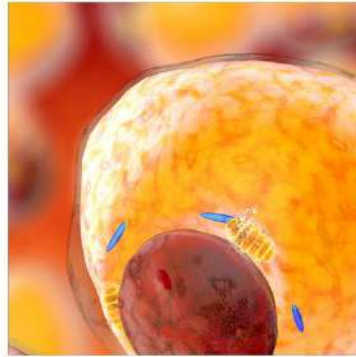


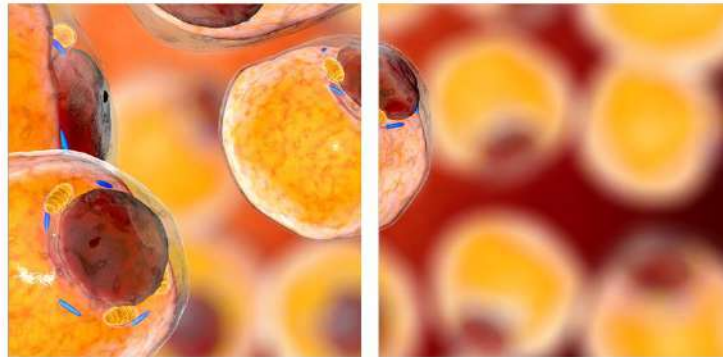
# The 2019 LATAM Diabetes management workshop

Satellite symposium during the ALAD congress



Friday, 1 November 2019  
from 17.00 to 18.30

Punta Cana,  
Dominican Republic



## **Guillermo E. Umpierrez**

Emory University

Section Head, Diabetes & Endocrinology

Grady Health System

Atlanta (GA), USA

### **DISCLOSURE**

Declared no potential conflict of interests

# **Eat well and move yourself!**

## **Obesity management for diabetes prevention**

**Guillermo E. Umpierrez**

# Learning objectives

- Understand the link between changes in habits and obesity/insulin resistance
- Benefits of a healthy lifestyle
- Evaluate different lifestyle intervention strategies for diabetes prevention

# Diabetes Prevention

Lifestyle  
Intervention

Pharmacological  
Intervention

Metabolic  
Surgery

# Interventions to Reduce Risks Associated With Prediabetes

- Therapeutic lifestyle management is the cornerstone of all prevention efforts
- No pharmacologic agents are currently approved for the management of prediabetes in the US
  - Pharmacotherapy targeted at glucose may be considered in high-risk patients after individual risk-benefit analysis

# Lifestyle Intervention in Prediabetes

- Persons with prediabetes should reduce weight by 5% to 10%, with long-term maintenance at this level
  - A program of regular moderate-intensity physical activity for 30-60 minutes daily, at least 5 days a week, is recommended
  - A diet that includes caloric restriction, increased fiber intake, and (in some cases) carbohydrate intake limitations is advised

# **Position of the Academy of Nutrition and Dietetics: The Role of Medical Nutrition Therapy and Registered Dietitian Nutritionists in the Prevention and Treatment of Prediabetes and Type 2 Diabetes**

- Medical nutrition therapy (MNT) provided by registered dietitian nutritionists (RDNs).
- For weight loss, the RDN should schedule at least 14 MNT encounters (either individual or group) over a period of at least 6 months
- To maintain weight loss, the nutrition practice guideline recommends “at least monthly MNT encounters over a period of at least 1 year



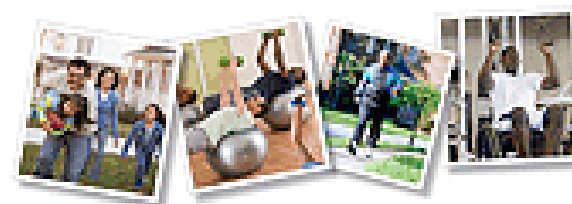
# Lifestyle Modification: Physical Activity Guidelines and Recommendations

- Physical activity (not “exercise”)
- Some is better than none
- $\geq 150$  min/wk of moderate intensity activity
- Both aerobic (endurance) and strengthening (resistance) activity are beneficial

2008



## 2008 Physical Activity Guidelines for Americans



*Be Active, Healthy, and Happy!*

[www.health.gov/paguidelines](http://www.health.gov/paguidelines)

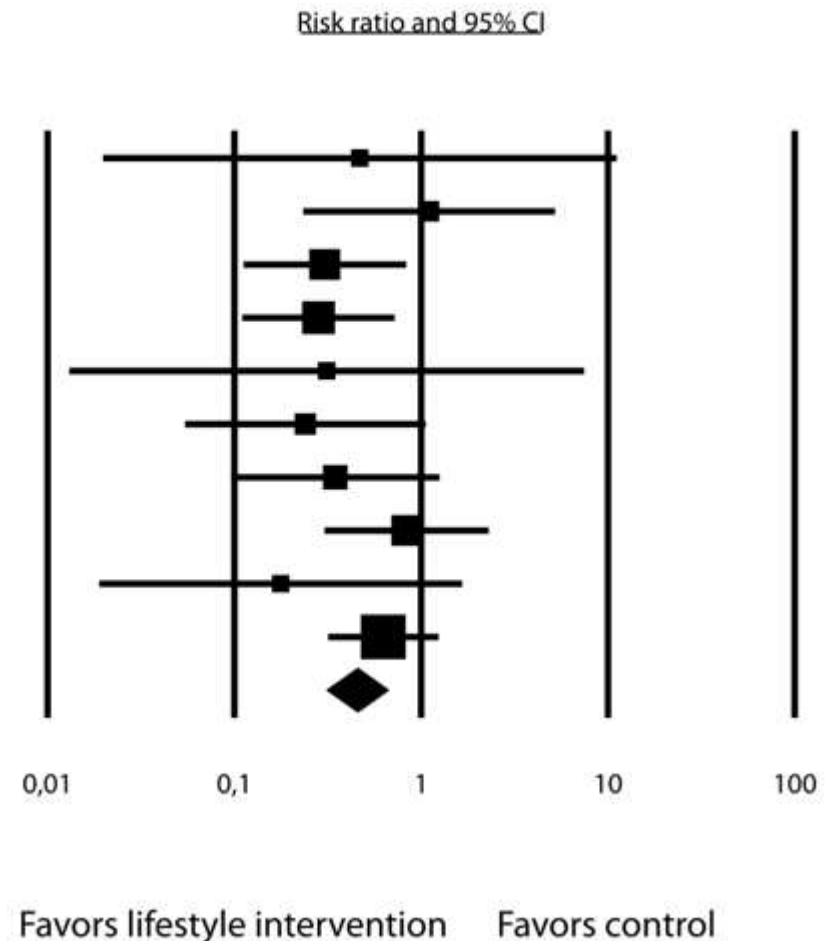


<http://www.health.gov/gaguidelines>

# Effects of lifestyle changes on adults with prediabetes: A systematic review and meta-analysis

## Type 2 diabetes after one year

Study name	Statistics for each study			Typ 2 Diabetes / Total	
	Risk ratio	Lower limit	Upper limit	Lifestyle intervention	Control
Brazilian LIS, 2010	0,47	0,02	11,00	0 / 21	1 / 30
EDIPS, 2009	1,10	0,24	5,15	3 / 39	3 / 43
Finnish DPS, 1999-2008	0,31	0,11	0,82	5 / 256	16 / 250
Lindahl et al., 2009	0,28	0,11	0,71	5 / 70	20 / 79
O'Brien et al., 2017	0,31	0,01	7,35	0 / 30	1 / 28
SLIM Study, 2006-2011	0,24	0,06	1,04	2 / 50	10 / 60
Wong et al., 2013	0,35	0,10	1,24	3 / 54	8 / 50
Xu et al., 2013	0,84	0,31	2,27	6 / 41	7 / 40
Yates et al., 2009	0,18	0,02	1,64	1 / 64	3 / 34
Zensharen Study, 2011	0,63	0,32	1,22	13 / 311	22 / 330
	0,46	0,32	0,66		



Data from 22 RCTs involving 9796 people with prediabetes compared lifestyle intervention with treatment as usual.

