



43rd Annual Meeting
Quality Through Best Practices

California Association of Long Term Care Medicine
Promoting quality patient care through medical leadership and education

Managing Metabolic Syndrome and Obesity

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Speaker Disclosure Statement 

Dr. Tim Gieseke has no relevant financial relationships with commercial interests to disclose.

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Objectives



- Classification of obesity & potential complications
- Metabolic syndrome role in obesity complications.
- Management options:
 - Assessment tools
 - Interventions for health improvement.
 - Partnering with community and web based resources

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Culture Change: Obesity



- The new “Normal”
- Average Weight gain ~ 30# over last 40 years
- Plate & portion sizes have increased
- Disproportionately affects women
- Closely linked with 7 of the top leading causes of death
- Mortality similar to life time cigarette smoking
- Parents may outlive children
- All of our tissues become “Fatter”
- Toxic “Metabolic Changes” are common

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“Toxic” Metabolic Abnormalities

- > Insulin resistance
- > Adipocyte cytokines
- > Atherogenic Lipid changes
- > **White Adipocytes** expansion of gut mesentery and gut obesity, rather than healthy more metabolically active **Brown adipocytes**.
- > BP (multiple mechanisms)
- > Sympathetic nervous system activity.
- > Endothelial dysfunction (reduced vaso-dilation)
- > Pro-inflammatory (> CRP)
- > Pro-thrombotic state

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Co-morbid Complications

- Type 2 DM
- CAD, HBP, HFpEF (Diastolic CHF), A. Fib
- Obstructive Sleep Apnea, Pulmonary HTN
- CKD, Kidney stones, Incontinence
- Stroke & Dementia
- Pulmonary Embolus & DVT
- Fatty liver, Steatosis, & Cirrhosis
- DJD (Back, Hips, Knees), Deconditioning, Falls, Fractures, & Frailty

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Co-Morbid Complications



- Cancers:
 - Esophageal (Barret's Esophagus), Breast, Ovary, Cervical, Colon, Liver, Bile, Kidney, Thyroid, & Leukemia
- Mental illnesses:
 - Depression, Anxiety Disorders, PTSD, Adjust D.O's
- Infections
 - Influenza, Post-op skin & soft tissue
- Health Stigma:
 - Education, Employment, Health Care
- > Health Care costs, # Sick days, & 3x > Disabled pensioner.

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Obesity & Reduced Hospice Use (AIM Feb 7, 2017)

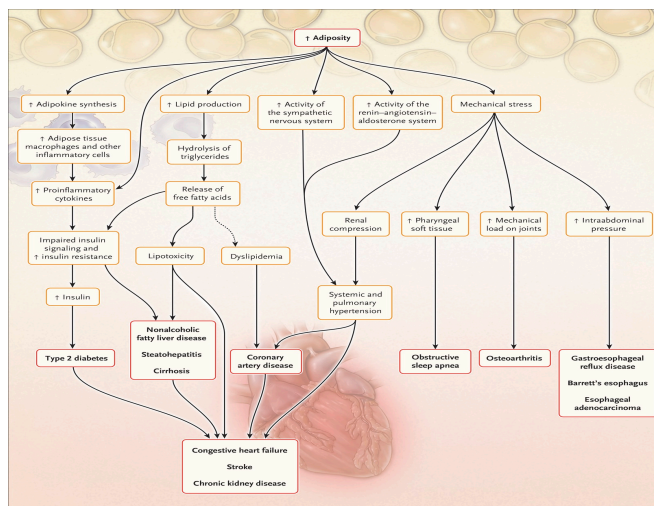


- Retrospective cohort of 5,677 community dwelling Medicare fee for service beneficiaries who died 1998-2012.
- The greater the BMI
 - < likely to enroll in hospice
 - < duration on hospice
 - < likely to have in-home death
- If morbidly obese, 15% < enrollment, 4.3 days < duration, & 6.3% < in-home death
- Potential Reasons:
 - Dying trajectory less obvious
 - More difficult to open cases and sustain care at home

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Some Pathways through Which Excess Adiposity Leads to Major Risk Factors and Common Chronic Diseases.



