Obesity 2022: Pharmacologic Management Throughout the Lifespan

Wendy L. Wright
DNP, ANP-BC, FNP-BC, FAANP, FAAN, FNAP

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Disclosures

- Speaker Bureau: Sanofi-Pasteur, Merck, Pfizer, AbbVie, Biohaven
- Consultant: Sanofi-Pasteur, Pfizer, Merck, GlaxoSmithKline, Seqirus, Idorsia, Bayer

Wright, 2022

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Objectives

- Upon completion of this lecture, the participant will be able to:
  - Discuss the health risks associated with obesity
  - Identify the various behavioral modalities utilized to assist with weight loss
  - Discuss pharmacologic strategies for weight stabilization or loss in the overweight or obese individual

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Definition of Obesity

"Obesity is defined as a chronic, progressive, relapsing, and treatable 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 Medicine, 2021 Definition of Obesity

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Obesity if Multifactorial

- Genetic
- Environmental
- Immune
- Endocrine
- Medical
- Neurobehavioral

Obesity Medicine, 2021
https://obesitymedicine.org/obesity-algorithm/ accessed 08-24-2021

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Today….

- 108 million Americans with hypertension
- 78 million adults in the United States qualify for a statin

- 108 million Americans living with obesity

yet…it is often not treated in the same way

Adult obesity facts. Centers for Disease Control and Prevention. Accessed March 1, 2021. https://www.cdc.gov/obesity/data/adult.html.
US Census Bureau. QuickFacts: United States. Accessed March 1, 2021. https://www.census.gov/quickfacts/fact/table/US#viewtop.

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Screening and Diagnosis

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Practical Diagnosis

- Weight
  - Easily understood by all
- Height
  - Allows you to calculate the BMI
- Look at medication list
- BMI

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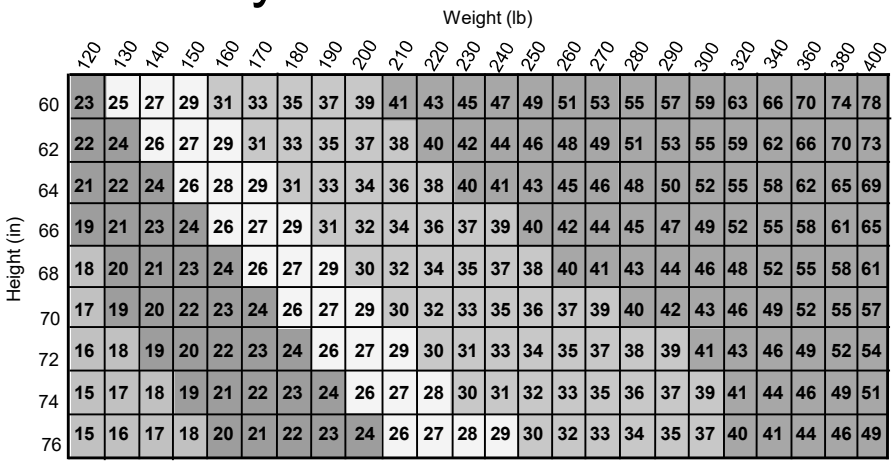
Body Mass Index Chart



www.obesityonline.org accessed January 1, 2007

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Determine Obesity Class and Disease Risk

BMI (kg/m^2)	Classification	Disease Risk* (Waist Circumference) Men ≤ 40 in, Women ≤ 35 in	Disease Risk* (Waist Circumference) >40 in, >35 in
<25.0-29.9	Overweight	Increased	High
30.0-34.9	Obesity I	High	Very High
35.0-39.9	Obesity II	Very High	Very High
> 40	Obesity III	Extremely High	Extremely High

* for type 2 diabetes mellitus, hypertension, and CVD

NHLBI Practical Guide. Oct 2000 Table 2, pg 10

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Practical Diagnosis

- Waist Circumference
  - Obtained by taking a measurement between the iliac crest and the bottom of the rib cage after mild exhalation
  - Waist circumference of > 102 cm (> 40 inches) in men or 88 cm (> 35 inches) in women is a essential component of the metabolic syndrome diagnosis

The Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. *JAMA*. 2001;285:2486-2497.

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Waist Circumference

- As the individual gets older, it becomes much more predictive of morbidity and mortality than the BMI
  - When waist circumference is 36 inches: 3 x more likely to develop diabetes
  - 40 inches: 12 x more likely

www.jhsph.edu/PublicHealthNews/Press_Releases/2005/Wang_waistsize.html accessed January 1, 2007

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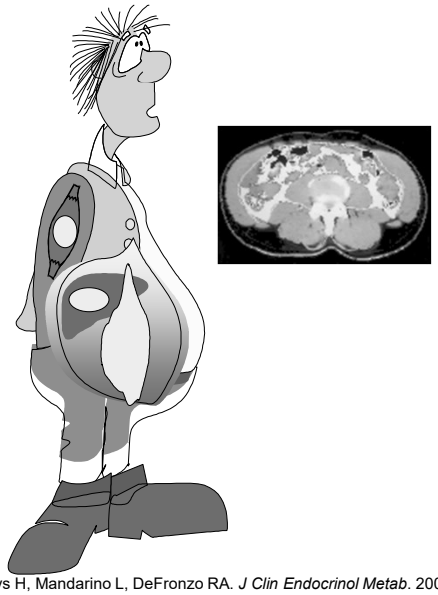
Fat Topography in Impaired Glucose Tolerance



Bays H, Mandarino L, DeFronzo RA. *J Clin Endocrinol Metab*. 2004;89:463-78..

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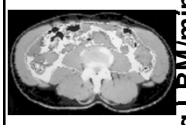
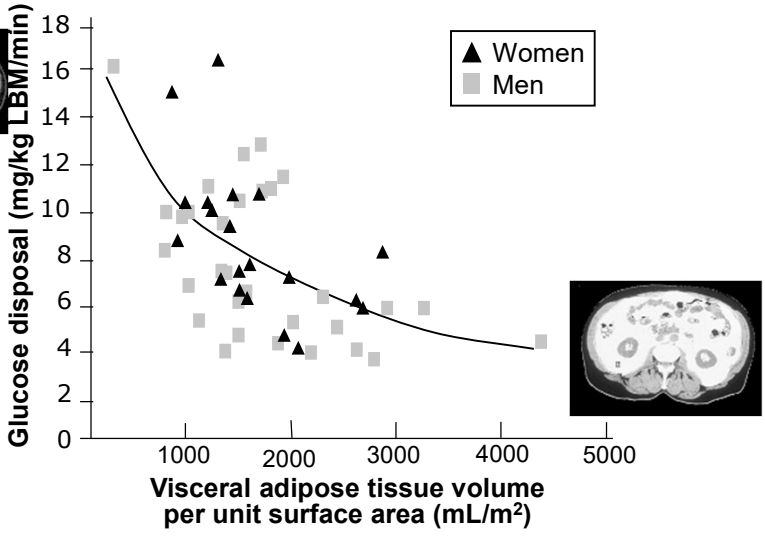
Relationship Between Visceral Adipose Tissue and Insulin Action





Banerji M et al. *Am J Physiol* 1997;273(2 pt 1):E425–E432.