# Effects of lifestyle changes on adults with prediabetes: A systematic review and meta-analysis

## Type 2 diabetes after three years

Study name	Statistics for each study			Type 2 diabetes / Total		Risk ratio and 95% CI
	Risk ratio	Lower limit	Upper limit	Lifestyle intervention	Control	

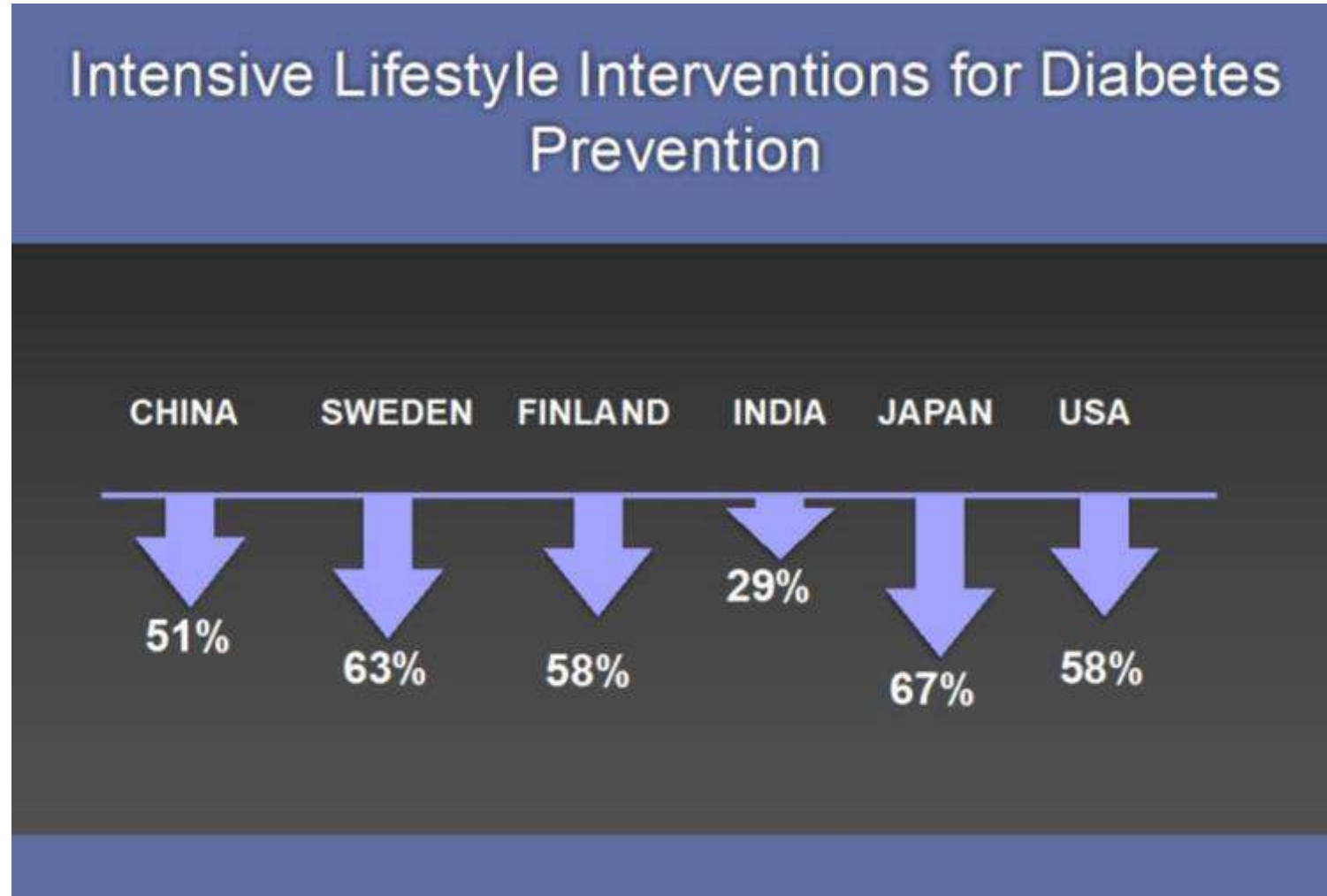
B  
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Lifestyle intervention is effective in preventing or delaying progression to type 2 diabetes. After one and three years of lifestyle intervention, there is a 36% - 54% lower risk of progressing to type 2 diabetes compared to treatment as usual

After one year: 4% vs.10%; RR 0.46 [95% CI 0.32,0.66];

After three years: 14% vs.23%, RR 0.64 [95% CI 0.53,0.77]