NEW ENGLAND JOURNAL OF MEDICINE

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Reasons for Obesity Epidemic



- > Fast food access
- > Soft drinks
- < Physical activity in our occupations
- > Leisure time filled w/ sedentary activities
 - TV, computers, smart phones, spectators, etc.
- > Food Portions at meals / Snacks / Deserts
- > Medications associated with weight gain
- < Sleep

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NCEP ATP3 Definition of Met. Syn. (#Abnormalities: 3-5 for dx)



- Glucose >100 or Drug Rx for **Pre-DM or D.M.**
- Low HDL Cholesterol
 - < 40 mg/dl in Men
 - < 50 mg/dl in Women
- High Triglycerides > 150 mg/dl or Drug Rx
- Abdominal obesity (Waist circumference)
 - > 102 cm (40 inches) for men*
 - >88 cm (35 inches) for women*
- HBP > 130/85 or Drug Rx for HBP
- * Asian patients: > 90 cm men, > 80 cm women.
European men > 94 cm (37 inches).

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Ethnic specific values for waist circumference

Ethnic group	Waist circumference (as measure of central obesity)
Europeids*	
Men	≥94 cm
Women	≥80 cm
South Asians	
Men	≥90 cm
Women	≥80 cm
Chinese	
Men	≥90 cm
Women	≥80 cm
Japanese	
Men	≥90 cm
Women	≥80 cm
Ethnic South and Central Americans	Use South Asian recommendations until more specific data are available
Sub-Saharan Africans	Use European data until more specific data are available
Eastern Mediterranean and middle east (Arab) populations	Use European data until more specific data are available

Data are pragmatic cutoffs and better data are required to link them to risk. Ethnicity should be basis for classification, not country of residence.

* In USA, Adult Treatment Panel III values (102 cm male, 88 cm female) are likely to continue to be used for clinical purposes. In future epidemiological studies of populations of Europid origin (white people of European origin, regardless of where they live in the world), prevalence should be given, with both European and North American cutoffs to allow better comparisons.

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4 other International Definitions

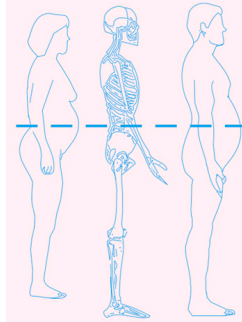
- Differ by requirements for:
 - Insulin resistance or fasting hyperinsulinemia in top 25% quartile
 - Presence of co-morbidities commonly associated with insulin resistance & obesity
 - BMI > 30
 - > Waist hip ratio
 - 0.9 for Men
 - 0.85 for Women

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Waist circumference measurement



Measuring-tape position for waist (abdominal) circumference in adults. To measure waist circumference, locate the upper hip bone and the top of the right iliac crest. Place a measuring tape in a horizontal plane around the abdomen at the level of the iliac crest. Before reading the tape measure, ensure that the tape is snug, but does not compress the skin, and is parallel to the floor. The measurement is made at the end of a normal expiration.

Reproduced from: National Heart, Lung, and Blood Institute. The Practical Guide: Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Heart Lung and Blood Institute, Bethesda, MD, October 2000.

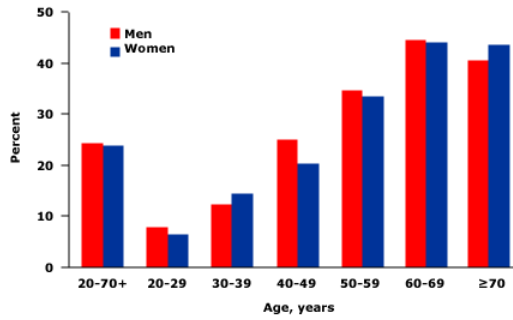
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Prevalence of NCEP ATP III metabolic syndrome among subjects in the NHANES III survey, by age



Adapted from: Ford ES, Giles WH, Dietz WH. Prevalence of the metabolic syndrome among US adults: findings from the third National Health and Nutrition Examination Survey. JAMA 2002; 287:356.

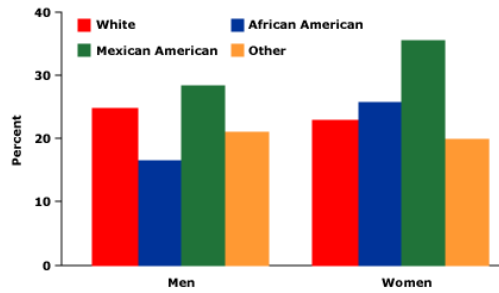
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Prevalence of NCEP ATP III metabolic syndrome among subjects in the NHANES III survey by race/ethnicity and sex



Adapted from: Ford ES, Giles WH, Dietz WH. Prevalence of the metabolic syndrome among US adults: findings from the third National Health and Nutrition Examination Survey. JAMA 2002; 287:356.