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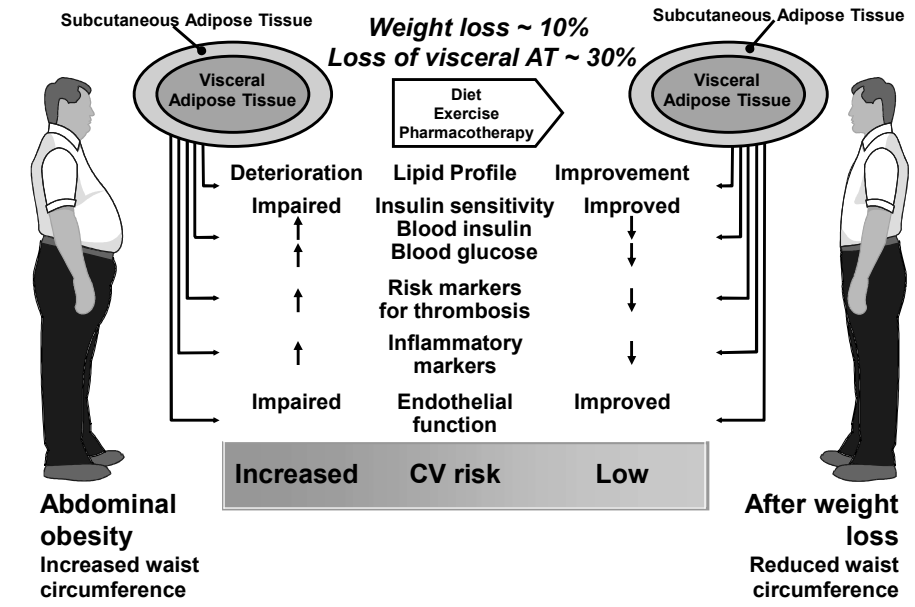
Adipose Tissue: Subcutaneous vs. Visceral



Adapted from Després J, et al. *BMJ.* 2001;322:716-720.

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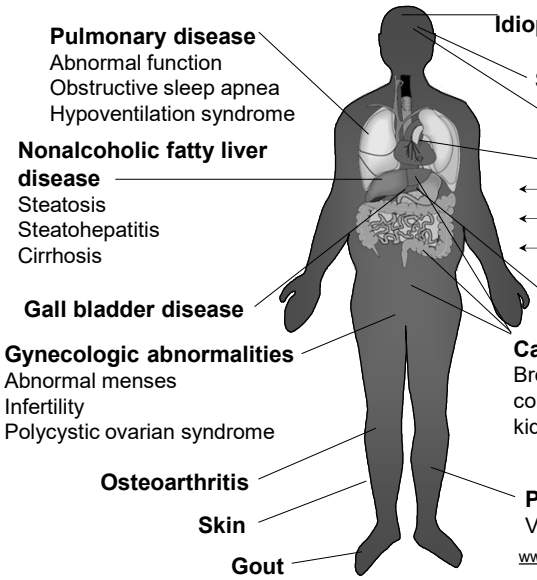
Medical Complications of Obesity



Pulmonary disease
Abnormal function
Obstructive sleep apnea
Hypoventilation syndrome

Nonalcoholic fatty liver disease
Steatosis
Steatohepatitis
Cirrhosis

Gall bladder disease

Gynecologic abnormalities
Abnormal menses
Infertility
Polycystic ovarian syndrome

Osteoarthritis

Skin

Gout

Idiopathic intracranial hypertension

Stroke

Cataracts

Coronary heart disease
← Diabetes
← Dyslipidemia
← Hypertension

Severe pancreatitis

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

Phlebitis
Venous stasis

www.obesityonline.org accessed January 1, 2007

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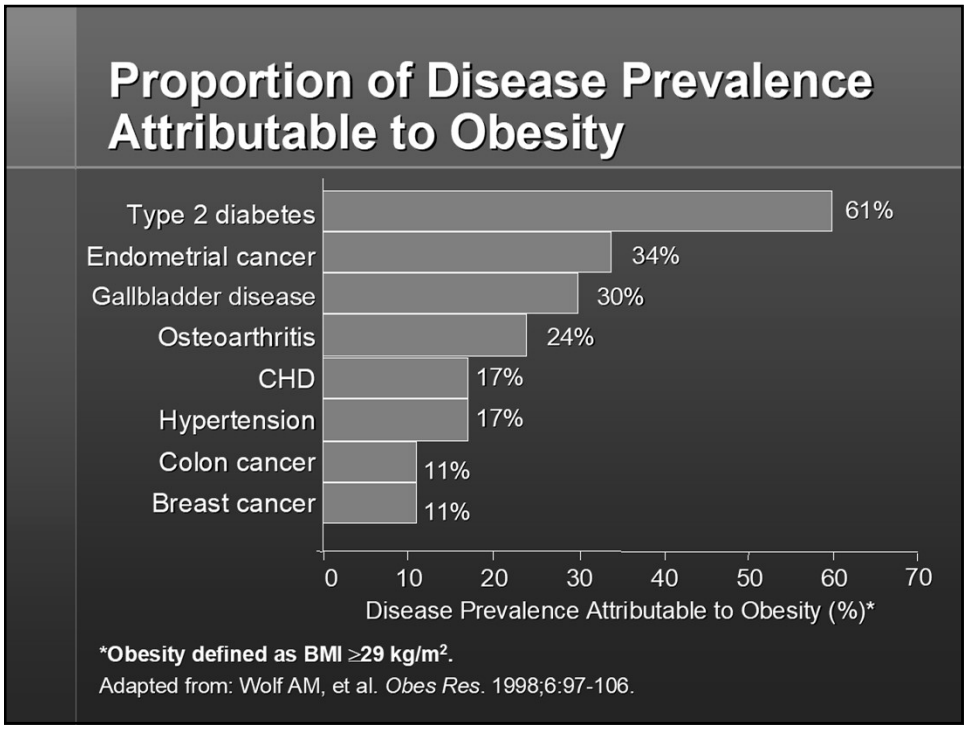

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Obesity is associated with 60 comorbidities, most of which are improved or reduced with weight loss

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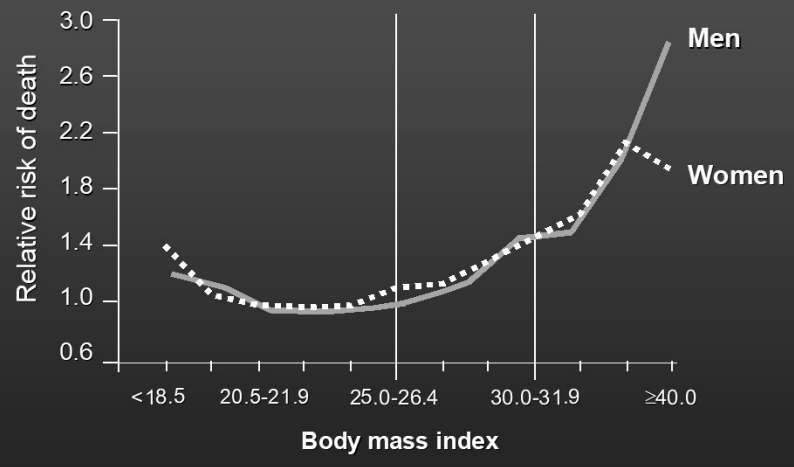
Relationship Between BMI and Cardiovascular Mortality



Adapted from: Calle EE, et al. *N Engl J Med.* 1999;341:1097-1105.

