

Overview of Weight Loss Interventions for Obese Adults

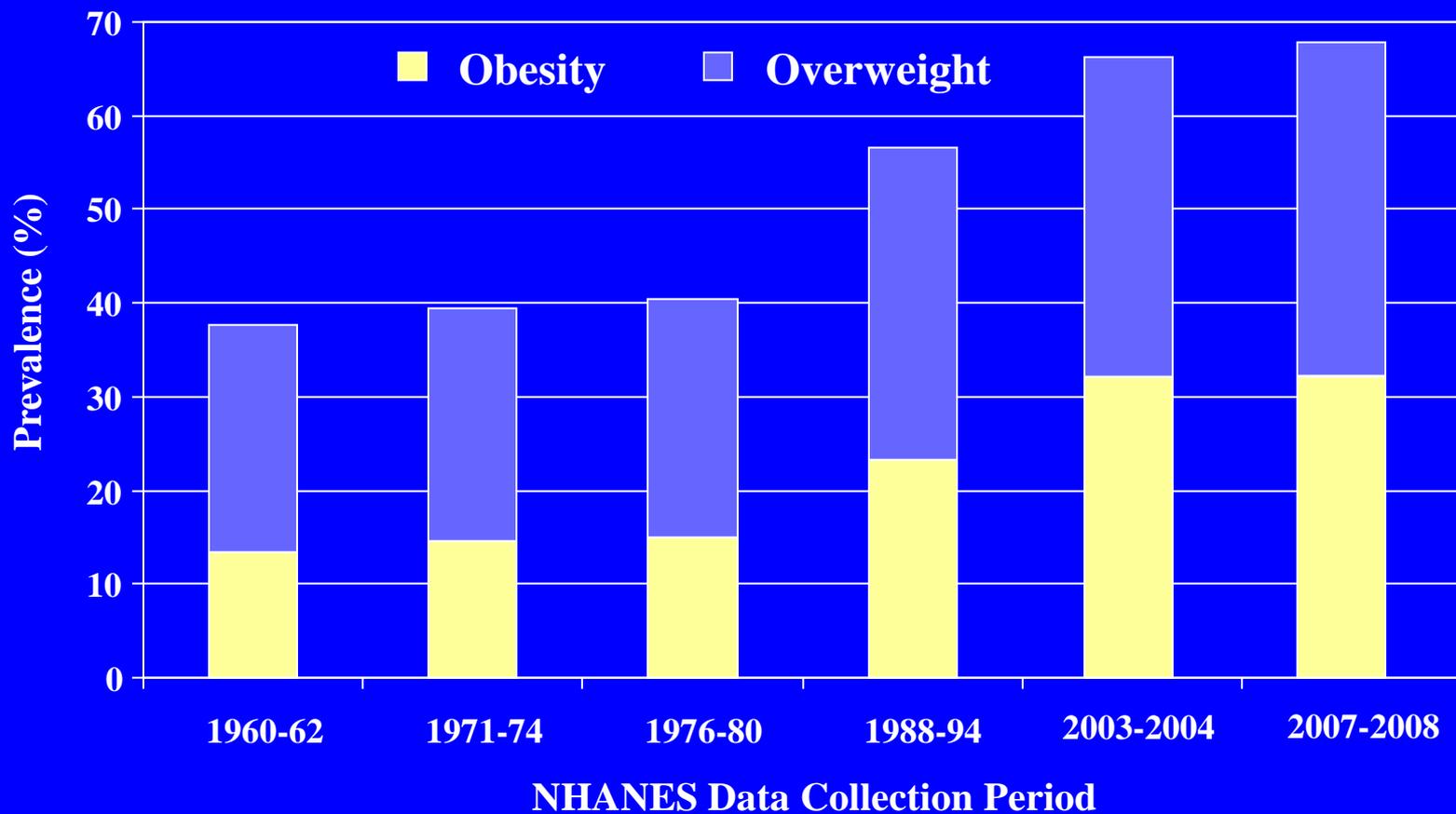
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Overview

- Benefits of Modest Weight Loss
- Lifestyle Modification
 - Diabetes Prevention Program
 - Look AHEAD
- Disseminating Lifestyle Modification
- Pharmacotherapy and Surgery
- Conclusions

Overweight and Obesity Among U.S. Adults



Flegal KM, et al. JAMA. 2002;288:1723-27
Hedley AA, et al. JAMA. 2004;291:2847-50
Ogden CL, et al. JAMA. 2006;295:1549-55
Flegal KM, et al. JAMA. 2010;303:235-41

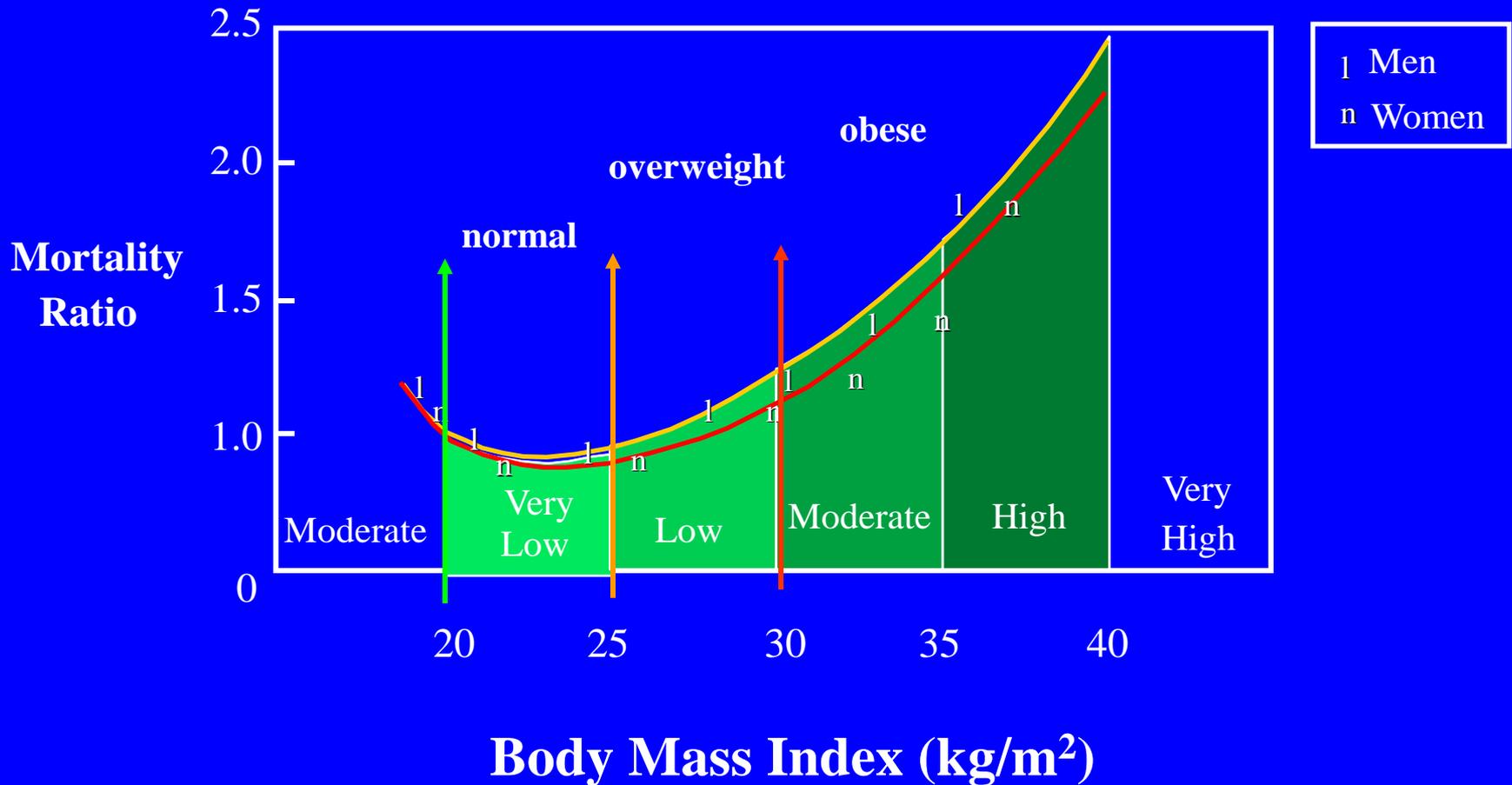
Assessing Obesity: What Is BMI?