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Classification of overweight and obesity by BMI, waist circumference, and associated disease risk

	BMI kg/m ²	Obesity class	Disease risk* relative to normal weight and waist circumference	
			Men ≤102 cm (≤40 in)	>102 cm (>40 in)
			Women ≤88 cm (≤35 in)	>88 cm (>35 in)
Underweight	<18.5		-	-
Normal†	18.5 to 24.9		-	-
Overweight	25.0 to 29.9		Increased	High
Obesity	30.0 to 34.9	I	High	Very high
	35.0 to 39.9	II	Very high	Very high
Extreme obesity	≥40	III	Extremely high	Extremely high

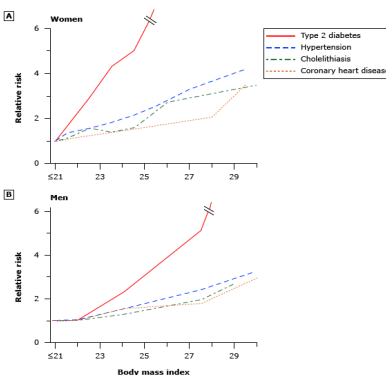
BMI: body mass index.
 * Disease risk for type 2 diabetes, hypertension, and cardiovascular disease (CVD).
 † Increased waist circumference can also be a marker for increased risk even in persons of normal weight.

Reproduced from: Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults—The Evidence Report. National Institutes of Health. Obes Res 1998; 6:515.

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Body mass index and the risk of disease



Increasing body mass index (BMI, kg/m²), even within the normal range of BMI (21 to 24.9), is associated with an increased risk of type 2 diabetes, hypertension, coronary heart disease, and cholelithiasis. Panel A shows data for women in the Nurses' Health Study, initially 30 to 55 years of age, who were followed for up to 18 years. Panel B shows data for men in the Health Professionals Follow-up Study, initially 40 to 65 years of age, who were followed for up to 10 years.

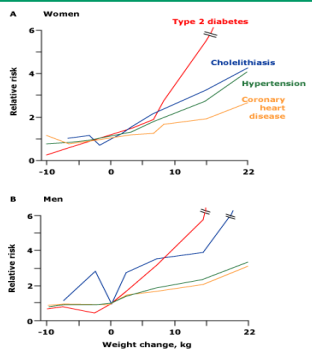
Data from: Willett WC, Dietz WH, Colditz GA. Guidelines for healthy weight. *N Engl J Med* 1999; 341:427.

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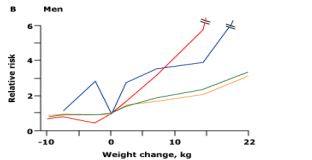


Adult weight change and the risk of disease

A Women




B Men




Even a modest increase in weight as an adult is associated with an increased risk of type 2 diabetes, hypertension, coronary heart disease, and cholelithiasis. Panel A shows data for women in the Nurses' Health Study, initially 30 to 55 years of age, who were followed for up to 18 years. Panel B shows data for men in the Health Professionals Follow-up Study, initially 40 to 65 years of age, who were followed for up to 10 years.

Data from: Willett WC, Dietz WH, Colditz GA. Guidelines for healthy weight. *N Engl J Med* 1999; 341:427.




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Clinical and laboratory data for the evaluation of overweight patients

Height, in or cm	
Weight, lb or kg	
Calculated BMI, kg/m ²	
Waist circumference, in or cm	
Blood pressure SBP/DBP, mmHg	
Fasting serum triglyceride, mg/dL or mmol/L	
Serum HDL cholesterol, mg/dL or mmol/L	
Fasting blood glucose, mg/dL (or glycated hemoglobin [A1C], %)	
Are there symptoms of sleep apnea?	
Are there medication(s) that increase body weight?	
Is there regular physical activity?	
Are there other etiologic factors?	

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; HDL: high-density lipoprotein.