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New Goals of Weight Loss

"The initial goal of weight loss therapy for overweight patients is to decrease body weight by about 10%. . . Moderate weight loss [of this magnitude] can significantly decrease the severity of obesity-associated risk factors."

— NIH/NHLBI

NIH/NHLBI. September 1998; NIH publication no. 98-4083.

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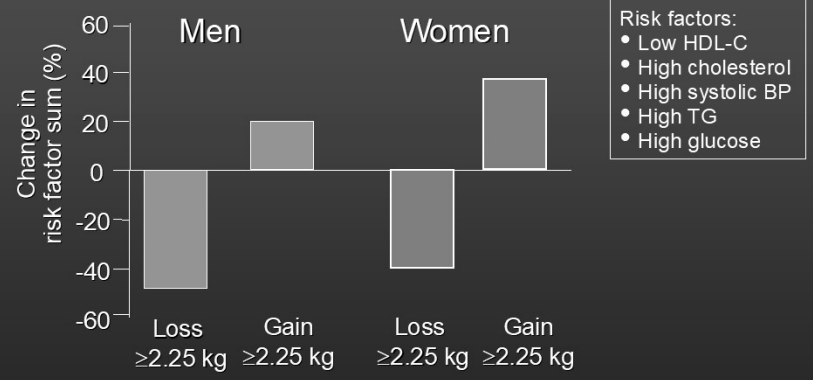
Change in Weight and CHD Risk Factor Clustering: Framingham Offspring Study



Weight Change Over 16-Year Follow Up

Adapted from: Wilson PW, et al. *Arch Intern Med.* 1999;159:1104-1109

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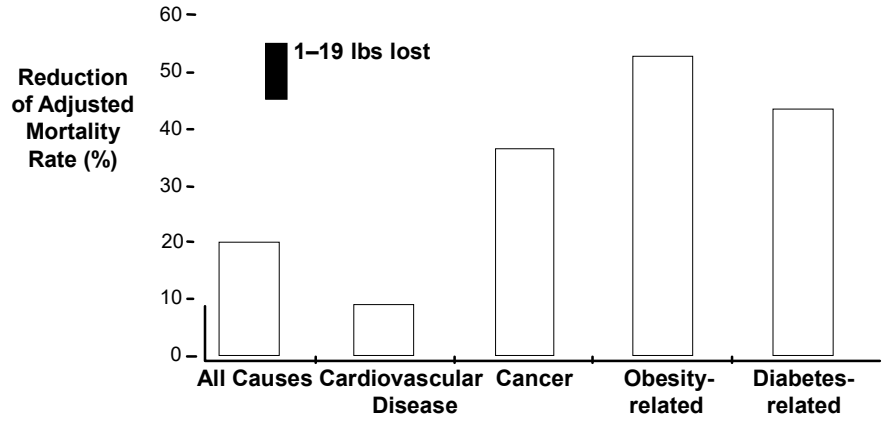
Intentional Weight Loss and Reduction in Mortality



Williamson DF, et al. *Am J Epidemiol*. 1995;141:1128–1141.

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Case Study

- BL – 52 year old female; struggled with obesity since teenager
  - Increase in weight with each pregnancy
  - Increase in weight with menopause
- PMH: Asthma, MDD, Hyperlipidemia, Obesity, history of breast cancer 1 year ago
- Medications:
  - Fluticasone/salmeterol 250mg/50mg 1 puff bid
  - Albuterol 2 puffs every 4-6 hours prn
  - Tamoxifen 20 mg once daily
  - Citalopram 20 mg 1 pill daily
  - Multivitamin daily

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Selected Medications That Can Cause Weight Gain

- Psychotropic medications
  - Tricyclic antidepressants
  - Monoamine oxidase inhibitor
  - Specific SSRIs
  - Atypical antipsychotics
  - Lithium
  - Specific anticonvulsants
- β-adrenergic receptor block

- Diabetes medications
  - Insulin
  - Sulfonylureas
  - Thiazolidinediones
- Highly active antiretroviral therapy
- Tamoxifen
- Steroid hormones
  - Glucocorticoids
  - Progestational steroids

SSRI=selective serotonin reuptake inhibitor

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Case Study…

- What role, if any, do you think her medication may be playing in her obesity?
  - Are there better medication options for her?

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NHLBI Guidelines: A Guide to Selecting Treatment for Obesity in Adults

Treatment	BMI (kg/m^2) Category				
	Overweight 25-26.9	**Overweight 27-29.9**	**Obesity (Class 1) 30-34.9**	**Obesity (Class 2) 35-39.9**	**Extreme Obesity (Class 3) ≥40**
Diet, physical activity, and behavior therapy	✓ *(With comorbidities)*	✓ *(With comorbidities)*	✓	✓	✓
Pharmacotherapy		✓ *(With comorbidities)*	✓	✓	✓
Surgery			✓ *(With comorbidities)*	✓ *(With comorbidities)*	✓ *(With comorbidities)*

Based on the NHLBI guidelines published in 2000.

BMI=body mass index; NHLBI=National Heart, Lung, and Blood Institute, division of National Institute of Health (NIH).

Table adapted from: The practical guide: identification, evaluation, and treatment of overweight and obesity in adults. NIH Publication 00-4084. National Heart, Lung, and Blood Institute Web site. Published October 2000. Accessed June 25, 2012.