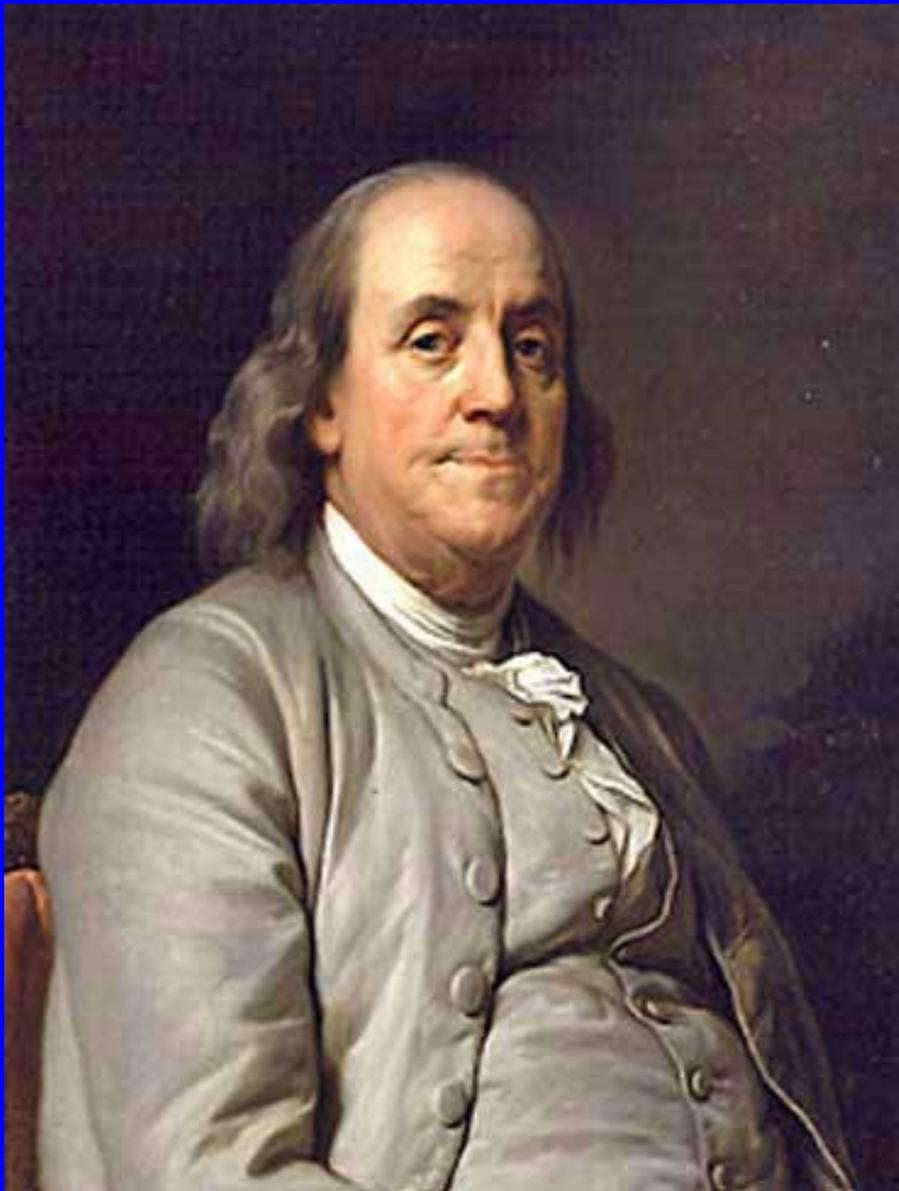
BMI Categories

- BMI
 - Calculated as $\text{weight(kg)}/\text{height(m}^2\text{)}$
 - Evaluates weight relative to height
 - Replaced % ideal body weight as the primary criterion for assessing obesity
 - Correlates significantly with body fat, morbidity, and mortality

Category	BMI
Underweight	< 18.5
Normal*	18.5–24.9
Overweight	25.0–29.9
Obesity	³ 30
Class I	30.0–34.9
II	35.0–39.9
III	³ 40

Obesity Mortality Risk





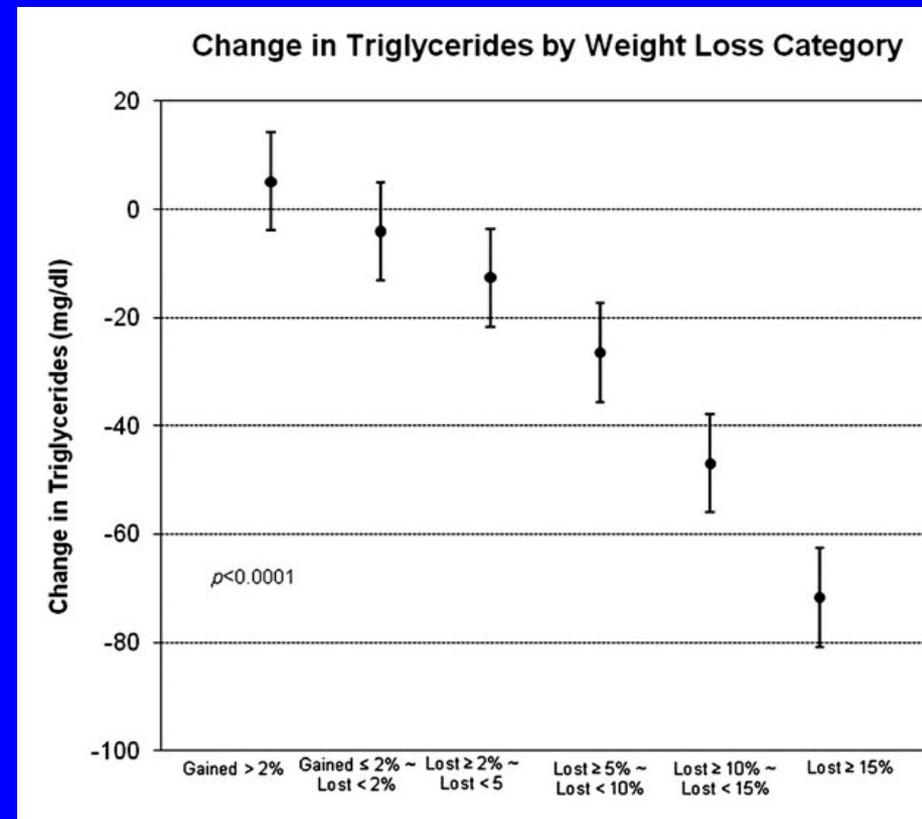
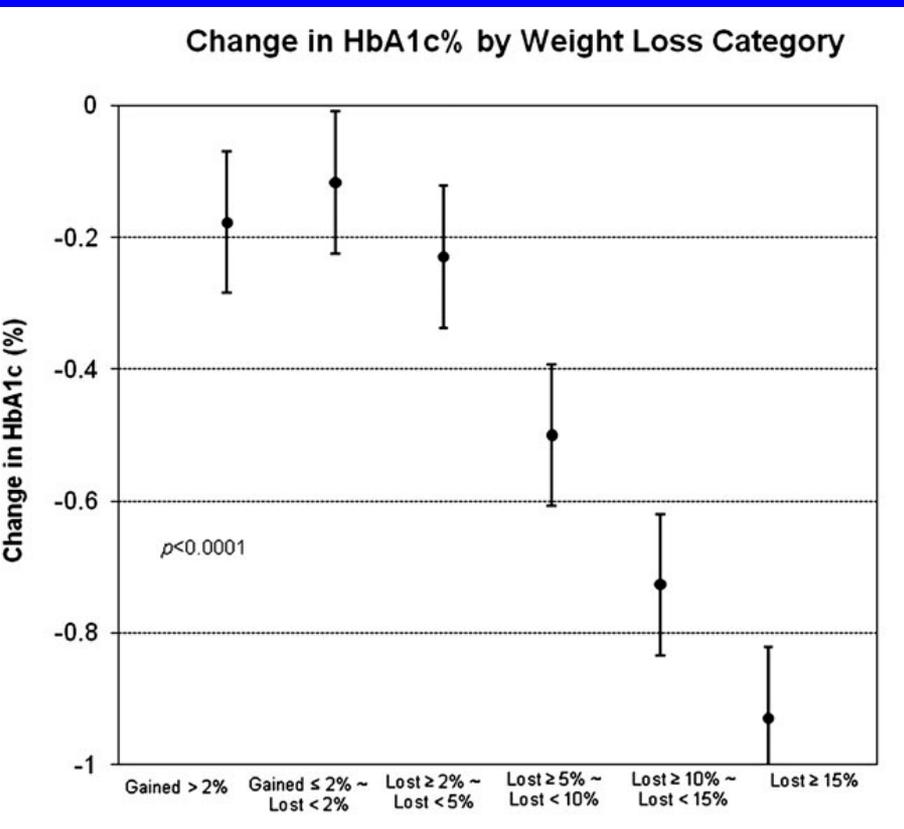
BMI = 32 kg/m²

New Goals of Weight Management: A 10% Loss of Initial Weight

“The initial goal of weight loss therapy for overweight/obese patients is a reduction in body weight of about 10%...”

