorie controlled diet
- Average WT loss 8 kg vs 4 kg for placebo
- 44% of orlistat maintained 5% of initial WT loss at year 2 vs 24% placebo

Qsymia

- (Phentermine/ Topiramate)
- Dosing regimen: 3.75/23 mg; 7.5/46 mg; 11.25/69 mg; 15/92 mg
- Two - 1 yr long RCT's demonstrate 7.5 % and 9.5%
  - additional weight loss over placebo (CONQUER)
  - SEQUEL was 2 yr follow up study 10.9 vs 2.1 kg
- Improved BP, lipids, depression, glycemic control
- Contraindic: pregnancy, glaucoma, hyperthyroidism

Lorcacerin (Belviq®)

- Common name: Belviq®

- Mechanism: Serotonin 2C receptor agonist
  (fenfluramine was primarily at 2B receptor agonist)

- Clinical trials: 3 RCT's 1-2 years in length – 6000(n)
- Weight loss 1 year: 7.3 kg vs. 3.7 (control)
- Weight loss 2 year: 6.0 kg vs 3 kg.

- Greater reduction in A1C (-1%) in treated diabetics vs placebo; HTN; improvement in lipids

Lorcacerin (Belviq®)

- Common SE: headache, dizziness, GI changes (nausea)
- Rare SE: serotonin syndrome, priapism
- Particular caution in CHF patients

GLP-1 Agonists - Mechanism

- Enhance glucose dependent insulin release
- Suppress inappropriate glucagon release
- Delays gastric emptying
- Reduction in food intake directly acting on receptors in the hypothalamus and area postrema

GLP-1 Agonists LIRAGLUTIDE

- In a 56-week trial comparing 3 mg once daily with placebo injection in 3731 patients mean weight loss was significantly greater in the liraglutide group (-8.0 versus -2.6 kg with placebo
- Works synergistically with carbohydrate controlled dieting
- Nausea is fairly common but usually self-limited which is reason for titration schedule
- Be mindful of acute back pain or vomiting – D/C med and check pancreatic enzymes; medullary thyroid carcinoma in rats and mice

Naltrexone-Bupropion ER

- Bupropion a dopamine and norepinephrine reuptake inhibitor
- Stimulates POMC Neurontin
- Naltrexone - blocks autoinhibition of POMC neurons
- Mean change in body weight -5 to 6 percent versus -1.3 percent
- Caution: may lower seizure threshold, do not use in bulimia patients