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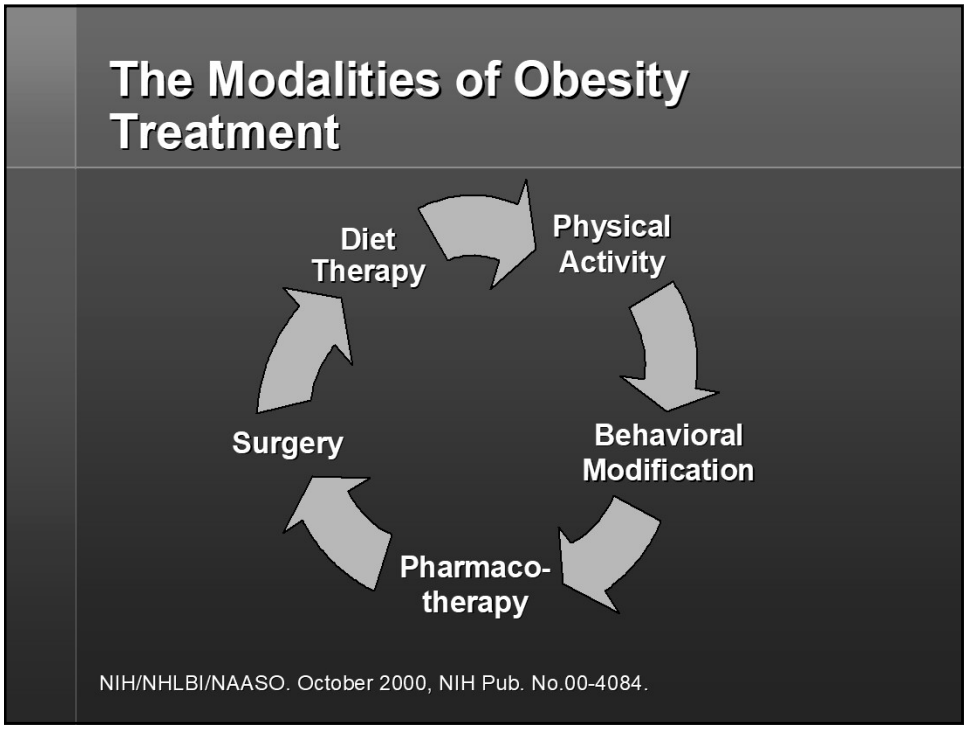
The Modalities of Obesity Treatment
Diet Therapy
Physical Activity
Behavioral Modification
Pharmaco-therapy
Surgery
NIH/NHLBI/NAASO. October 2000, NIH Pub. No.00-4084.

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Diet

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What To Do With Children

- ***Prevention Plus***
  - Children between the 85th - 94th percentiles BMI
  - Encourage 5 servings of fruits and vegetables/day
  - 2 hours or less of screen time
  - 1 hour or more of physical activity
  - 0 sugared drinks
  - Also discuss the importance of family meal time, limiting eating out, consuming a healthy breakfast, and preparing own foods

http://www.aap.org/obesity/USPSTF.html accessed 03-10-2011

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What To Do With Children

- ***Structured Weight Management*** *:*
  - *Used if prevention plus has not been effective*
  - BMI is between 95th - 98th percentiles
  - This approach combines more frequent follow-up with written diet and exercise plans

http://www.aap.org/obesity/USPSTF.html accessed 03-10-2011

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The New American Plate

- 2/3 or more of plate – vegetables, fruits, whole grains and / or beans
- 1/3 of plate – animal proteins

http://www.aicr.org accessed January 1, 2007

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Diet

- Very important component of any weight loss program
- Commonly utilized strategy to achieve weight loss

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Dieting: Which is Best?

Randomized trial comparing dietary interventions:

- Atkins — Very low carb, high fat
- Zone — Moderate carb, moderate fat
- Weight Watchers — High carb, moderate fat
- Ornish — High carb, very low fat

Study Question: How well do these very different popular diets work under realistic clinical conditions over a one-year period?
Answer: All diets had similar effect: 20-25% of subjects sustained modest weight loss beyond 1 year
What an individual will adhere to, not macronutrient combination, is the key

Dansinger MF. Tufts – New England Medical Center study, 2004

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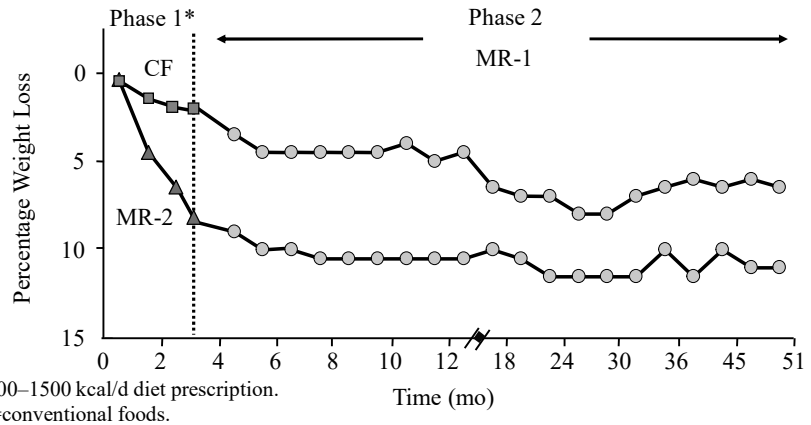
Meal Replacements Enhance Initial and Long-term Weight Loss



*1200–1500 kcal/d diet prescription.
CF=conventional foods.
MR-2=replacements for 2 meals, 2 snacks daily.
MR-1=replacements for 1 meal, 1 snack daily.

Ditschuneit et al. *Am J Clin Nutr* 1999;69:198.Fletchner-Mors et al. *Obes Res* 2000;8:399.

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Meta Analysis of Low-Fat (LF) vs. Low-Carbohydrate (LC) Diets

Outcome	6 months	12 months
Weight (kg)	-3.3 kg^{LC}	-1.0 kg
Systolic BP	-2.4 mmHg	-1.3 mmHg
Diastolic BP	-1.8 mmHg	-0.4 mmHg
Total Cholesterol	-8.9 mg/dl^{LF}	-10.1 mg/dl^{LF}
LDL Cholesterol	-5.4 mg/dl^{LF}	-7.7 mg/dl^{LF}
HDL Cholesterol	4.6 mg/dl^{LC}	3.1 mg/dl
Triglycerides	-22.1 mg/dl^{LC}	-31.0 mg/dl^{LC}

LC indicates a statistically significant difference in favor of low-carbohydrate diets.
LF indicates a statistically significant difference in favor of low-fat diets.

Nordmann et al. *Ann Intern Med*. 2006;166:285-293.