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Medications associated with weight gain

Glucocorticoids (prednisone)
Diabetes medications (insulin, sulfonylureas, thiazolidindiones, meglitinides)
First-generation antipsychotics (thioridazine)
Second-generation antipsychotics (risperidone, olanzapine, clozapine, quetiapine)
Neurologic and mood stabilizing agents (carbamazepine, gabapentin, lithium, valproate)
Antihistamines (especially cyproheptadine)
Antidepressants (paroxetine, citalopram, amitriptyline, nortriptyline, imipramine, mirtazapine)
Hormonal agents (especially progestins, eg, medroxyprogesterone)
Beta-blockers (especially propranolol)
Alpha-blockers (especially terazosin)

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Categorization of anti-depressants, anti-convulsants, and anti-psychotic drugs by their effects on body weight

Produce weight loss
Bupropion
Venlafaxine
Desvenlafaxine
Topiramate
Zonisamide
Lamotrigine
Ziprasidone
Are weight neutral
Haloperidol
Aripiprazole
Produce weight gain
Tricyclic antidepressants*
Monoamine oxidase inhibitors
Paroxetine
Escitalopram
Lithium
Olanzapine
Clozapine
Risperidone
Carbamazepine
Valproate
Divalproex
Mirtazapine

* Nortriptyline, amitriptyline, doxepin.

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Basic Therapeutic Interventions

- Portion control is key issue (plate size).
- Emphasize foods less calorically dense that quench hunger
 - Vegetables, Salads, Fruits (Apple slices), Mixed non-salted nuts.
 - Diets: Mediterranean, DASH, “Healthy Diet for All”
 - Commercial Programs: Wt Watchers & Jenny Craig
- Graded exercise program complements diet efforts, but alone are ineffective
- Behavioral therapy & counseling
- Treatment of co-morbidities per guidelines
- Cigarette Cessation (2x > risk mortality if obese)
- Drug Therapy
- Bariatric surgery

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Basic Therapeutic Interventions


Table 1. Recommended Components of a High-Intensity Comprehensive Lifestyle Intervention to Achieve and Maintain a 5-to-10% Reduction in Body Weight.*

Component	Weight Loss	Weight-Loss Maintenance
Counseling	≥14 in-person counseling sessions (individual or group) with a trained interventionist during a 6-mo period; recommendations for similarly structured, comprehensive Web-based interventions, as well as evidence-based commercial programs	Monthly or more frequent in-person or telephone sessions for ≥1 yr with a trained interventionist
Diet	Low-calorie diet (typically 1200–1500 kcal per day for women and 1500–1800 kcal per day for men), with macronutrient composition based on patient’s preferences and health status	Reduced-calorie diet, consistent with reduced body weight, with macronutrient composition based on patient’s preferences and health status
Physical activity	≥150 min per week of aerobic activity (e.g., brisk walking)	200–300 min per week of aerobic activity (e.g., brisk walking)
Behavioral therapy	Daily monitoring of food intake and physical activity, facilitated by paper diaries or smart-phone applications; weekly monitoring of weight; structured curriculum of behavioral change (e.g., DPP), including goal setting, problem solving, and stimulus control; regular feedback and support from a trained interventionist	Occasional or frequent monitoring of food intake and physical activity, as needed; weekly-to-daily monitoring of weight; curriculum of behavioral change, including problem solving, cognitive restructuring, and relapse prevention; regular feedback from a trained interventionist

* Data are from the Guidelines (2013) for the Management of Overweight and Obesity in Adults, reported by Jensen et al.³⁹ The guidelines concluded that a variety of dietary approaches that differ widely in macronutrient composition, including ad libitum approaches (in which a lower calorie intake is achieved by restriction or elimination of particular food groups or by the provision of prescribed foods), can lead to weight loss provided they induce an adequate energy deficit. The guidelines recommended that practitioners, in selecting a weight-loss diet, consider its potential contribution to the management of obesity-related coexisting disorders (e.g., type 2 diabetes and hypertension). The guidelines did not address the possible benefits of strength training, in addition to aerobic activity. DPP denotes Diabetes Prevention Program.

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A systematic approach to management based on BMI and other risk factors


Assess overall health risk from BMI and other risk factors, eg waist circumference

BMI	Overall Health Risk	Management Strategies
	Additional risk factors? No Yes	
18.5-24.9	Average	Healthy diet and advice on preventing weight gain. Elevated waist circumference: institute weight management. Family history of obesity: prevent weight gain.
	Increased	>3 kg Smoking: stop, provide dietary advice. Lipids high: dietary advice Hypertensive: diet, exercise, weight maintenance. Glucose intolerance: exercise, diet, weight maintenance.
25-29.9	Increased	Weight maintenance, healthy diet, exercise.
	Moderate	Goal for diet, exercise, behavior: primarily geared to risk management. Weight loss needed if risk not reduced substantially within 3 months, then aim for 5-10 kg over 24 weeks by mild energy deficit. If not achieving this weight reduction at 24 weeks and risks persist, test usefulness of drug to reduce risk by weight management.
30-34.9	Moderate	Goal of 5-10 percent weight loss without risk appropriate.
	Severe	Consider very low calorie diet and drug therapy if diet, exercise and lifestyle program unsuccessful after 12 weeks in reducing all risk factors.
35-39.9	Severe	Use fat therapy excluding drugs to achieve >10 percent weight loss.
	Very severe	Refer to specialists for separate management and consideration of surgery if conventional treatment fails. Aim for 20-30 percent weight reduction.
>40	Very severe	

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Medications Approved by the Food and Drug Administration for Long-Term Weight Management.