“Moderate weight loss of this magnitude can significantly decrease the severity of obesity-associated risk factors.”

Benefits of a 5-10% Weight Loss: Overweight Patients with Type 2 Diabetes



A Guide to Selecting Treatment: NIH Guidelines*

Treatment	BMI Category				
	25–26.9	27–29.9	30–34.9	35–39.9	≥40
Diet, physical activity, behavior therapy	Yes with comorbidities	Yes with comorbidities	Yes	Yes	Yes
Pharmacotherapy		Yes with comorbidities	Yes	Yes	Yes
Weight loss surgery				Yes with comorbidities	Yes

* *Yes* alone indicates that the treatment is indicated regardless of the presence or absence of comorbidities. The solid arrow signifies the point at which therapy is initiated.

Lifestyle Modification for Obesity

- Consists of a set of principles and techniques to modify eating and activity habits.
- New habits can be learned in same manner as a sport or musical instrument.
- Treatment examines antecedents, behaviors and consequences (ABCs) associated with eating and activity.

Lifestyle Modification for Weight Control

- Reduce energy intake by 500-1000 kcal/day (by reducing portion size, fat, and sugar); ↑ fruits and vegetables
- Exercise \geq 150 min/week.
- Record food intake, physical activity, and weight; receive feedback.
- Set realistic goals for weight loss and behavior change.

Dietary Plan

- Consume meals and snacks at regular intervals
- Women: 1200-1500 kcal/d
Men: 1500-1800 kcal/d
- Protein: 12%-15%; Fat \leq 30%
- Variation in macronutrient content does not affect weight loss with isocaloric diets.

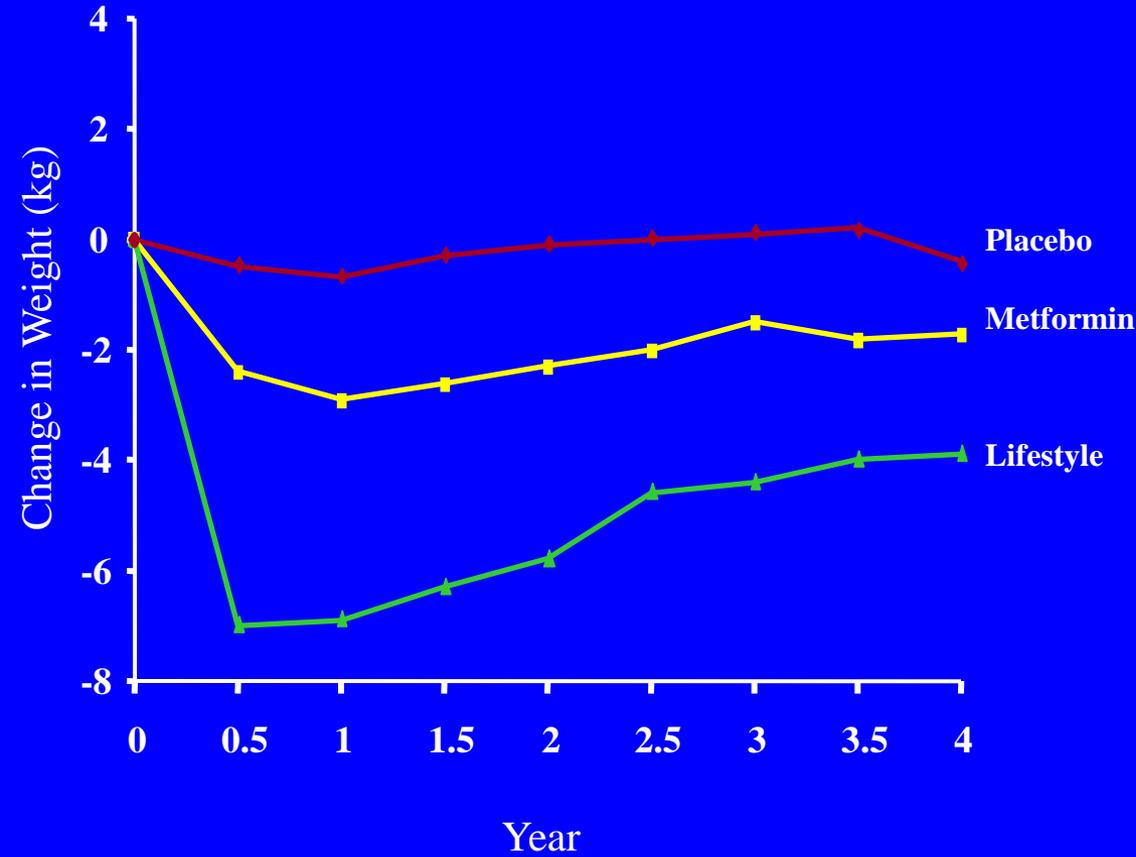
USPSTF Recommendations for Behavioral Counseling

- “The U.S. Preventive Services Task Force (USPSTF) recommends that clinicians screen all adult patients for obesity and offer intensive counseling and behavioral interventions to promote sustained weight loss for obese adults.”
 - Moderate intensity = monthly contact
 - High intensity = more frequent contact
 - Low intensity = less frequent contact.
- This is a **grade B recommendation**.

Diabetes Prevention Program

- Can a 7% reduction in initial weight, combined with increased physical activity, reduce the risk of developing type 2 diabetes in at-risk individuals?
- 3234 patients; BMI = 34.0 kg/m²; Impaired glucose tolerance (95-125 mg/dl)
- Randomly assigned to 4-year trial
 - Placebo
 - Metformin (850 BID)
 - Lifestyle intervention

DPP: Treatment Interventions and Weight Loss



COMPREHENSIVE LIFESTYLE MODIFICATION PROGRAM

Weight Loss Induction:

16 individual visits over 6 months

Diet: Low-fat diet, conventional foods (1200-1800 kcal/d)