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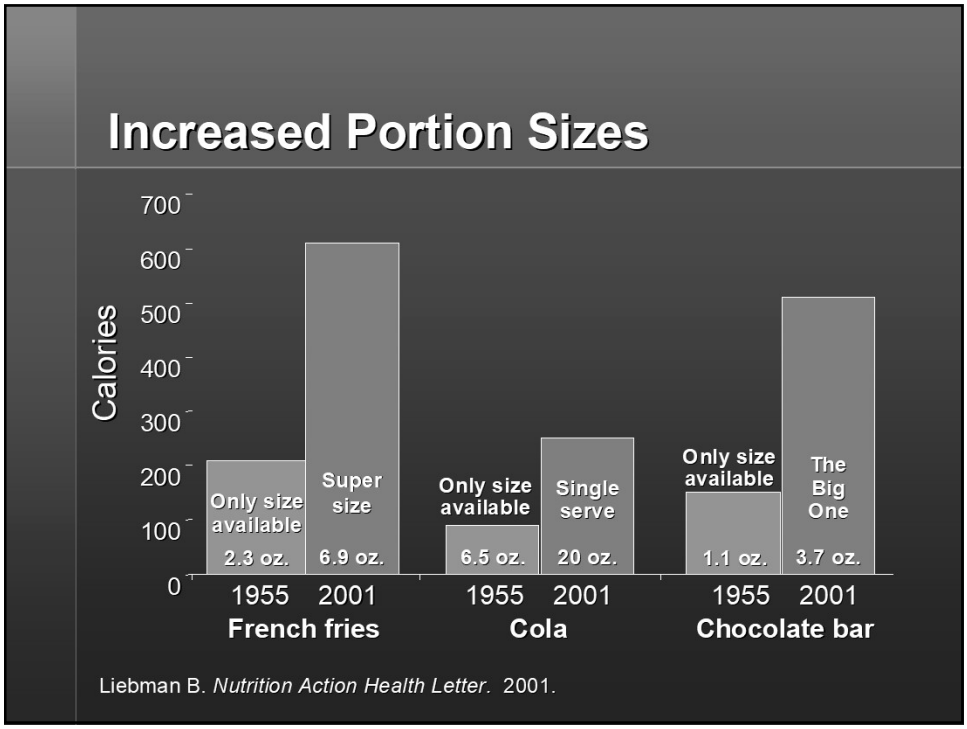

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Understanding Portion Sizes

1 oz. meat:	matchbox
3 oz. meat:	deck of cards or bar soap
8 oz. meat:	thin paperback book
3 oz. fish:	checkbook
1 oz. cheese:	4 dice
Medium potato:	computer mouse
2 tbs. peanut butter:	ping pong ball
1 cup pasta:	tennis ball
3 oz bagel:	hockey puck

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Portion Control

French fries

- Large 6 oz 540 calories

  vs.
- Small 2.5 oz 210 calories

<u>330 calorie difference</u>:
2x per month = 660 calories
x 12 months = 7920 calories
÷ 3500 calories per lb
= 2.2 lbs per year

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Substitutions

16 oz. cup of coffee with 2 oz. of:

- Light cream 120 calories

  vs.
- 2% milk 30 calories

<u>90 calorie difference</u>:
1x/day for 1 month = 2,700 calories
x 12 months = 32,400 calories
÷ 3500 calories per lb
= 9.2 lbs per year

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Look for…

- Binge-eating disorder
  - Up to 50% of individuals with obesity
  - Lisdexamphetamine is approved
- Night-eating syndrome
  - 25% of calories consumed after evening meal
  - Up to 5% of US population
  - Topiramate or sertraline (un-approved use)

<u>https://obesitymedicine.org/obesity-algorithm/</u>
accessed 08-24-2021

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Behavioral Modification

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What Suggestions Do You Make?

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Success of Behavioral Modification

- Meta-Analysis of 72 studies
  - Average sample size: 71 people/study
  - Weeks in treatment: 8.4 - 21.3
  - Average weight loss (kg): 3.8 - 22.0 (8.4 - 48 pounds)
  - Approximately 10 - 24% of individuals drop out of program
  - Follow-up performed: 15 - 71 weeks
  - Average weight loss at follow-up (kg): 4.0 - 12.1 (8.8-26.6 pounds)

Adapted from Bray, G.A. (1998). Contemporary Diagnosis and Management of Obesity: Handbooks In Healthcare Co., Newtown, Pennsylvania.

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Exercise

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Physical Activity is a Prescription for the Majority of Patients

US Adults:

- 40% no leisure time physical activity
- 23% some activity but less than Surgeon General's recommendations
- 15% meet Surgeon General's recommendations
- 23% participate in vigorous activity

www.healthypeople.gov/Document/HTML/Volume2/22Physical.htm accessed January 1, 2007

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We Have Become Sedentary

- A child who spends more than 3 hours per day on any sedentary activity is 50% more likely to develop obesity than children who watch < 2 hours per day[1]
- Children, ages 8 to 18, spend more time (44.5 hours per week) in front of a computer, a television, and video games than any other activity in their lives except for sleeping[2]

[1]**Tremblay, M.S.**, Willms, J.D. (2003). Is the Canadian childhood obesity epidemic related to physical inactivity? International Journal of Obesity and Related Metabolic Disorders 27, 1100-1105

[2]Kaiser Family Foundation, 2005 http://www.mediafamily.org/facts/facts_tvandobchild.shtml accessed January 1, 2007

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Develop a Patient-Focused Exercise Program

- Amount of Exercise Needed:
  - 30 minutes daily on most days of the week per surgeon general

http://www.cdc.gov/nccdphp/sgr/summ.htm accessed on January 1, 2007

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A Focus on Walking

- Walking is easy and beneficial, and as effective as structured exercise program[1] (no gym needed!)
- Compared to vigorous activity, walking (moderate intensity) provides similar health benefits[2]
- Short bouts (10 minutes) add up and are beneficial[3]

1. JAMA.1999;281(4):327-334
2. N Engl J Med 2002; 347 (10):716-725, Sept 2002
3. Jakicic Int J Obesity 1995, 19,893:901

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How to Measure Moderate Intensity

Borg Scale

Easiest way to translate "moderate" intensity

	6	
	7	Very, Very Light
	8	
	9	Very Light
Moderate	10	
	11	Fairly Light
	12	
	13	Somewhat Hard
Vigorous	14	
	15	Hard
	16	
	17	Very Hard
	18	
	19	Very, Very Hard
	20	

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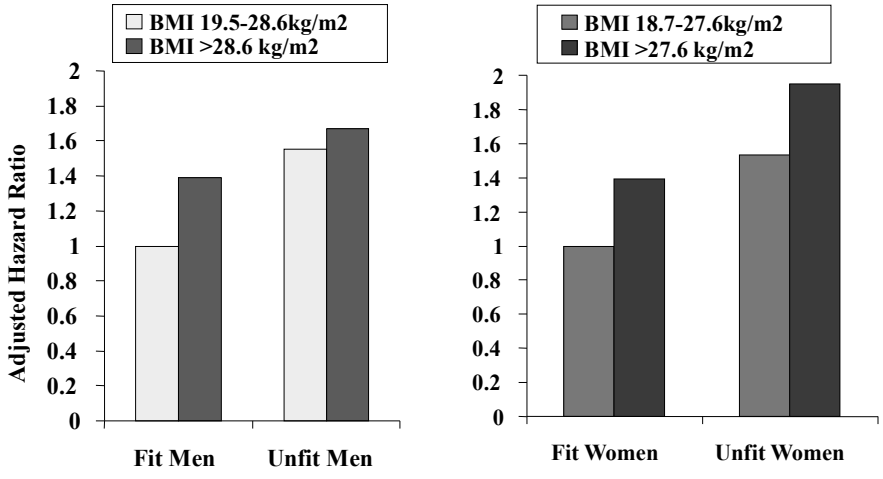
Fitness, Fatness, and Mortality from Cardiovascular Disease



Stevens et al. *Am J Epidemiol*. 2002;156:832-841.