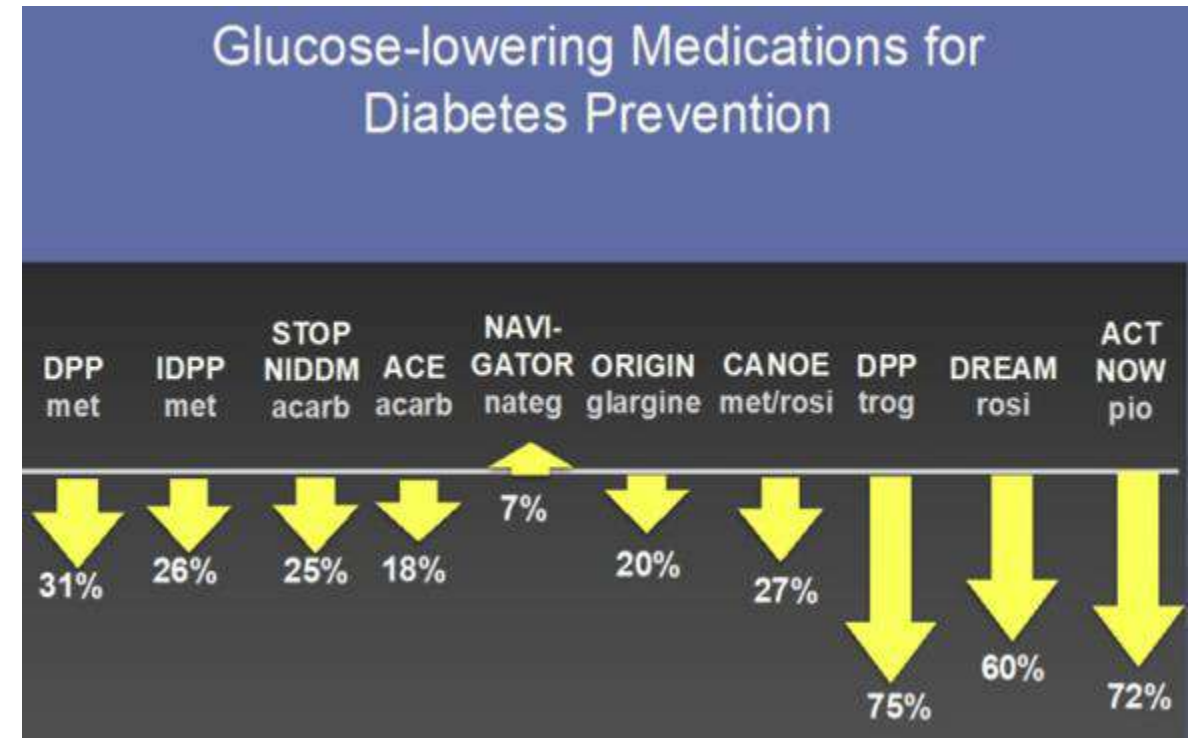
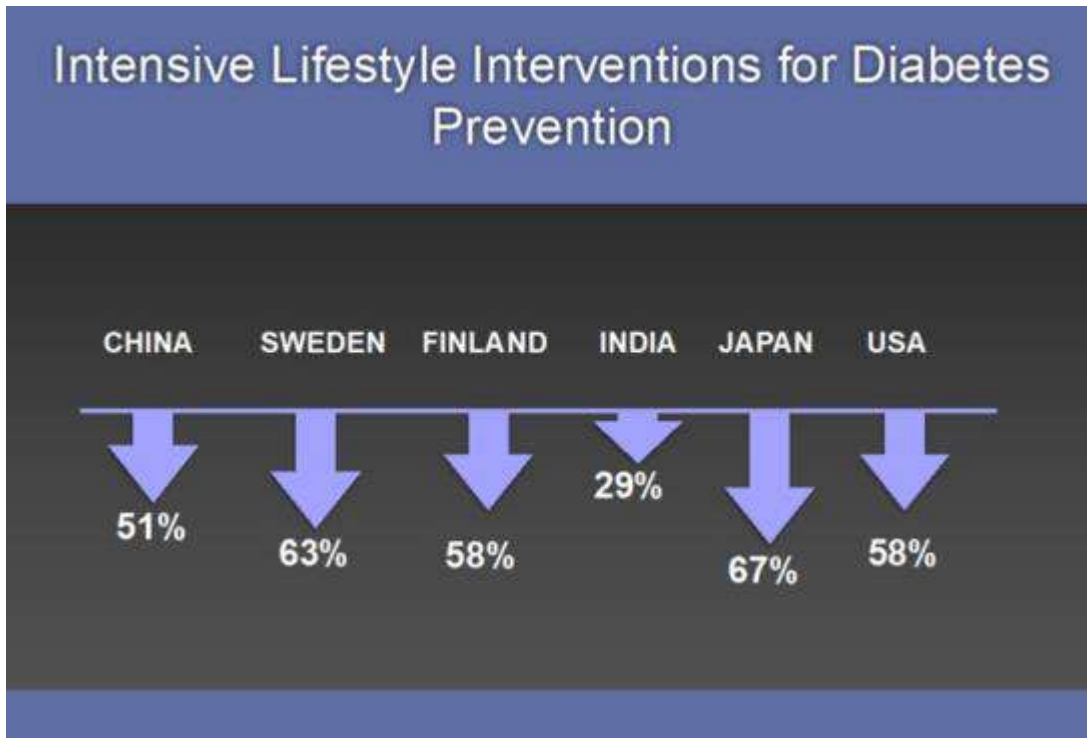
# Major trials using intensive lifestyle interventions for diabetes prevention



# Prediabetes: Randomized Controlled Trials

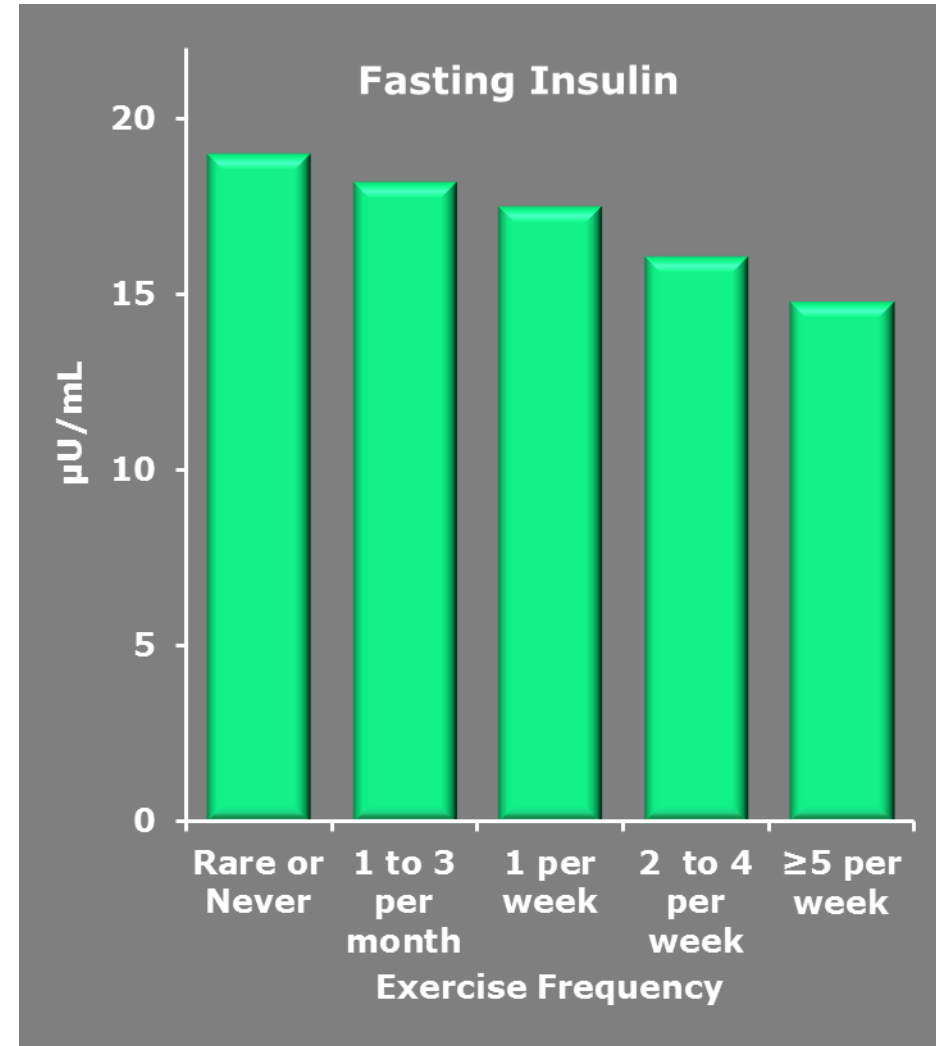
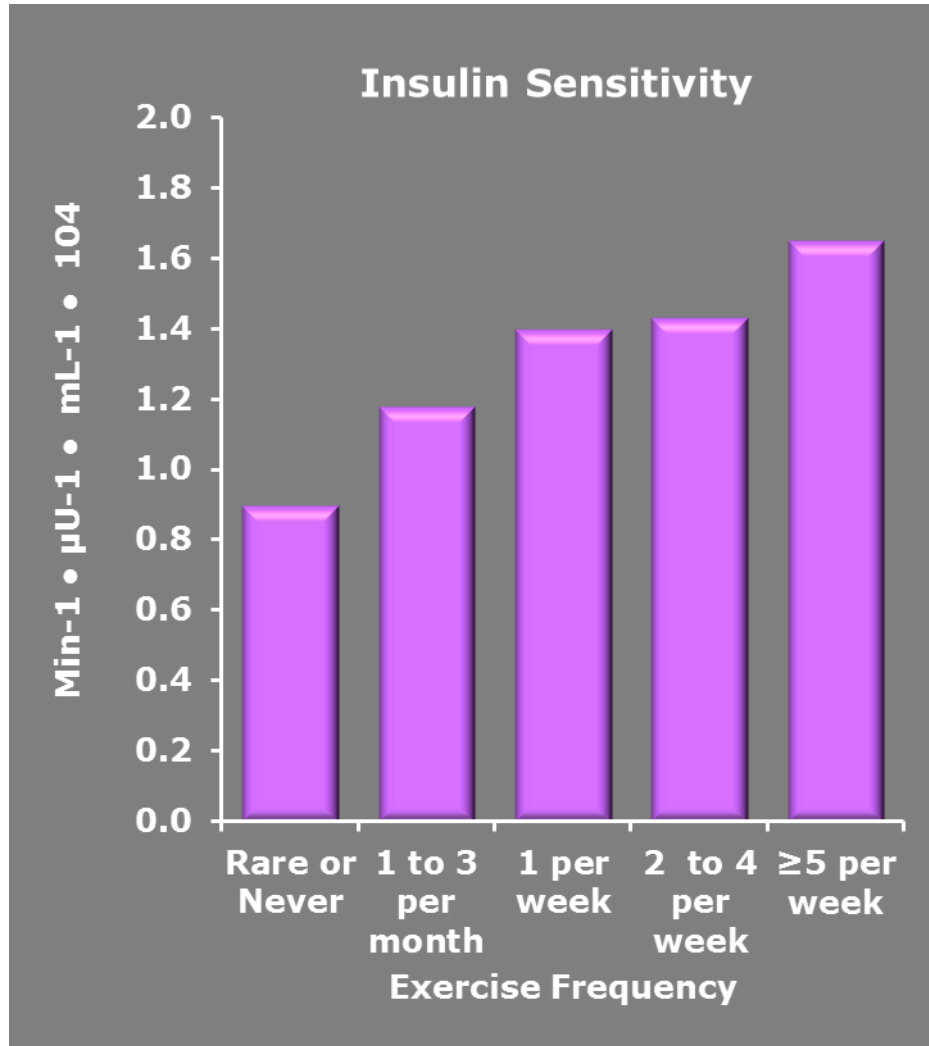
## Intensive lifestyle interventions