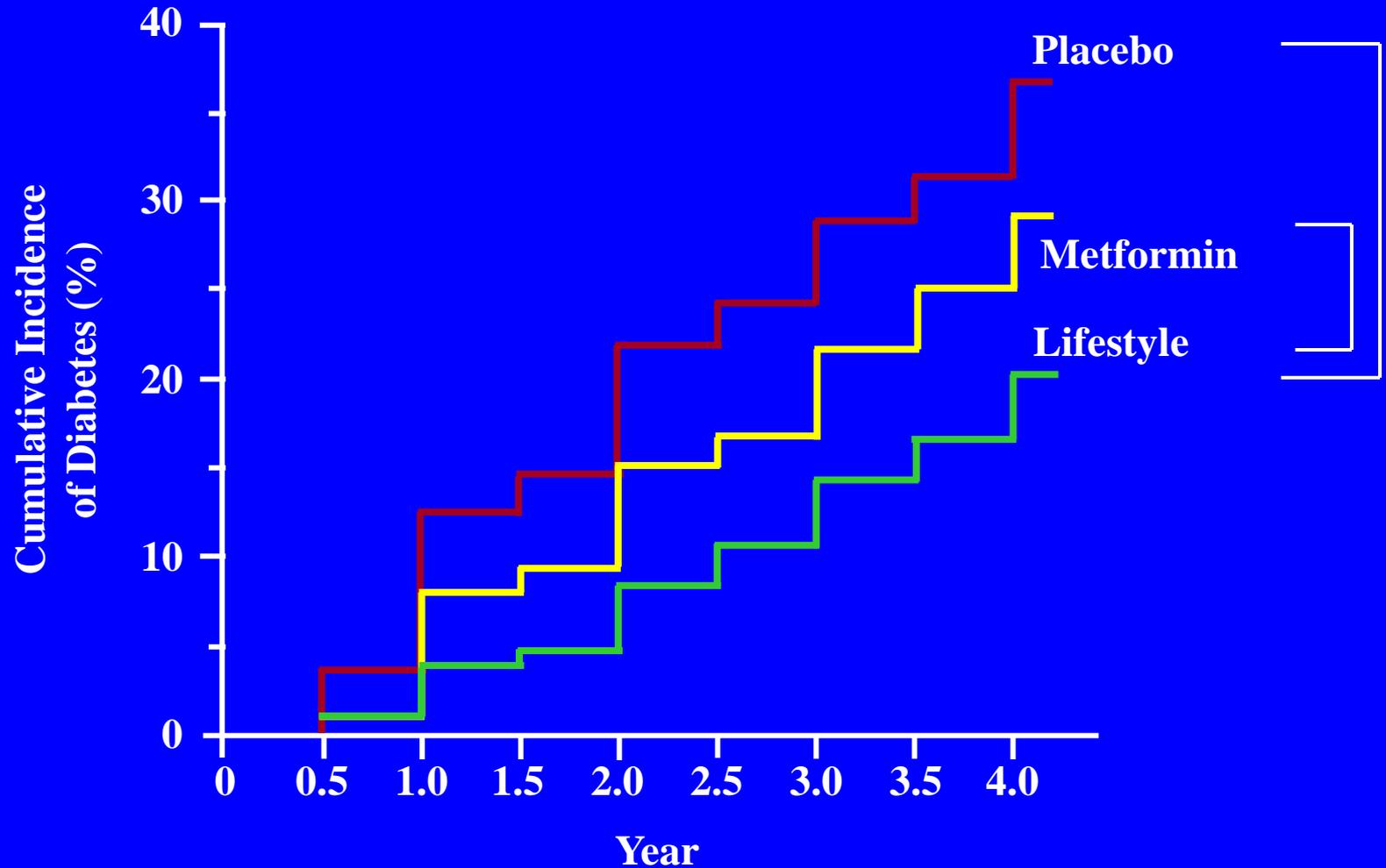
Activity: ≥ 150 minutes/week of moderate intensity exercise

Weight Maintenance: Individual visits at least every 2 months.

-Three group classes/year for 4-6 weeks (campaigns)

-Toolbox

Diabetes Prevention Program



Look AHEAD Study

Diabetes Prevention Program:

7% weight loss, with increased activity, reduced risk of developing type 2 diabetes by 58% compared w/ placebo

Look AHEAD Study:

Will a loss $\geq 7\%$ of initial weight, with increased activity, reduce risk of cardiovascular morbidity and mortality in overweight and obese persons with type 2 diabetes?

Look AHEAD Study Design

- 5145 overweight subjects with type 2 diabetes
- 2 arms
 - Usual care (Diabetes Support and Education)
 - Usual care + Intensive Lifestyle Intervention
- Study duration: up to 13.5 years (with 4 years of intensive intervention to achieve 7% loss).
- **Primary outcome: Cardiovascular death (fatal MI and stroke), nonfatal MI, and stroke; hospitalization for angina**

Treatment Factors Affecting Weight Loss in Behavioral Interventions

Induction of Weight Loss

- **Portion-controlled meals**
- Group treatment
- Longer duration
- Weight loss medication

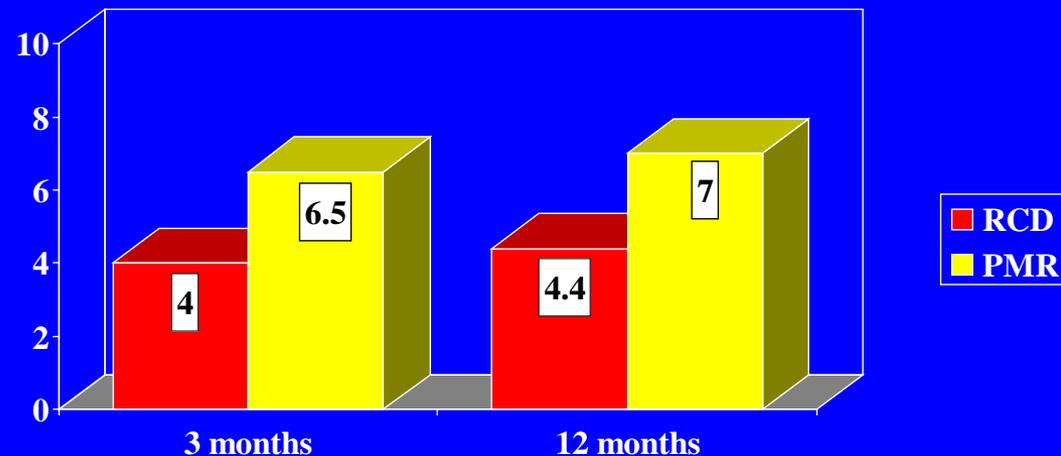
Maintenance of Weight Loss

- **Continued patient support**
- **High physical activity**

Portion-Controlled Meals

- Provide fixed-portion and calorie amounts
- Reduce choices and contact with problem foods
- Are convenient to use
- Satisfy appetite (monotony and sensory specific satiety)
- Facilitate dietary adherence

Meta-Analysis of Meal Replacements (PMR) vs. Reduced Calorie Diets (RCD)
Mean Weight Losses for Completers



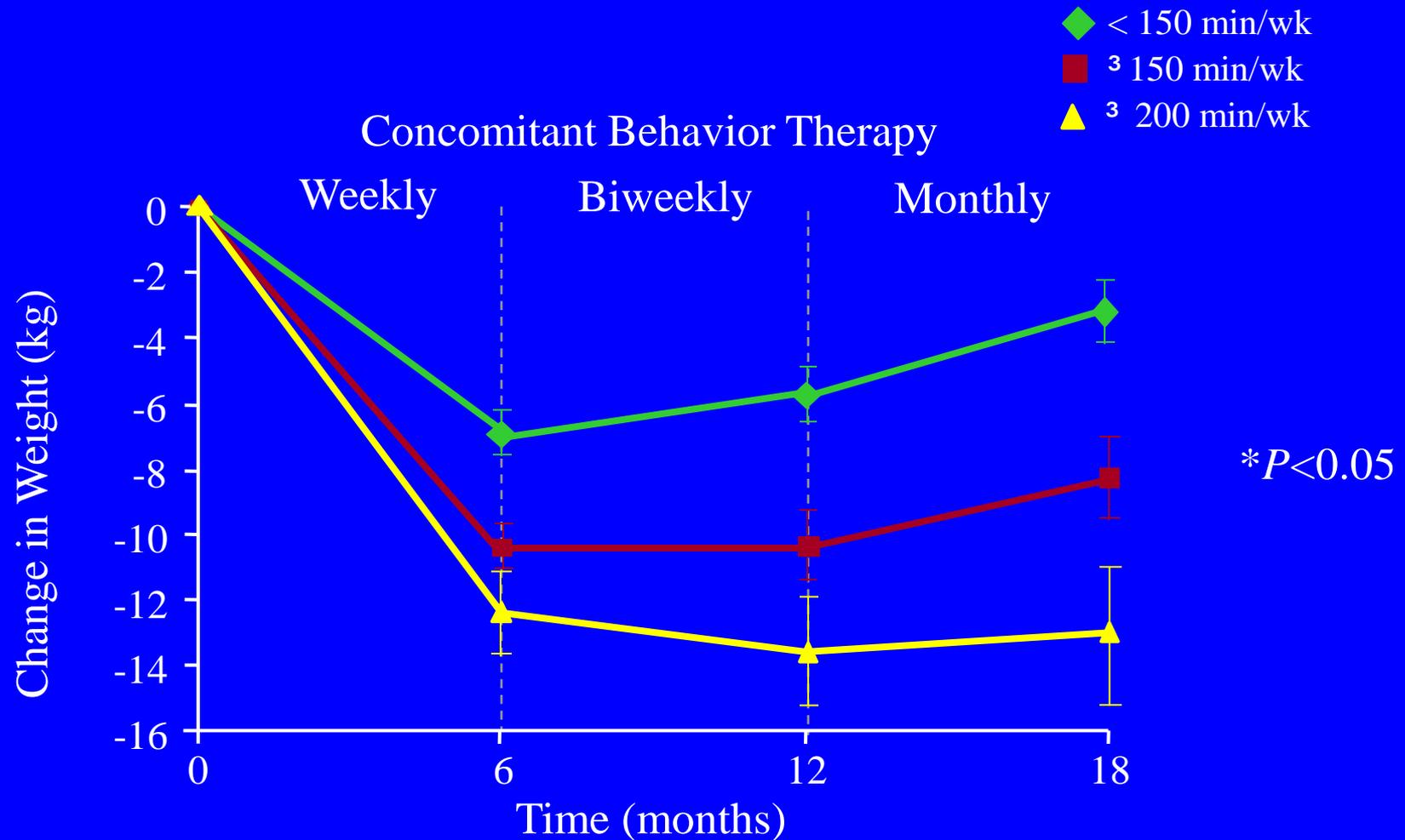
Maintenance of Weight Loss Is Improved With Long-Term Behavioral Treatment