Cycle of Weight Loss and Regain

- **Physiological adaptation to weight loss**

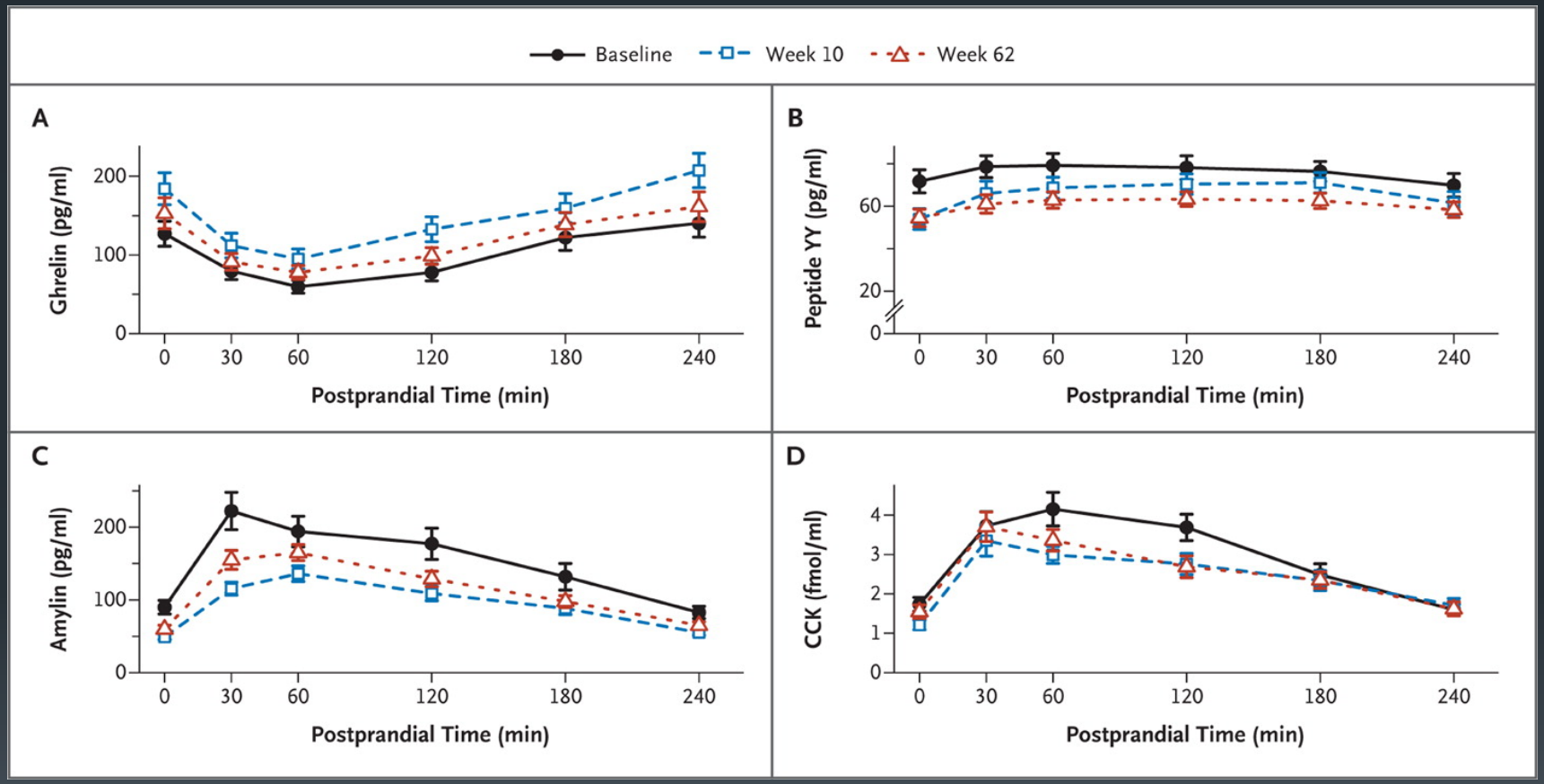
  - increased appetite and susceptibility to food cues and reward eating

- Total Energy Expenditure after weight loss

  - was approximately two-thirds of the daily TEE prior to weight loss far exceeding the reduction attributable to loss of body mass

  - less energy expenditure with physical activity

Mean (±SE) Fasting and Postprandial Levels of Ghrelin, Peptide YY, Amylin, and Cholecystokinin (CCK) at Baseline, 10 Weeks, and 62 Weeks.



Sumithran P et al. N Engl J Med 2011;365:1597-1604.

The NEW ENGLAND JOURNAL of MEDICINE

Mr. S. is a 45 year old man with a BMI of 49 kg/m2 type 2 diabetes, hypercholesterolemia and obstructive sleep apnea who has been unable to lose weight despite multiple attempts over the past 4-5 years. He is concerned about his long-term health and is considering bariatric surgery.

Which of the following statements about bariatric surgery is true?

a) Patients who undergo bariatric surgery require close follow-up for the first 2 years, but then can resume normal medical care and follow-up after that.

b) He would benefit from Roux-en-Y gastric bypass, a procedure which combines both restriction and malabsorption to achieve weight loss.

c) Like lifestyle modification and pharmacotherapy for obesity, there is no data on the long-term benefits of bariatric surgery.

d) If he undergoes adjustable banding surgery, he can expect to achieve a near normal BMI within 5 years.

Why “Do” Weight Loss Surgery?

- Because it works!
- When weight is lost comorbidities improve.
- Across the range of medical problems, about 90% of them will either improve or resolve.
- Long term mortality is reduced.