## Glucose-lowering medications



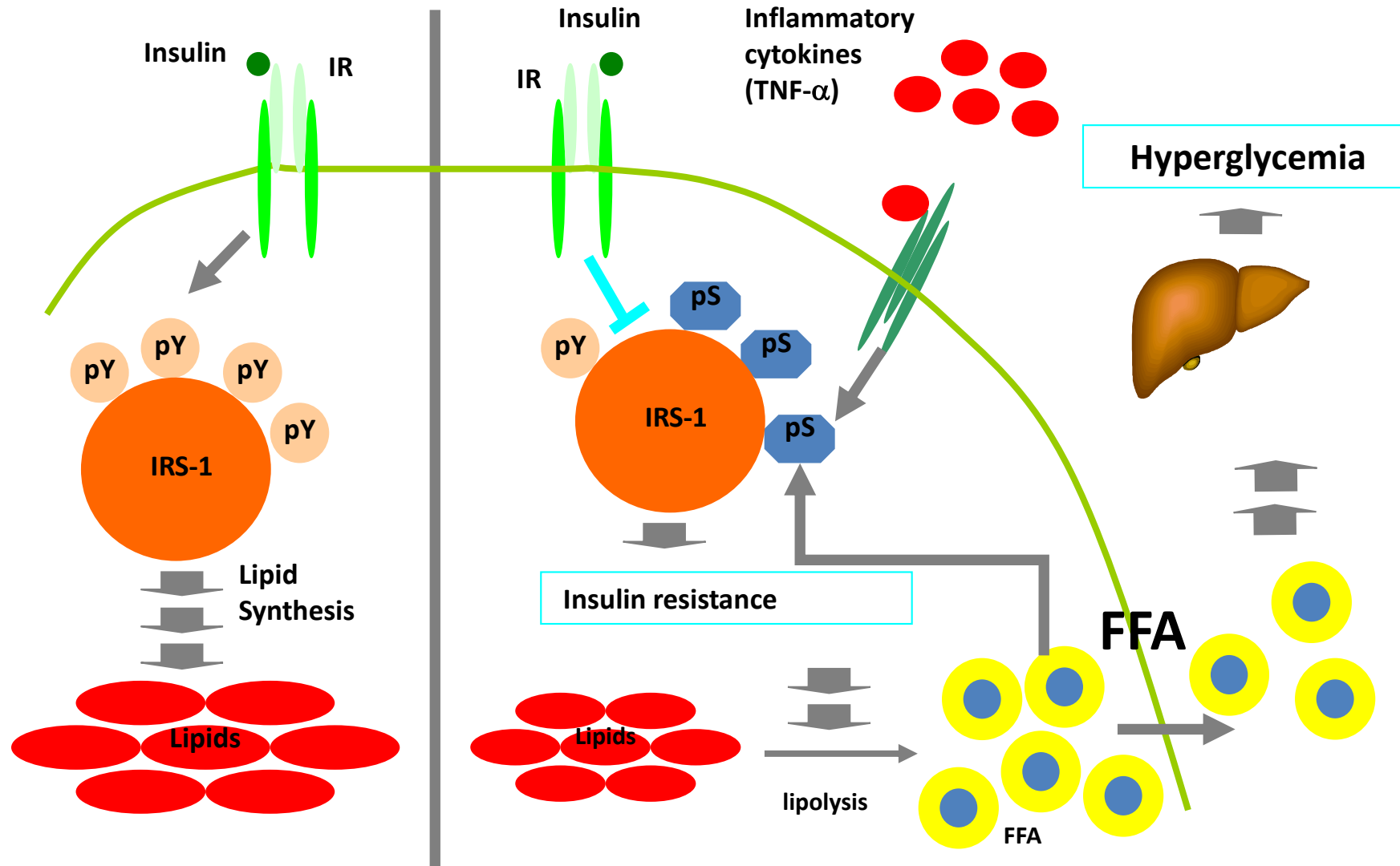
Lifestyle interventions have utilized a low fat (<30% calories from fat; <10% from saturated fat) hypocaloric diet and moderate intensity exercise ~150 minutes per week for the purpose of 5-7% weight reduction.