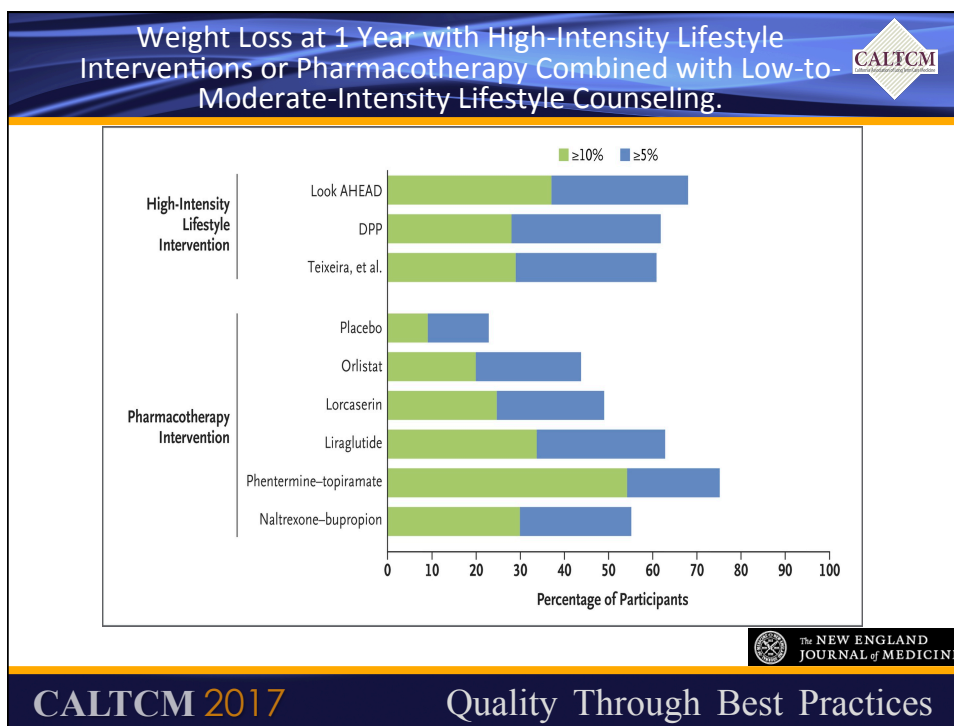
Table 2. Medications Approved by the Food and Drug Administration for Long-Term Weight Management.*

Drug	Main Mechanisms of Action	Dose	Study Duration wk	Mean Weight Loss† kg (%)	Common Side Effects	Contraindications
Orlistat ¹	Pancreatic and gastric lipase inhibitor; resulting fat malabsorption reduces net energy intake	120 mg before meals (three times a day)	52	Drug, 8.8 (8.8); placebo, 5.8 (5.8); PSWL, 2.6	Oily spotting, flatus with discharge, fecal urgency, oily evacuation, increased defecation, fecal incontinence	Pregnancy, chronic malabsorption syndrome, cholestasis
Lorcaserin ²	Selective 5HT _{2C} receptor agonist; promotes satiety to reduce food intake	10 mg twice a day	52	Drug, 5.8 (5.8); placebo, 2.2 (2.2); PSWL, 3.2	In patients without diabetes: headache, dizziness, fatigue, nausea, dry mouth, constipation; in patients with diabetes: hypoglycemia, headache, back pain, fatigue	Pregnancy
Liraglutide ³	GLP-1 agonist; delays gastric emptying to reduce food intake	Starting dose, 0.6 mg given subcutaneously; dose increased weekly by 0.6 mg as tolerated to reach 3.0 mg	56	Drug, 8.4 (8.0); placebo, 2.8 (2.6); PSWL, 5.3	Nausea, vomiting, constipation, hypoglycemia, diarrhea, headache, fatigue, dizziness, abdominal pain, increased lipase levels	Pregnancy, personal or family history of medullary thyroid cancer or multiple endocrine neoplasia type 2
Phentermine-topiramate ⁴	Norepinephrine-releasing agent (phentermine), GABA receptor modulation (topiramate); decreases appetite to reduce food intake	Starting dose, 3.75 mg/23 mg for 2 wk; recommended dose, 7.5 mg/46 mg; maximum dose, 15 mg/92 mg	56	Drug, 8.1 (7.8) at recommended dose, 10.2 (9.8) at maximum dose; placebo, 1.4 (1.2); PSWL, 8.8	Insomnia, dry mouth, constipation, paresthesias, dizziness, dysgeusia	Pregnancy, hyperthyroidism, glaucoma, MAOIs, hypersensitivity to sympathomimetic amines
Naltrexone-bupropion ⁵	Opioid antagonist (naltrexone), dopamine and norepinephrine reuptake inhibitor (bupropion); acts on CNS pathways to reduce food intake	1 tablet (8 mg of naltrexone and 90 mg of bupropion) daily for 1 wk; dose subsequently increased each wk by 1 tablet per day until maintenance dose of 2 tablets twice a day at wk 4	56	Drug, 6.2 (6.4); placebo, 1.3 (1.2); PSWL, 5.0	Nausea, constipation, headache, vomiting, dizziness, insomnia, dry mouth, diarrhea	Uncontrolled hypertension, seizure disorders, anorexia nervosa or bulimia, drug or alcohol withdrawal, use of MAOIs, long-term opioid use, pregnancy