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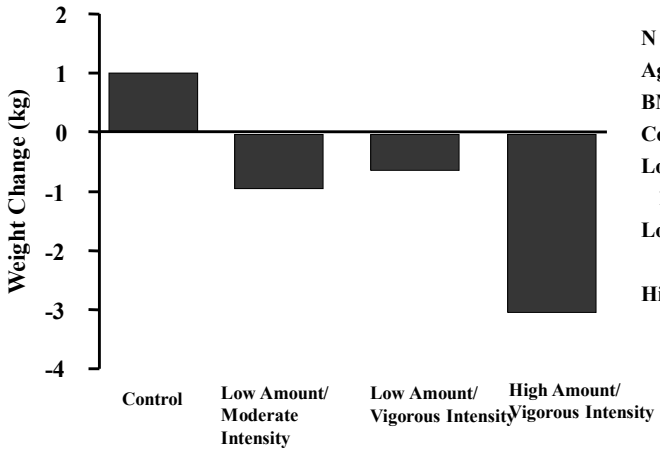
Weight Change Over 8 Months With Different Levels Of Physical Activity



N = 120 (65 men)
Age = 52.8 yr
BMI = 29.7
Control = No activity
Low Amount/Moderate=
12 miles/wk walking at 40%-55%
Low Amount/Vigorous=
12 miles/wk jogging at 65%-80%
High Amount/Vigorous=
20 miles/wk jogging at 65%-80%

Slentz et al. *Arch Intern Med* 2004; 164:31-39.

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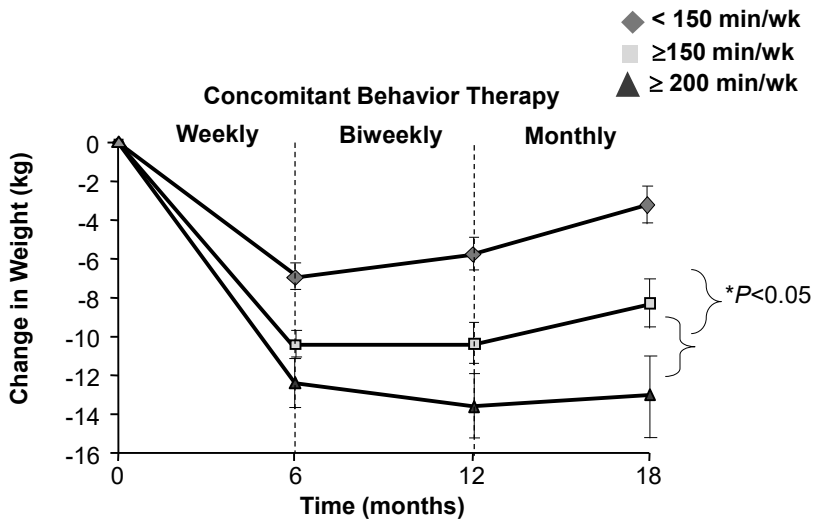
Considerable Physical Activity Necessary for Weight Loss Maintenance



Jakicic et al. *JAMA* 1999;282:1554.

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Medications

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Other Major Messages from 2013 Obesity Guidelines

- Who needs to lose weight?
  - BMI $\geq$30 kg/m^2 or BMI $\geq$25 kg/m^2 with a risk factor (eg., elevated waist circumference)
- You don't need to get your patients to an ideal weight. Modest weight loss has major health benefits.
- There is no magic diet for weight loss. It's about a calorie deficit. Choose the diet composition based on the patient's health status and personal preference.
- Everyone who needs to lose weight should have access to a comprehensive lifestyle intervention program with 14 sessions in 6 months and follow-up for a year.
  - If your patient doesn't have access to a comprehensive program in a medical or community setting, a commercial program with an evidence base to recommend it is acceptable.

Jensen MD, Ryan DH, Apovian CM, Ard JD, Comuzzie AG, Donato KA, Hu FB, Hubbard VS, Jakicic JM, Kushner RF, Loria C, Millen BE, Nonas CA, Pi-Sunyer FX, Stevens J, Stevens VJ, Wadden TA, Wolfe BM, Yanovski SZ. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. *Circulation. 2013;00:000–000.*

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History of Medications Utilized for the Treatment of Obesity

Date	Medication	Problems
1890's	Thyroid	Hyperthyroid
1930's	Dinitrophenol	Cataracts and Neuropathy
1930's	Amphetamines	Addiction
1960's	Digitalis and Diuretics	Death
1970's	Aminorex	Pulm Htn
1996-7	(Dex)Fenfluramine and Phentermine	Valvular disease

Adapted from Bray, G.A. (1998). Contemporary Diagnosis and Management of Obesity: Handbooks In Healthcare Co., Newtown, Pennsylvania.

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Pharmacotherapy

Why Use Pharmacotherapy?

- Rationale:
  - Patients can lose an average of 4-10% more with medication than diet and exercise alone

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Older Pharmacotherapies

Agent	Mechanism	Approval	Comments
Phentermine	Central noradrenergic	Short-term use DEA Schedule IV	Rare cases of pulmonary HTN and valvular heart disease have been reported
Diethylproprion	Central noradrenergic	Short-term use DEA Schedule IV	Rare cases of pulmonary HTN have been reported
Orlistat	Peripheral pancreatic lipase inhibitor	Long-term use Not scheduled	Monitor renal function in patients at risk of renal impairment

DEA= Drug Enforcement Agency.

Diethylpropion HCl [package insert]. Corona, CA: Watson Laboratories, Inc.; 2012; Xenical [package insert]. South San Francisco, CA, Genentech, 2012; Phentermine - Adipex-P [package insert]. Horsham, PA: Teva Select Brands; 2013.

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Orlistat

Indications and Dos

Approved by FDA, 19

Approved in adolesc

Indication: BMI ≥30 kg/m^2 or BMI ≥27 kg/m^2 with other risk factors

Dosing:

- Rx: 120 mg TID with each meal
- OTC: 60 mg TID with each meal

Advise pati

- Nutriti… die…; a… fat
- Take … vitam…

Advise a Moderate fat diet

Recommend a multivitamin

…ntraindications and …Warnings

Contraindicat…

- Pregnanc… syndrome

- Warnings:
  - Decrease… rare case… increase…

Advise about bowel effects

- Side Effects
  - Oily spotting, flatus with discharge, fecal urgency, fatty/oily stool, oily evacuation, increased defecation and fecal incontinence

Xenical [package insert]. South San Francisco, CA. Genentech, 2012. Alli [package insert]. Moon Township, PA. GlaxoSmithKline, 2011.