# Association Between Insulin Sensitivity and Physical Exercise: The IRAS Study



IRAS=Insulin Resistance Atherosclerosis Study

# Inflammation-Induced Hyperglycemia



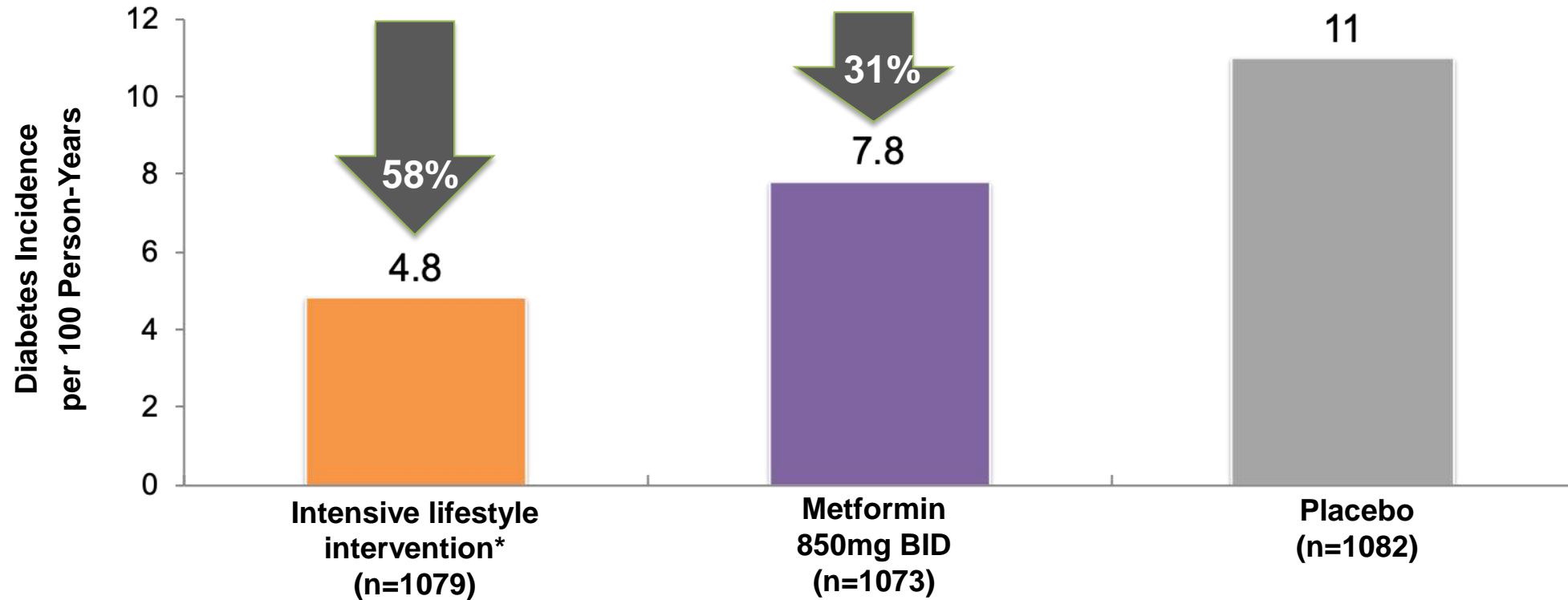
# Diabetes Prevention Program

- Enrolled 3,234 subjects-IGT plus elevated FPG
  - ◆ 1043 men, 2191 women
  - ◆ Mean age 51 yr
  - ◆ Mean BMI 34 Kg/m<sup>2</sup>
- **Intervention:**
  - ◆ Intensive lifestyle intervention - 7% wt. loss, 3h/wk exercise
  - ◆ Standard lifestyle recommendations plus metformin
  - ◆ Standard lifestyle recommendations plus placebo
- **Study groups:**
  - ◆ Fasting glucose between 95 – 125 mg/dL
  - ◆ IGT based on a 75 g OGTT (2 h glucose 140 199 mg/dl)



# Intensive Lifestyle Intervention Effectively Prevents Progression From IGT to T2D

## Diabetes Prevention Program (N=3234)

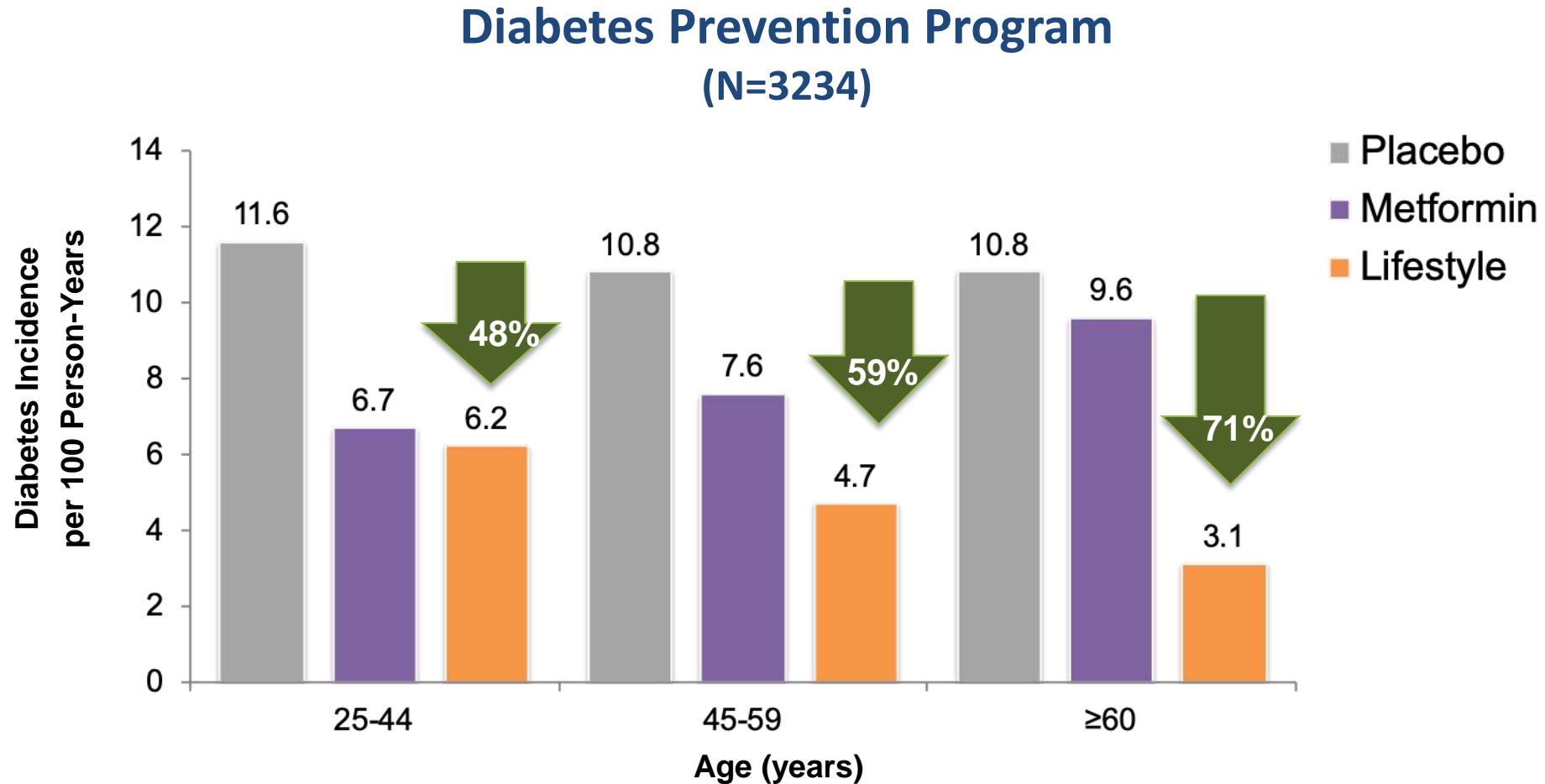


\*Goal: 7% reduction in baseline body weight through low-calorie, low-fat diet and  $\geq 150$  min/week moderate intensity exercise .