Key Behaviors for Long-Term Weight Control

1. Monitor weight regularly
2. Exercise regularly
3. Eat low-calorie, low-fat diet
4. Record food intake periodically



High Levels of Physical Activity are Needed for Weight Loss Maintenance



LOOK AHEAD Lifestyle Intervention: Years 1-4

- Year 1
 - 2-3 group sessions/month
 - 1 individual session/month
 - Personal weight loss goal = 10%
- Years 2-4
 - Monthly onsite individual session
 - Monthly phone call or e-mail contact
 - Periodic refresher groups or campaigns offered 2-3 times per year for 6-8 weeks

Intervention Recommendations

- Dietary Intake

1200-1500 kcal/day < 250 lb

1500-1800 kcal/day \geq 250 lb

\leq 30% calories from fat

Meal replacements (2 meals and 1 snack/d
in Months 1-4; reduced use thereafter)

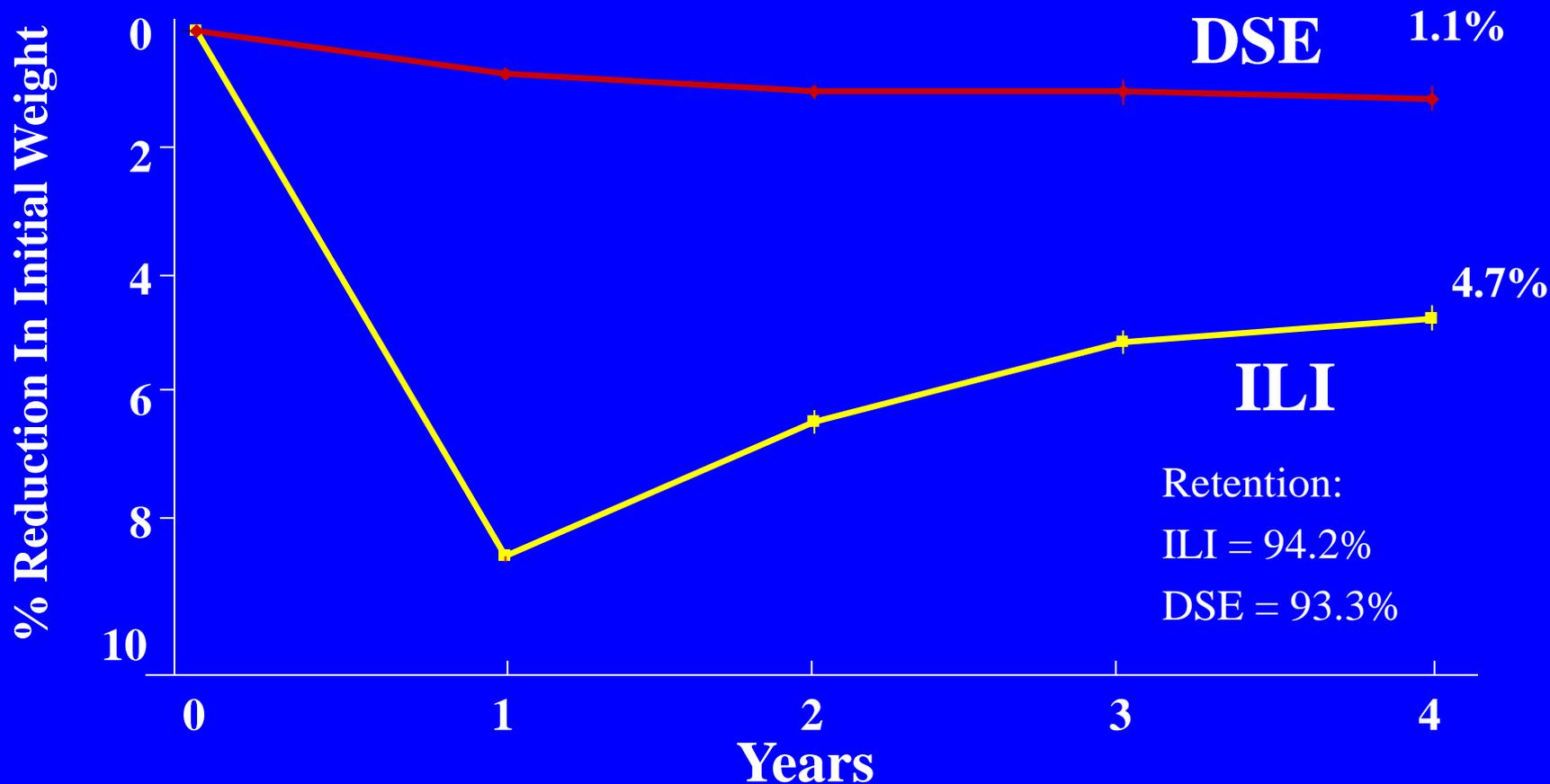
Menu plans provided

- Physical Activity

175 min/wk (achieved gradually)

10,000 steps

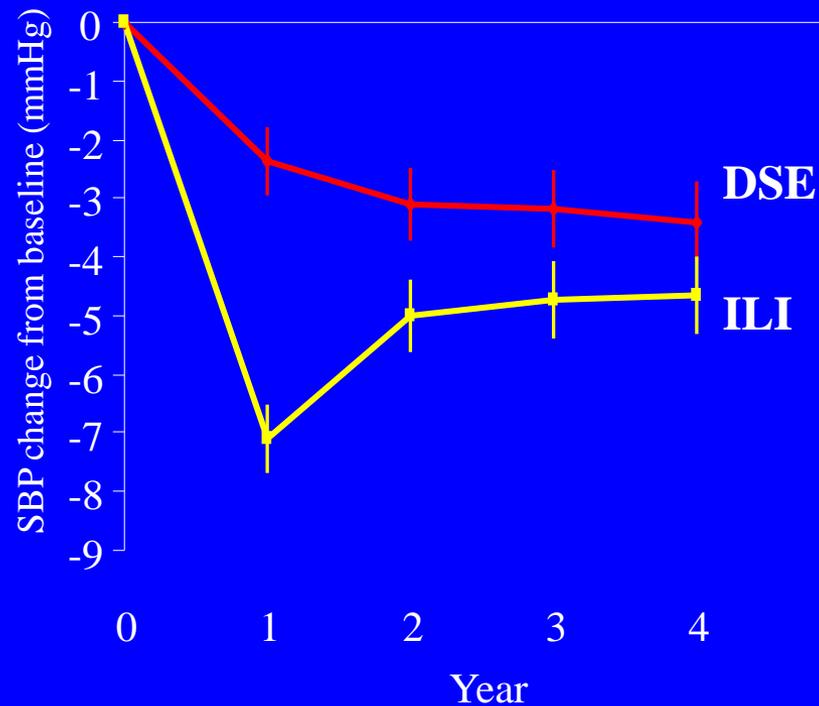
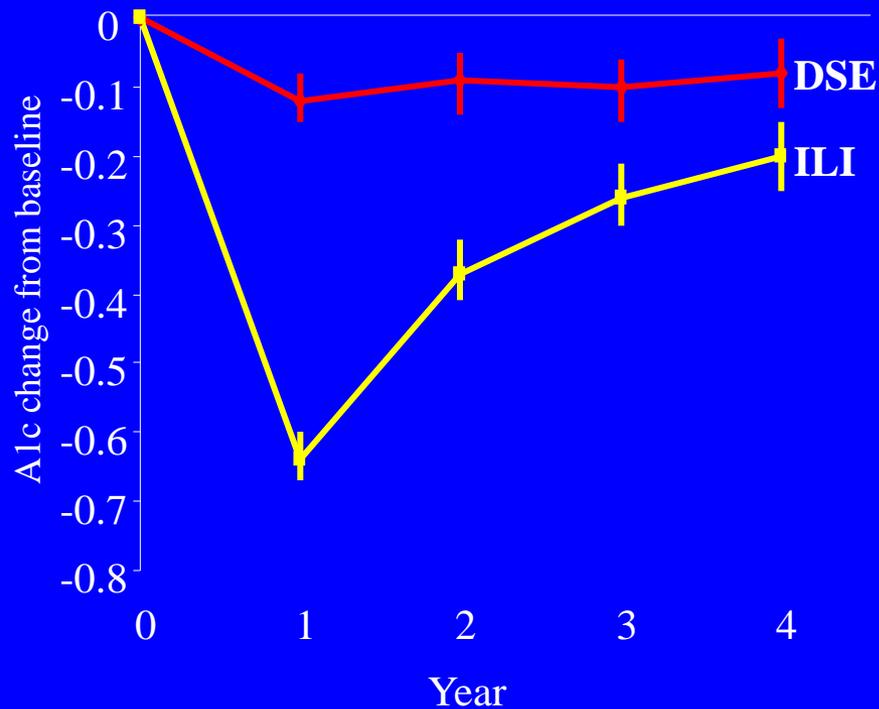
Percentage Reduction in Initial Weight Over 4 Years in ILI and DSE Groups