Mortality Reduction

- The August 23rd 2007 edition of New England Journal of Medicine provided breakthrough

- Sjostrom et al in the Swedish Obesity Study (SOS) show a 29% reduction in death at average follow-up of 10.9 years

- Adams et al in a retrospective study of 7900 patients at 7.1 years, 40% reduction in mortality; 60% in cancer death; 92% in DM death

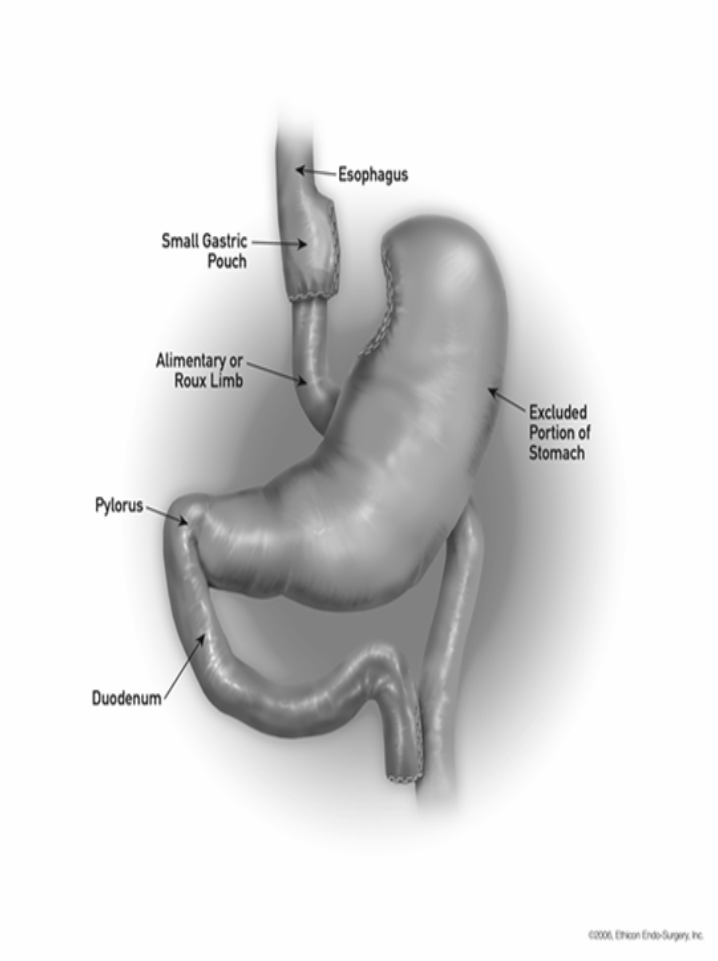
Who is a Candidate for WLS?

- NIH guidelines
- Patients with a BMI of 40 or greater

- Patients with a BMI of 35 or greater who also suffer from a severe medical condition related to obesity (sleep apnea, diabetes, HTN, etc…)