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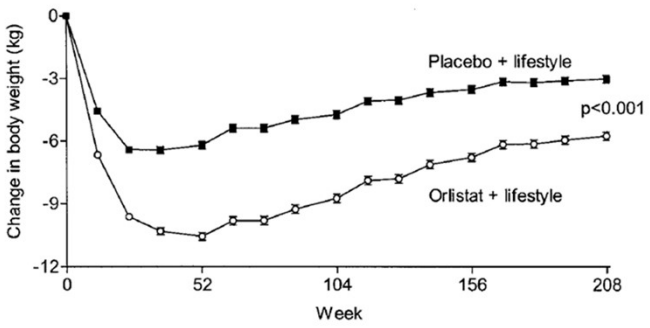
Orlistat Plus Lifestyle Intervention for the Prevention of T2DM in Obese Patients

4 year randomized placebo-control trial of 3,305 obese patients



"DPP-type" intervention: –3.0 kg

Orlistat + "DPP-type" intervention: –5.8 kg

DPP, Diabetes Prevention Program; T2DM, type 2 diabetes.
Torgerson JS, et al. *Diabetes Care*. 2004;27:155–161.

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Recently Approved Pharmacotherapies

Agent	Mechanism	Approval	Comments
Lorcaserin	Specific 5-HT_{2c} (serotonin) receptor agonist	Approved June 2012 DEA Schedule IV	Generally well tolerated, not recommended in patients with severe or end-stage renal impairment
Phentermine/ Topiramate ER	Sympathomimetic Anticonvulsant (GABA receptor modulation, carbonic anhydrase inhibition, glutamate antagonism)	Approved July 2012 DEA Schedule IV	Requires dose titration; contraindicated in glaucoma; not recommended with history of kidney stones

PULLED FROM MARKET

DEA= Drug Enforcement Agency.
http://www.fda.gov/Drugs/default.htm. Accessed May 6, 2014.

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Phentermine/Topiramate ER

- Indication
  - BMI of ≥30 kg/m^2 (obese), or ≥27 kg/m^2 (overweight) with at least 1 weight-related comorbid condition (eg, HTN, dyslipidemia, type 2 diabetes)
- Dosing
  - Phentermine 3.75 mg/topiramate 23 mg extended-release daily for 14 days then increase to 7.5 mg/46 mg daily. Maximum dose is 15 mg/92 mg
  - Discontinue if 5% weight loss is not achieved after 12 weeks on maximum daily dose of 15 mg/92 mg

ER, Extended Release
Qsymia [package insert]. Mountain View, CA: Vivus Inc.; 2012.

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Phentermine/Topiramate ER

(cont.)

- Contra
  - Pre… …oma, hyperthy…
    dur… …g MAOIs
- Warni…
  - Fetal toxicity
  - Increased heart rate
  - Suici… …mood and sleep disorders
  - …coma
- …betes meds
- …gram in place, pregnancy testing for those of childbearing potential advised before and during use

Dose titration required

Discuss paresthesias and taste disturbance

Obtain pregnancy test before prescribing and monthly

Rare, serious side effects

Qsymia [package insert]. Mountain View, CA : Vivus; 2012.

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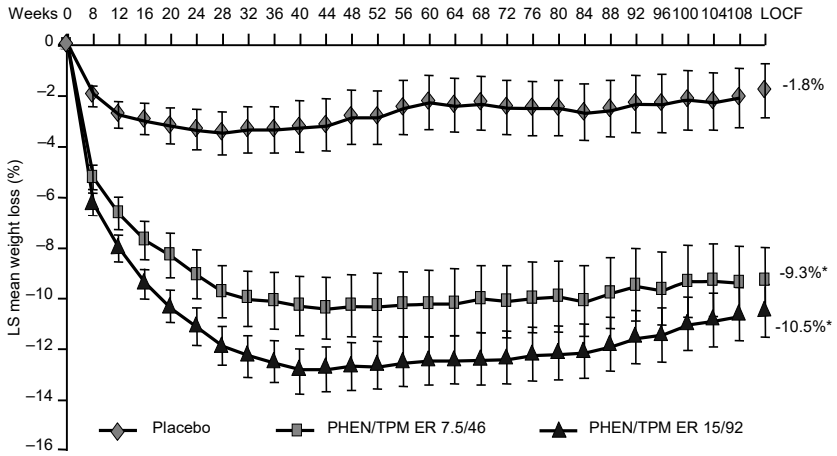
Phentermine/Topiramate ER on Weight Loss at 2 Years



Wright, 2022

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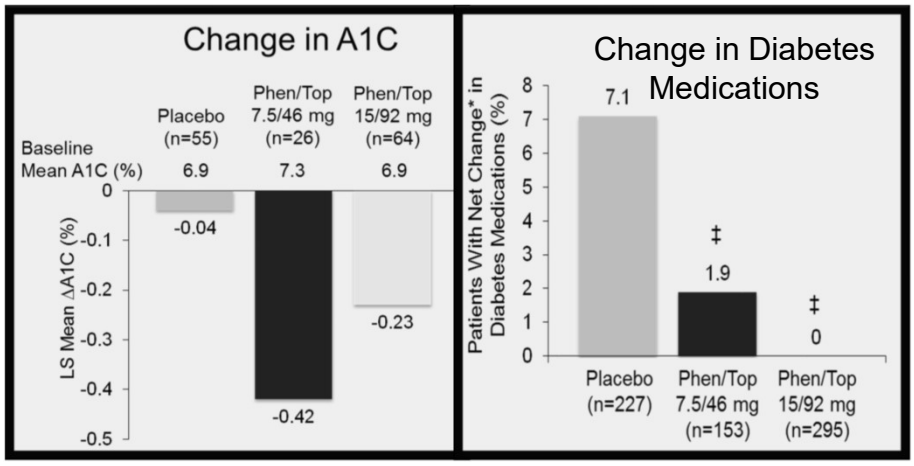
Effects of Phentermine/Topiramate ER in Patients with T2DM: 2 years of treatment



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Phentermine/Topiramate ER: Most Commonly Reported Adverse Events

Adverse Event (%) (N=3879)	Placebo	Phen/Top ER 7.5/46 mg
Paresthesia	1.9	13.7
Dry mouth	2.8	13.5
Constipation	6.1	15.1
Dysgeusia	1.1	7.4
Insomnia	4.7	5.8
Dizziness	3.4	7.2
Nausea	4.4	3.6

Phen/Top, phentermine/topiramate;
Qsymia [package insert]. Mountain View, CA : Vivus; 2012.