HbA1c (mg/dl) Change from Baseline

SBP Change from Baseline

Repeated Measures Adjusting for Clinic and Baseline Level
P-value for average effect across all visits: $p < 0.0001$



Conclusions at Year 4

- Positive effects of Lifestyle Intervention across all 4 years on indices of glycemic control.
 - Greater ↓ in HbA1c
 - Greater ↓ in use of diabetes medication & insulin
- Greater ↓ in triglycerides and SBP.
- Greater ↑ in HDL cholesterol and fitness.
- **Further follow-up is needed to determine if the present improvements in weight and CVD risk factors are sufficient to reduce cardiovascular morbidity and mortality.**

High Intensity, On-Site

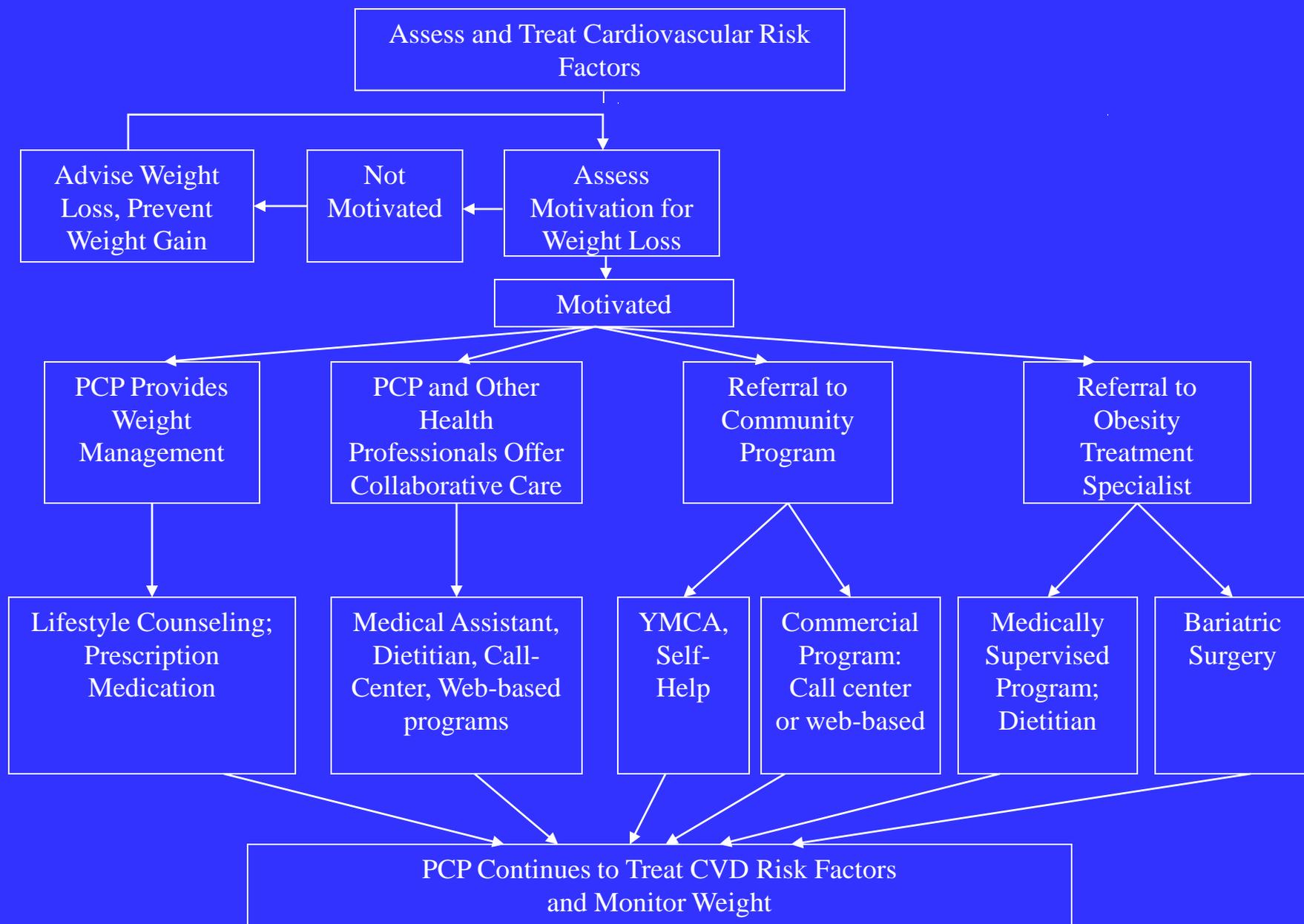
Interventions

- DPP and Look AHEAD are high intensity, on-site interventions, with high costs.
- Low intensity interventions are less effective.
- USPSTF findings:
 - “Interventions with more (counseling) sessions showed more weight loss”
 - 12 to 26 intervention sessions in first year produced mean loss of 4 to 7 kg (6%)
 - < 12 sessions produced loss of 1.5 to 4 kg (2.8%)

Increasing the Availability of High Intensity Interventions

- Medicare (CMS) proposal to cover high intensity counseling in primary care practice
- Month 1: weekly sessions
Months 2-6: twice monthly sessions
- Months 7-12: monthly sessions, provided 3 kg lost in first 6 months
- Interventionists: primary care providers (physicians, nurse practitioners, phys. assistants)
- Dietitians and related professionals currently not included in proposal

Primary Care Practitioners' (PCP) Options for Managing Obesity and Its Complications