IGT, impaired glucose tolerance; T2D, type 2 diabetes.

DPP Research Group. *N Engl J Med.* 2002;346:393-403.

# Lifestyle Intervention More Effectively Prevents Diabetes as Populations Age (>60 years)

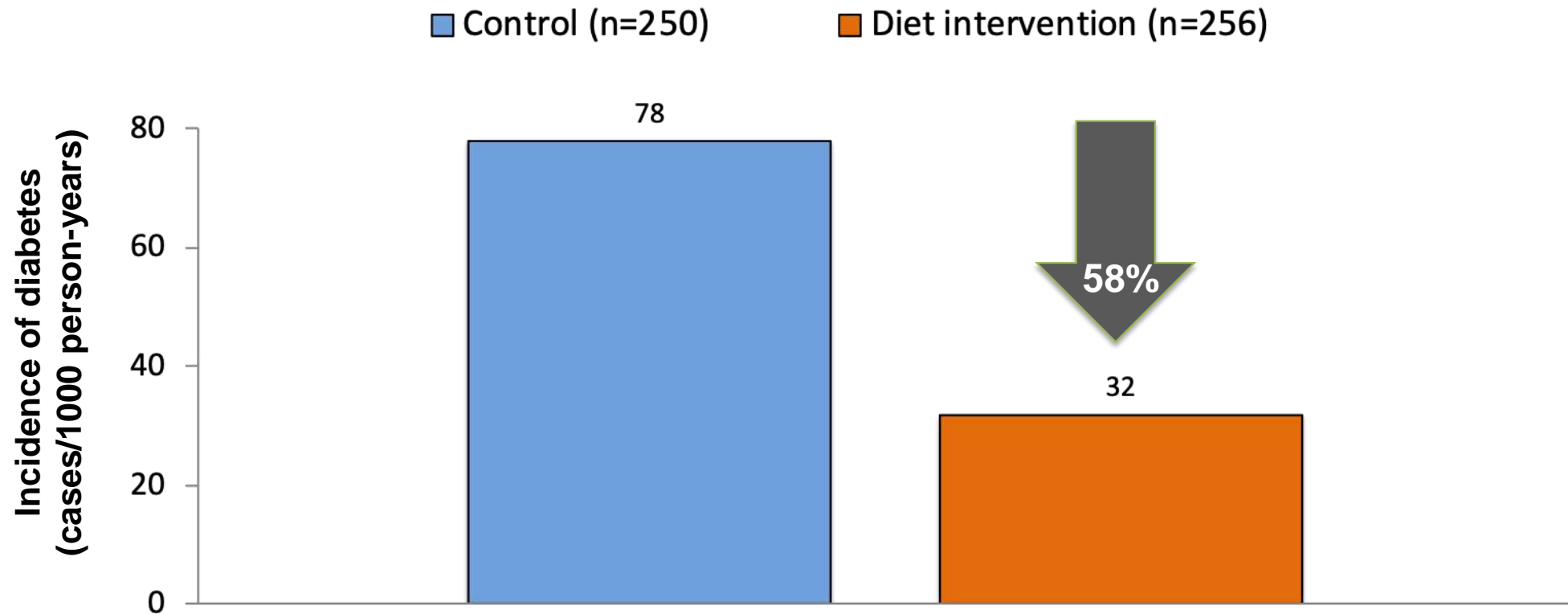


\*Goal: 7% reduction in baseline body weight through low-calorie, low-fat diet and ≥150 min/week moderate intensity exercise .

DPP Research Group. *N Engl J Med.* 2002;346:393-403.

# Cumulative Incidence of Diabetes Over 4 Years

## The Finnish Diabetes Prevention Study

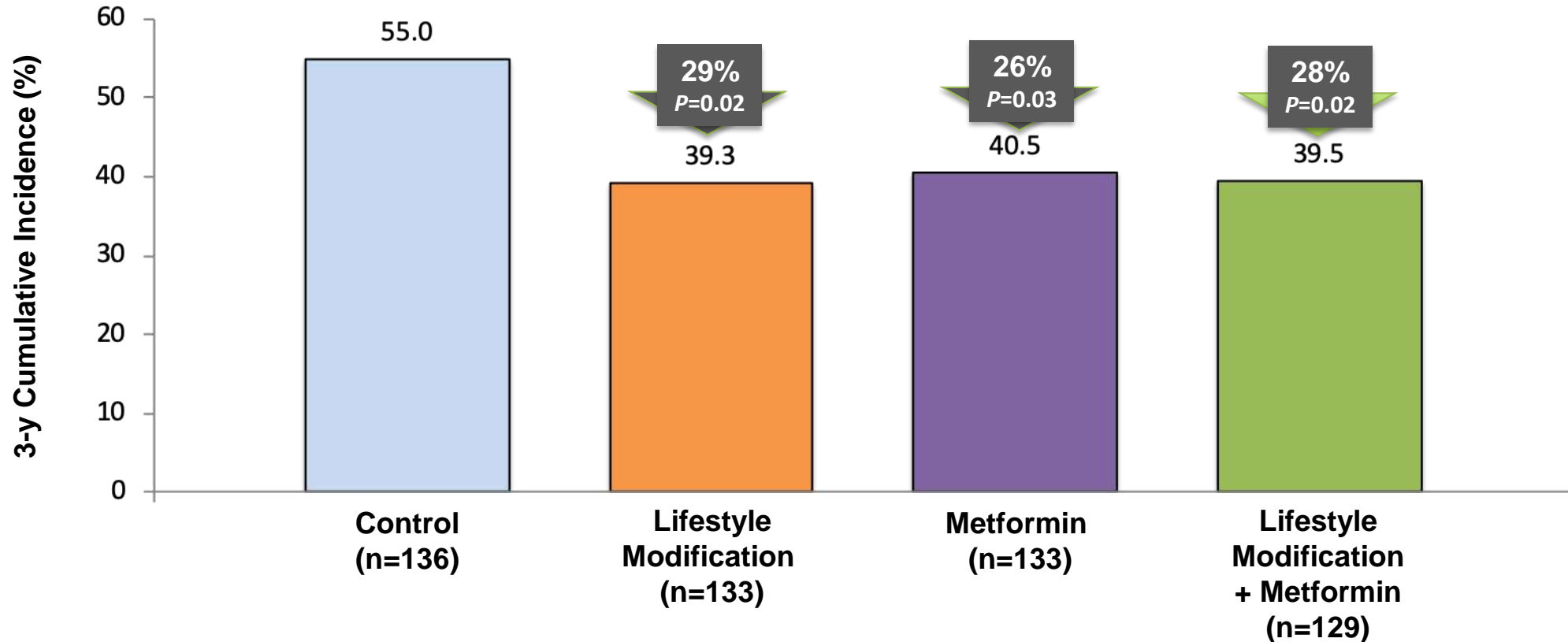


DBP, diastolic blood pressure; SBP, systolic blood pressure.