* For each medication, weight-loss data are from a pivotal phase 3 trial submitted to the FDA for drug approval.^{6,8,10,11,12} CNS denotes central nervous system, GABA gamma-aminobutyric acid, GLP-1 glucagon-like peptide 1, 5HT_{2C} 5-hydroxytryptamine 2C, and MAOI monoamine oxidase inhibitors.
† Data on placebo-subtracted weight loss (PSWL) are from a meta-analysis of studies.¹³

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Surgical Interventions for Obesity

- Laparoscopic Adjustable Gastric Banding (LAGB)
 - Least invasive, safest, & reversible
 - High re-op rate and reduced long term efficacy so seldom done now (< 6 % of obesity procedures in 2013)
- Roux-en-Y
 - Creates upper gastric pouch connected to Jejunum with 95% of food bypassing stomach and duodenum
 - ~ 25 % wt. loss at 1 year
- Vertical-sleeve Gastrectomy
 - Removes 70% of stomach w/acceleration of gastric emptying
 - ~ 30% wt. loss at 1 year

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Benefits & Risks of Surgery

- > Remission rates for **Diabetes** at 3 years
 - 5% for intensive medical therapy (IMT)
 - 24% for IMT combined with vertical-sleeve gastrectomy
 - 38% for IMT combined with Roux-en-Y gastric bypass
- **Mortality:** 0.1, 0.2, & 0.3% for Lap Band, Vertical-sleeve, and Roux-en-Y
- Serious Periop **ADEs:** 1, 5, & 5% respectively
- Long term efficacy likely for: Vertical-Sleeve and Roux-en-Y.
- NEJM Feb 2017, @ 5 years, gastric bypass vs. IMT for DM w/BMI (27-43) had much > improvement in DM, lipid, Wt., and QOL measures.

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Team Approach (KJ Page, T Clark Presentation & Case Studies)

- Engage your Team:
 - Physicians, Nurses, CNAs
 - Admissions Coordinator
 - Dietary
 - Facilities engineer
 - MDS Coordinator – Effective Care Conferences
 - Clinical Psychologist
 - Activities / Community Developer
 - Rehabilitation Team
- Partner with centers of expertise
 - Center for Well Being
 - Hospital Bariatric Programs
 - Community Weight Loss Programs
 - Internet Behavioral Health programs targeted for overweight persons
 - Healthy Eating Active Living Community Health Initiative in Sonoma County (**HEAL**)

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In Conclusion



- Obesity & Metabolic Syndrome are common, but wellness is possible.
- 5-10% weight loss is possible with intensive medical therapy(IMT) programs.
 - < risk for diabetes, HBP, CVDZ & other complications of obesity.
- Long term drugs are an option for high risk patients & promote > weight loss than IMT alone.
- Surgery should be consider for those who remain seriously obese
 - BMI > 40 or
 - > 35 with complications (DM, HBP, CAD)
- Treat complications per guidelines.
- Cigarette cessation (double risk of dying)
- Clinical evaluation and assessment tools for care planning
 - Identify weight promoting meds
- Provide behavioral health and counseling.
- Partner with local centers of expertise.