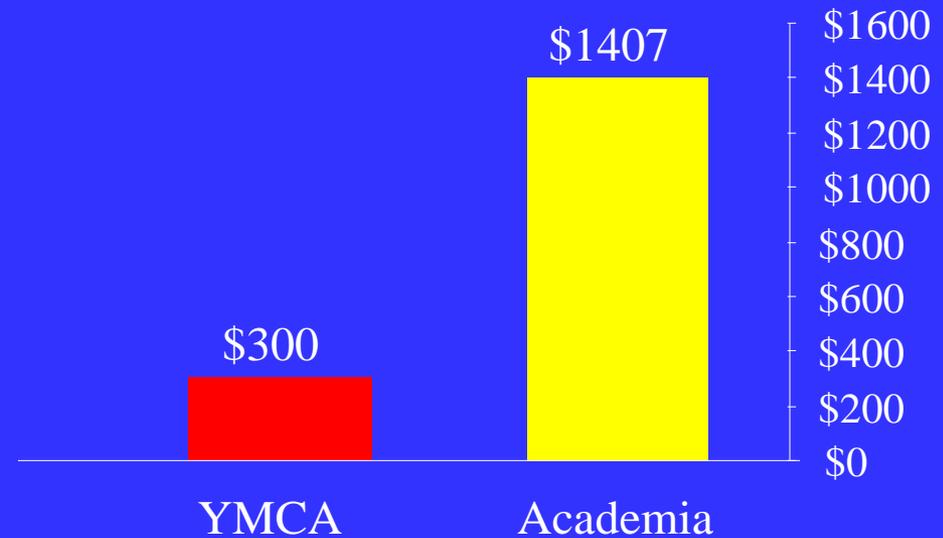
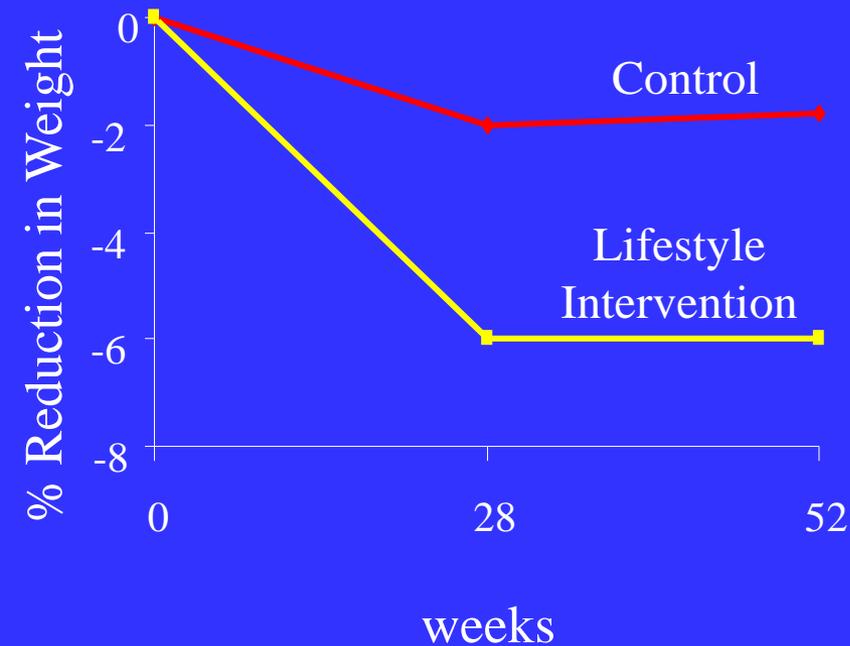
Translating the DPP into the Community with the YMCA



- YMCA wellness instructors trained to deliver DPP
- 16 weekly classroom-style sessions
- Monthly meetings thereafter through 52 weeks
- 92 participants, mean BMI=31.6 kg/m², casual capillary blood glucose of 110-199 mg/dL

Weight at 1 Year

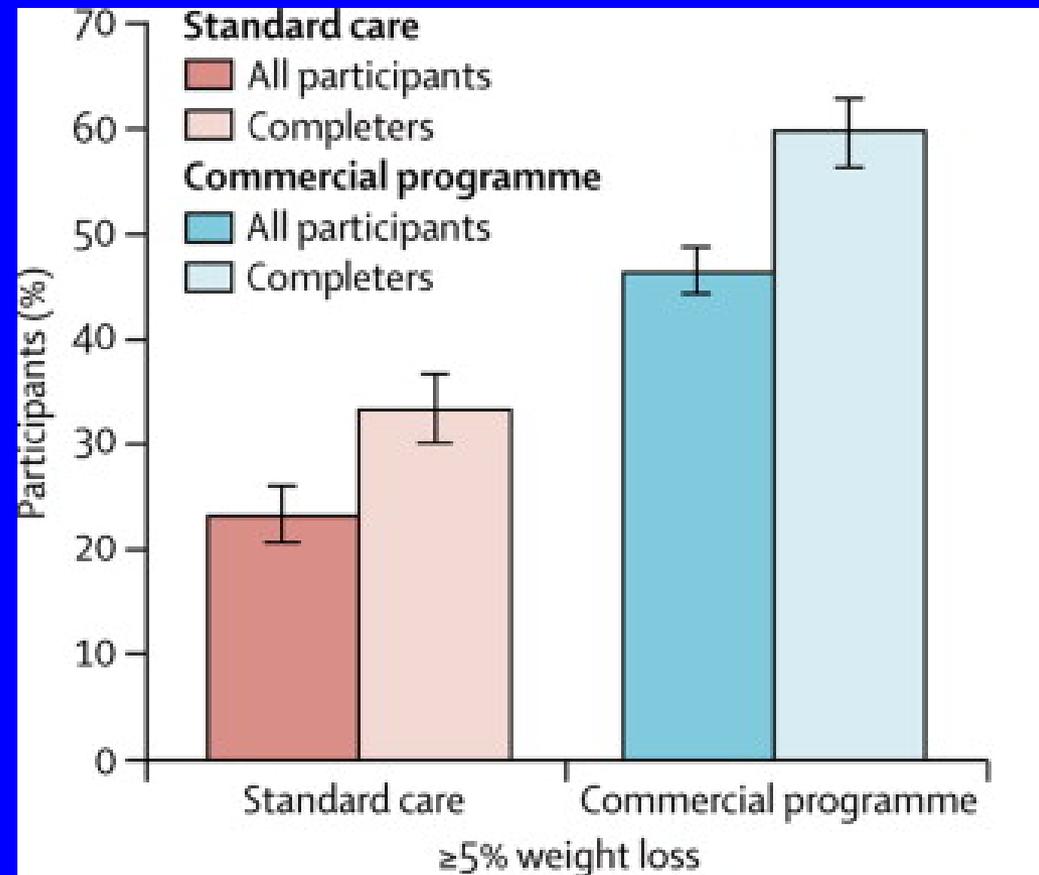
Cost of 1 Year of Treatment



Commercial Weight Loss Programs: Weight Watchers' Trial in Primary

Care

- 772 patients recruited from primary care practices in 3 countries
- Randomly assigned to local Weight Watchers program or Usual Care
- Intervention provided at no charge for 1 year
- Mean losses of 4.1 vs. 1.8 kg, respectively



Commercial Weight Loss Programs: Two-Year Trial of Jenny Craig

- 446 women recruited in four cities
- Randomly assigned to:
 - Usual care
 - Center-based program
 - Telephone based program
- Participants in latter two groups were provided weekly counseling and prepared foods to replace 48% - 68% of energy intake during weight loss portion of trial
- **Two-year mean losses of 2.0, 7.4, and 6.2 kg, respectively**
- Economic analysis needed of all commercial programs

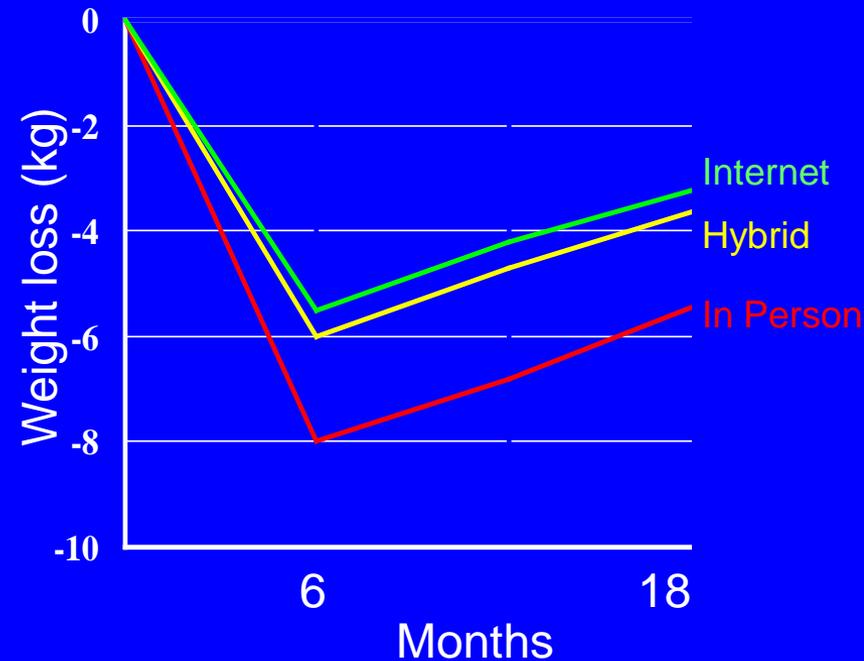
Electronically-Delivered Weight Loss Interventions

- Internet via computer, Smartphone, or tablet
- Cell phone/Text messaging
- Email
- Social networking sites
- Webcam/podcast
- Reach large numbers of people,
potentially at lower costs



Comparison of In-Person and Internet-Delivered Programs

- Weight Loss: months 1-6
 - Weekly group sessions
 - § In person or online (internet)
 - § Hybrid (1 in-person, 3 internet/mo)
- Weight Maintenance: months 6-18
 - § One session per month
 - § Hybrid alternated (in-person/internet)



A Guide to Selecting Treatment: NIH Guidelines*

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Pharmacotherapy



Does adding weight loss medication improve the results of behavioral treatment?