Tuomilehto J, et al. *N Engl J Med.* 2001;344:1343-1350.

# Effect of Lifestyle Modification and Metformin on Cumulative Diabetes Incidence

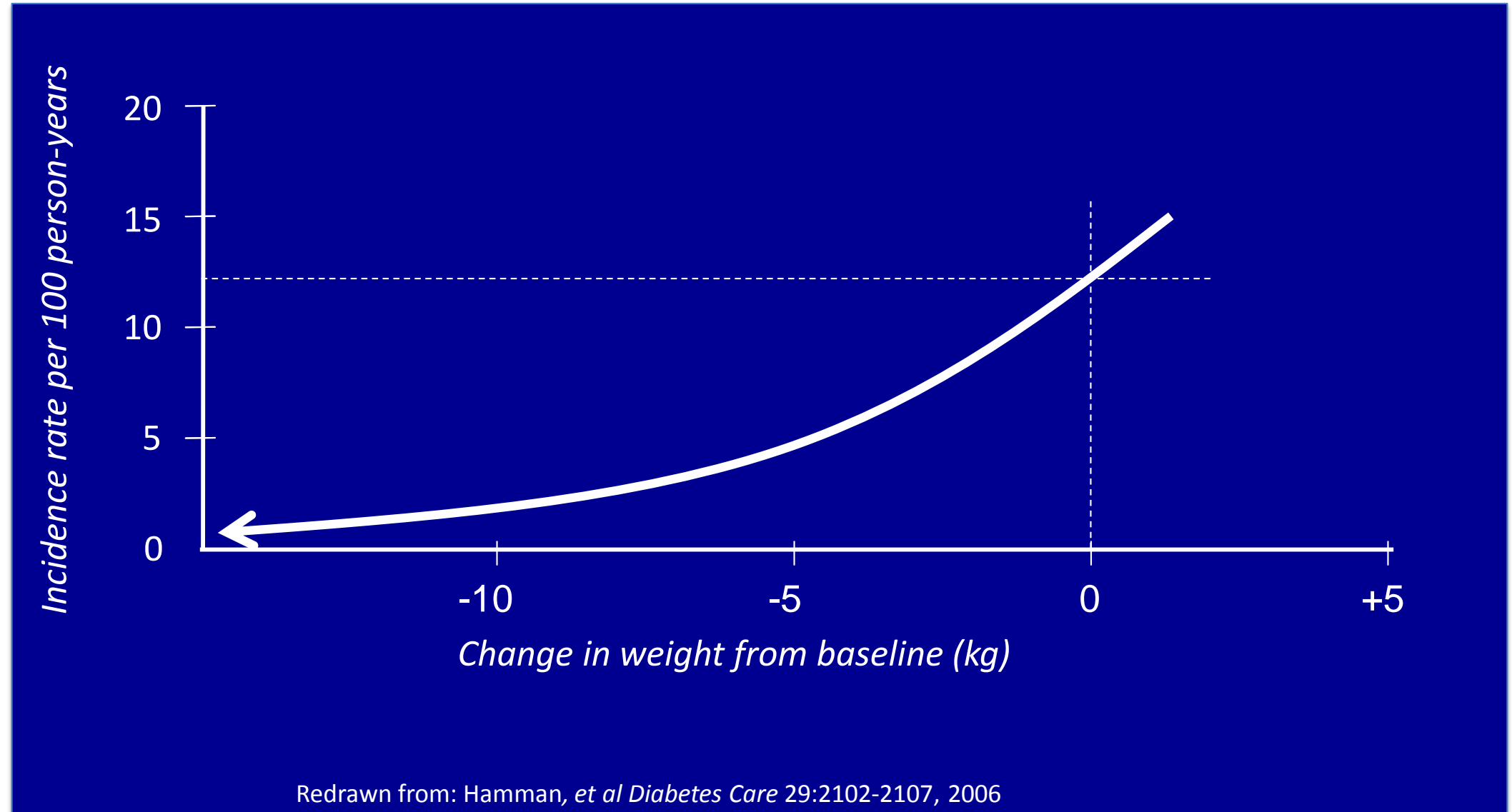
## The Indian DPP (N=531)



DPP, Diabetes Prevention Program; LSM, lifestyle modification; MET, metformin; RRR, relative risk reduction.

Ramachandran A, et al. *Diabetologia*. 2006;49:289-297.