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Naltrexone ER/Bupropion ER

- Brand name: Contrave
- Indication: Obesity
- Mechanism of action:
  - POMC receptors in hypothalamus which is believed to regulate appetite
  - Mesolimbic dopamine circuit which is believed to control reward pathways associated with eating

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Naltrexone ER/Bupropion ER

- Dose: 8 mg / 90 mg
- Titration:
  - 1 pill in am x 1 week, 1 pill bid x 1 week, 2 pills in am and 1 in pm x 1 week, 2 pills bid
  - Take in the morning and evening
  - Do not crush or chew

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Naltrexone ER/Bupropion ER

- Efficacy:
  - 43% vs. 17% lost 5% or more of body weight
  - 21% vs. 7% lost 10% or more of body weight
  - 0.6% decrease in A1C vs. 0.1% decrease in placebo group (individuals with Type 2 diabetes)
- Side effects:
  - Nausea: 32.5% vs. 6.7%
  - Constipation: 19.2% vs. 7.2%
  - Headache: 17.6% vs. 10.4%

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Naltrexone ER/Bupropion ER

- Recommendations:
  - Starter slower than titration dose recommends
  - Take more than 1 month to get to maximum dosage
- Contraindications:
  - Seizure disorders, anorexia or bulimia
  - Uncontrolled hypertension
  - Chronic opioids
  - MAOIs
  - Pregnancy

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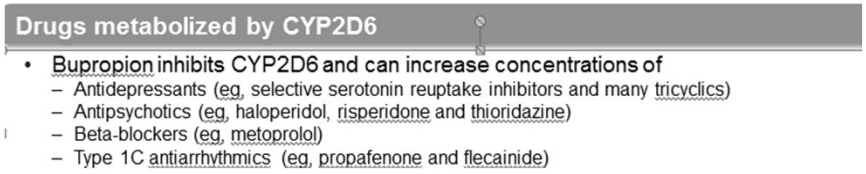
Naltrexone ER/Bupropion ER

- Drug/drug interactions
  - Opioids: blocks mu receptor sites
  - Other drugs metabolized by CYP2D6



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Naltrexone ER/Bupropion ER

- Warnings
  - Monitor BP – systolic BP rose 1-2 mm in clinical trials
  - Monitor for suicidal ideations
  - Can cause false positive drug test for amphetamines
- Advantage
  - Not scheduled (no DEA required)
- Cost:
  - $70.00 x 2 months then $60.00 thereafter

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Liraglutide

- Brand name: Saxenda
- Dosage: 3 mg daily
- Indication: obesity
  - BMI: 30 or higher or 27 with obesity related co-morbidity
- Mechanism of action: GLP-1R agonist
- Side effects: nausea

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Liraglutide

- Efficacy
  - 62% of patients treated with liraglutide lost at least 5 percent of their body weight vs. 34% percent of patients treated with placebo.
  - Individuals with Type 2 diabetes had an average weight loss of 3.7% from baseline vs. placebo.
  - 49% of patients treated lost at least 5 percent of their body weight compared with 16 % of patients treated with placebo.

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Liraglutide

- Evaluate patient at week 16
  - If patient has not lost 4% or more of body weight, can consider d/c of drug
- Carries all same warnings as liraglutide (Victoza)
  - Medullary thyroid carcinoma
  - Pancreatitis
- Associated with a REMS program
  - As was / is case with liraglutide (Victoza)

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Semaglutide

- Semaglutide (Wegovy)
- Class: GLP-1 agonist; injectable
- Indication: BMI 30 or greater or 27.0 or higher with comorbidity
- Dose: 0.25 mg once weekly x 4 weeks; then 0.50 mg once weekly x 4 weeks; 1.0 mg once weekly x 4 weeks; 1.7 mg once weekly x 4 weeks; then a maximum of 2.4 mg once weekly

https://www.novo-pi.com/wegovy.pdf accessed 08-25-2021

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Semaglutide

- Carries same warnings and precautions as GLP-1 agonists
- Okay in individuals with CKD
- Efficacy:
  - 3 double-blinded placebo-controlled trials; 2116 patients; Up to 68 weeks
  - Percent of patients losing ≥ 5% of body weight (31.1 vs. 83.5; 30.2 vs. 67.4; 47.8 vs. 84.8)
  - Percent of patients losing ≥ 10 % of body weight (12.0 vs. 66.1; 10.2 vs. 44.5; 27.1 vs. 73.0)

https://www.novo-pi.com/wegovy.pdf

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Semaglutide

- Side effects:
  - Nausea (44% vs. 16%)
  - Diarrhea (30% vs. 16%)
  - Vomiting (24% vs. 6%)
  - Constipation (24% vs. 11%)

https://www.novo-pi.com/wegovy.pdf accessed 08-25-2021

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What Else Can You Offer Individuals?

- Consider:
  - Metformin (Glucophage)
  - Liraglutide (Victoza)
  - Semaglutide (Ozempic); semaglutide (Rybelsus)
  - Topiramate (Topamax)

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Non-systemic hydrogel (Plenity)

- Biodegradable oral non-systemic hydrogel which promotes fullness and may help to increase satiety to help with weight management
- The capsules disintegrate in the stomach and release the enclosed hydrogel particles, which can then hydrate up to 100 times their original weight
- When fully hydrated, the individual non-clustering hydrogel particles occupy about a quarter of average stomach volume
- The gel particles mix with ingested foods, creating a larger volume with higher elasticity and viscosity in the stomach and small intestine, promoting satiety and fullness •
- The hydrogel particles are partially degraded enzymatically in the colon, releasing most of the absorbed water, and subsequently being excreted in the feces •
- Regulated by the FDA as a class II medical device because it acts through mechanical modes of action

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VBLOC Device

- Works by blocking vagus nerve that transmits feelings of hunger from the gut to the brain
- Implanted similarly to a pacemaker
- Controlled wirelessly and charged in the same manner
- Efficacy:
  - 24.4% excess weight loss
  - 52% lost at least 20% of excess weight (8.5% more than placebo)

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Gastric Balloon

- Relatively new procedure
- Orbera procedure
  - Silicone balloon is inserted endoscopically into stomach under conscious sedation
  - Balloon filled with saline to varying degrees to fit stomach
  - Entire procedure takes approximately 20 – 30 minutes
  - Stays in stomach for 6 months

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Case Study

- BMI: 34.2
- BP: 118/84
- P: 90
- Heent: unremarkable
- Lungs: clear
- Heart: S1S2; RRR
- PV: unremarkable

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What Medication Would You Consider?

- What options do you have with her?
  - Orlistat
  - Phentermine
  - Phentermine/topiramate
  - Naltrexone ER/Bupropion ER
  - Liraglutide
  - Semaglutide

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Dietary Supplements for Weight Loss – a Systematic Review[1]

- Five systematic reviews and meta-analyses, + 25 trials reviewed on the following:
  - Chitosan, chromium picolinate, Ephedra sinica, Garcinia cambogia, glucomannan, guar gum, hydroxy-methylbutyrate, plantago psyllium, pyruvate, yerba maté, yohimbine
- RESULTS: evidence for reducing body weight is not convincing; none of the supplements reviewed can be recommended for OTC use

1. Pittler MH and Ernst E. Am J Clin Nutr 2004;79:529-36.

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Thank You For Your Time and Attention!!

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Contact information:

Wendy L. Wright, APRN
Amherst, NH

WendyARNP@aol.com

Wright, 2022

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