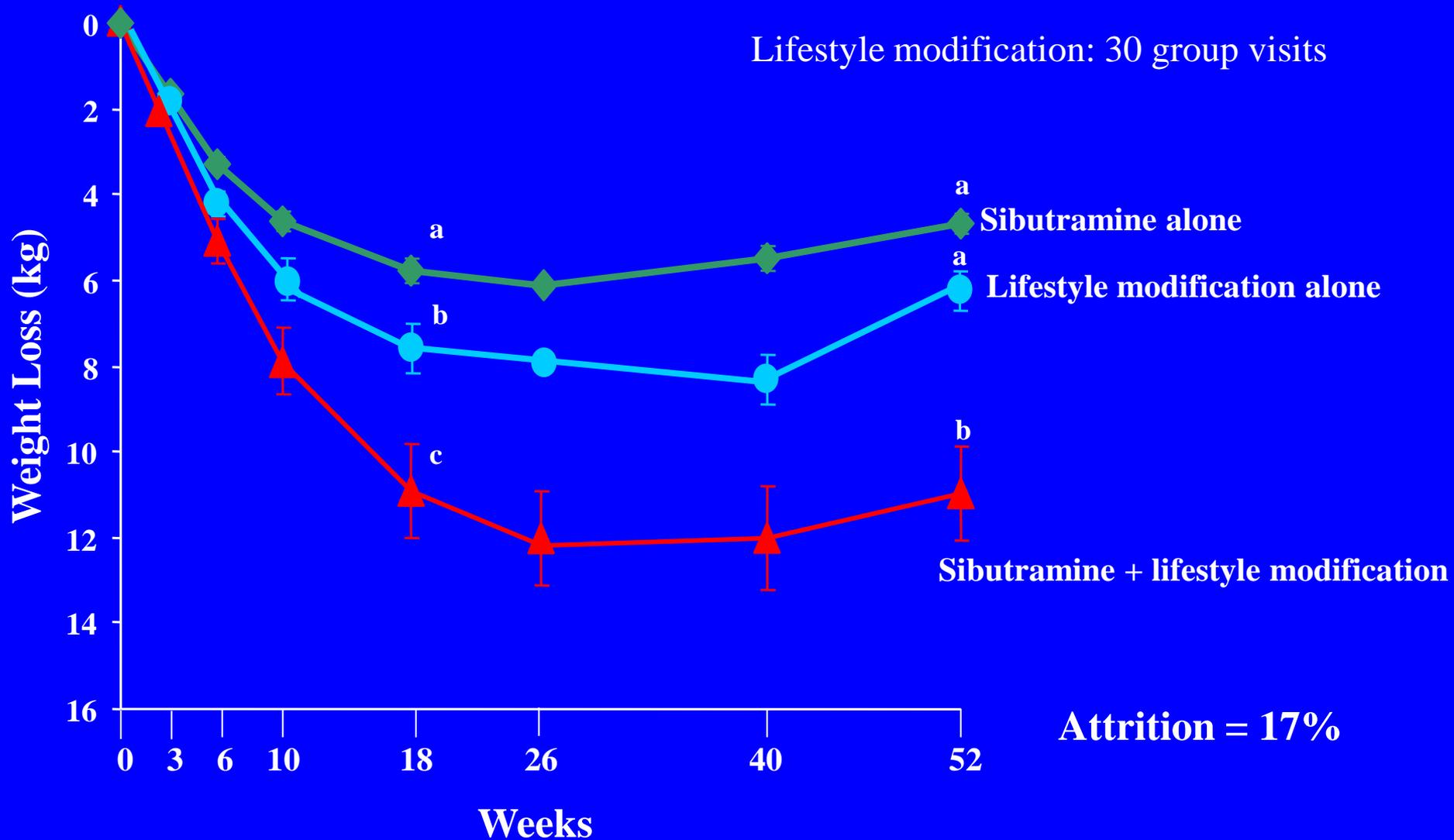
YES

Does adding behavioral treatment improve the results of pharmacotherapy?

YES

Combining Behavioral and Pharmacologic Treatments: Sibutramine removed from the market 10/2010 because of ↑ CVD events

Sibutramine SNRI for Weight Loss



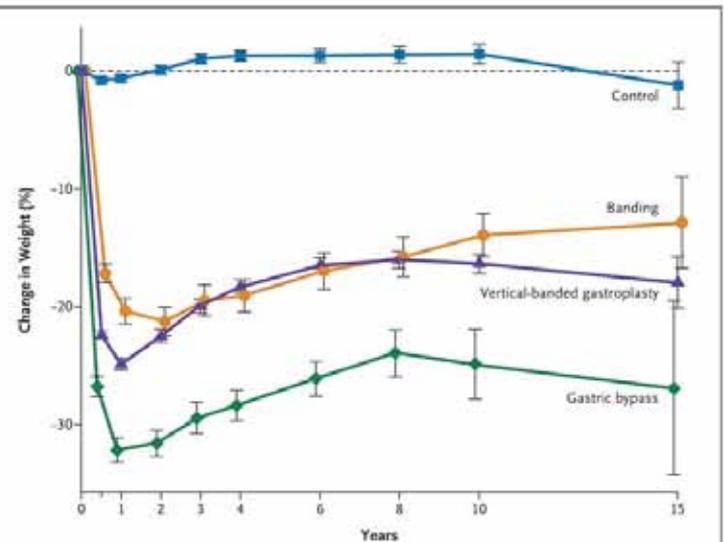
Drugs Approved for Long-Term Use

- ✓ Orlistat (Xenical and alli): lipase inhibitor, blocks absorption of dietary fat by about 1/3. Placebo-subtracted weight loss of 3-4 kg.
- ✗ Lorcaserin: serotonin agonist; 3-4 kg placebo-subtracted loss; concerns with valvular heart disease
- ✗ QNEXA: combination of phentermine and topiramate; 8 kg placebo-subtracted loss. Concerns with cleft lip and palate in infants.
- ✗ Contrave: combination of bupropion and naltrexone; 4 kg placebo-subtracted loss; concerns with ↑ CVD events.

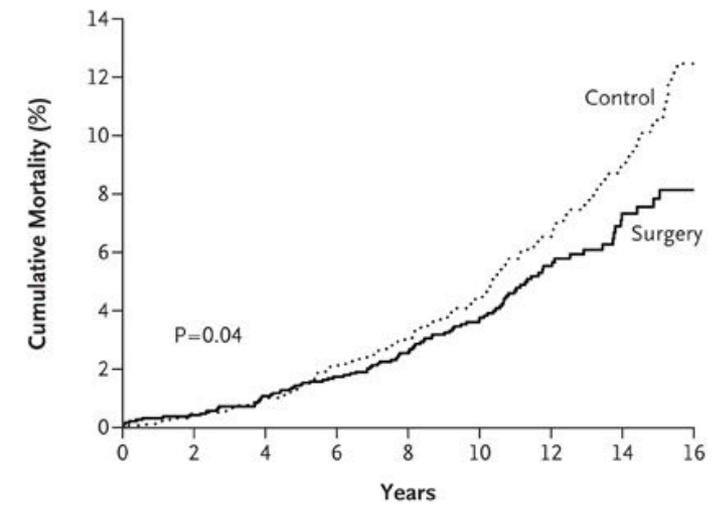
Swedish Obese Subjects (SOS) Study

Mean % Weight Change in the Control and Surgery Groups, by Method of Bariatric Surgery

Unadjusted Cumulative Mortality



No. Examined	2037	1768	1660	1553	1490	1281	982	886	190
Control									
Banding	176	363	357	328	333	298	267	237	52
Vertical-banded gastroplasty	1369	1298	1244	1121	1086	1004	899	746	108
Gastric bypass	265	245	245	211	209	166	92	58	10



No. at Risk	2010	2001	1987	1821	1590	1260	760	422	169
Surgery									
Control	2037	2027	2016	1842	1455	1174	749	422	156

Major Issues in the Management of Obesity

- Who will receive weight management?
- Who will pay for treatment?
- Who will provide obesity treatment?
- How will treatment be delivered?
- How can we prevent the development of overweight and obesity?



Look AHEAD Steering Committee

Principal Investigators

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