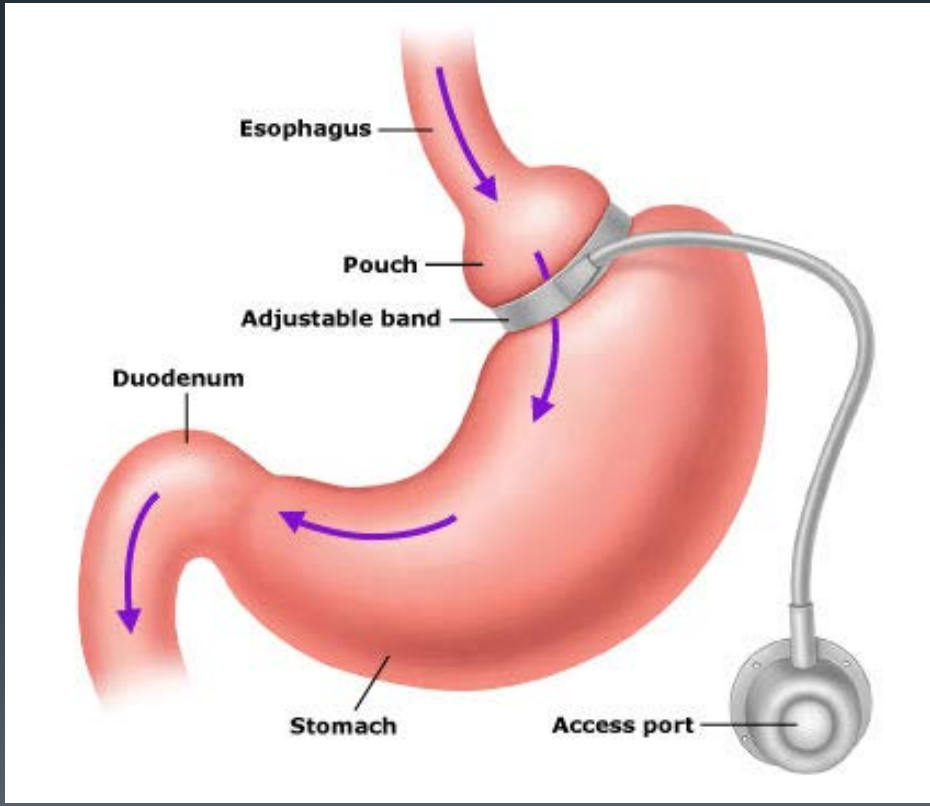
- A patient who is prepared and willing to commit to the lifestyle changes that will be necessary after surgery.

Gastric Bypass



- Rapid initial weight loss
- Most done laparoscopically
- Mainly restrictive; a little malabsorptive
- Longer experience in USA
- Most common WLS in the USA
- Surgery: 1 hour and 40 minutes
- Hospital stay: 1-3 days
- Full recovery: 4-6 weeks

Laparoscopic Adjustable Gastric Banding



- Band is placed around the top of the stomach

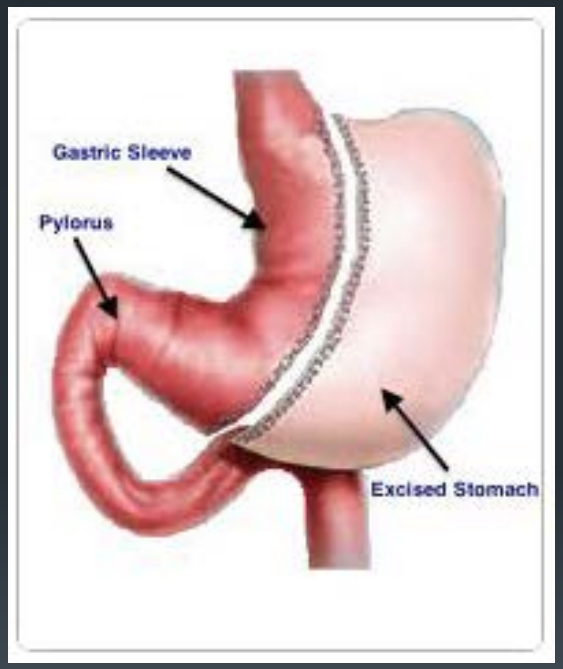
- **Induces weight loss three ways:**

• Creates a small “stomach pouch” that fills with a little food.

• “Squeezes” the stomach prolonging the sensation of fullness.

• Helps suppress appetite.

Laparoscopic Sleeve Gastrectomy



- Removes the “greater curve” (stretchy part)
- Nothing is bypassed so there is very little malabsorption
- Anatomy remains normal
- Stomach is much smaller - about the size/shape of medium banana
- Ghrelin decreases so hunger decreases
- Increasingly popular and fastest growing option

Endoscopic Treatments for Obesity

- **Endoscopic Sleeve Gatroplasty**

  - Uses trans oral endoscopy to apply sutures and reshape the stomach, thereby decreasing food capacity

- **Gastric Bypass Revision**

  - an endoscopic procedures designed to address weight gain in people over undergone Roux-en-Y gastric bypass surgery

- **Intragastric Balloon**

  - noninvasive treatment in which a small balloon is placed endoscopically in the stomach to provide a sensation of fullness and decreased food intake