# How much weight loss is needed to prevent type 2 diabetes? The DPP experience





# National Diabetes Prevention Program



CDC-approved  
DPP curriculum



12 month  
Core Benefit



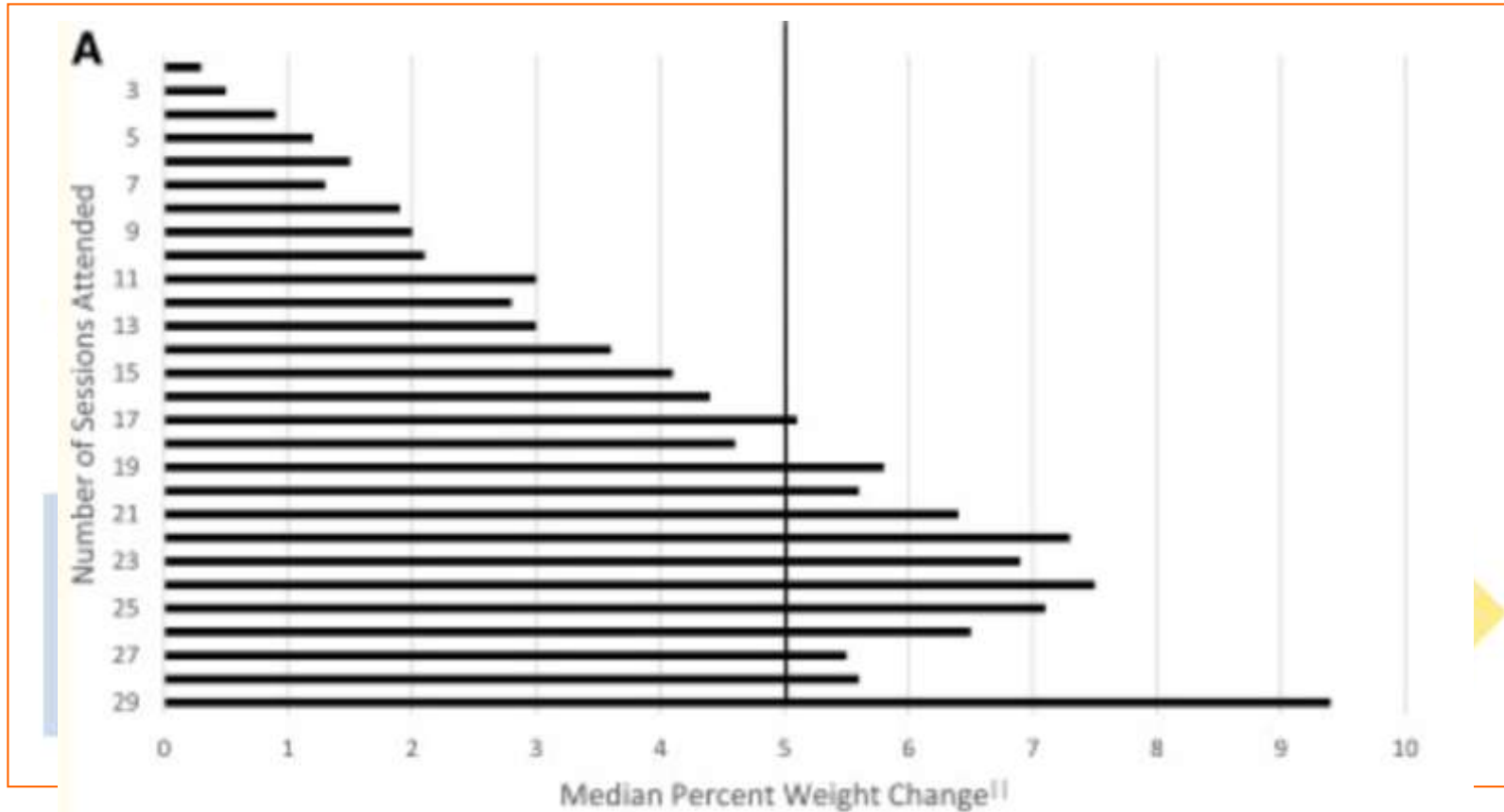
Maintenance  
Sessions

- Minimum of 16 core sessions
- First 6 months

- Monthly maintenance sessions
- Second 6 months

**AFTER 1<sup>ST</sup> YEAR: monthly maintenance sessions IF patient achieves & maintains minimum weight loss**

# National Diabetes Prevention Program



Data from 14,747 adults enrolled 2/2012-2016:

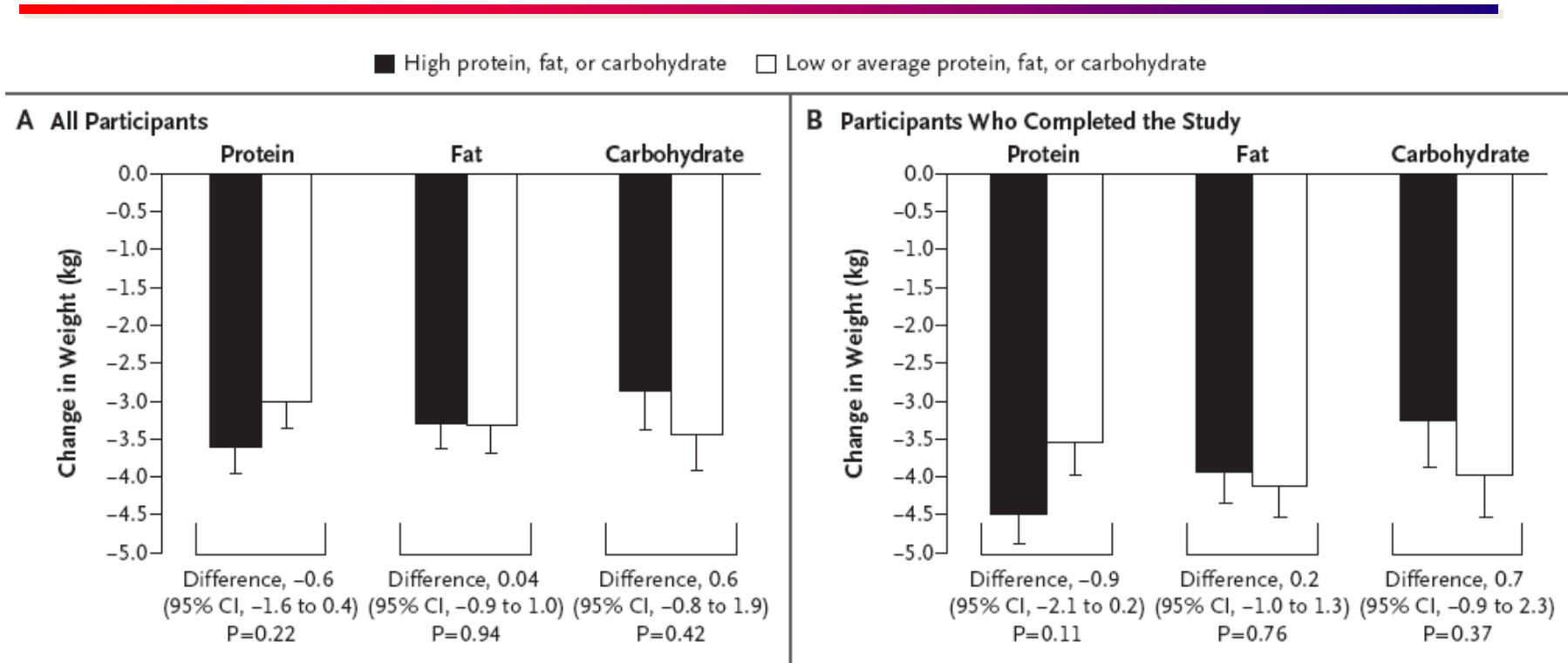
**35.5% achieved the 5% weight loss (average weight loss 4.2%; median weight loss 3.1%)**  
**152 min of physical activity with 41.8% meeting the physical activity goal of 150 min per week.**



**We all know what to eat and not to eat  
but we still don't lose weight!**

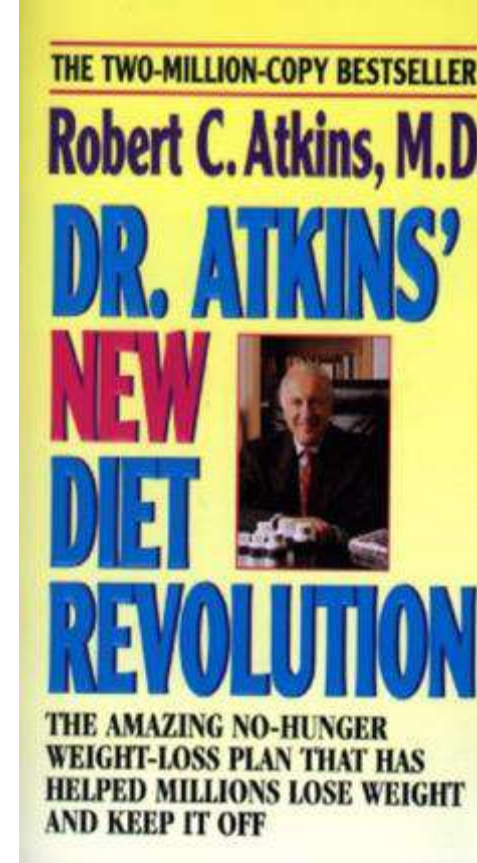
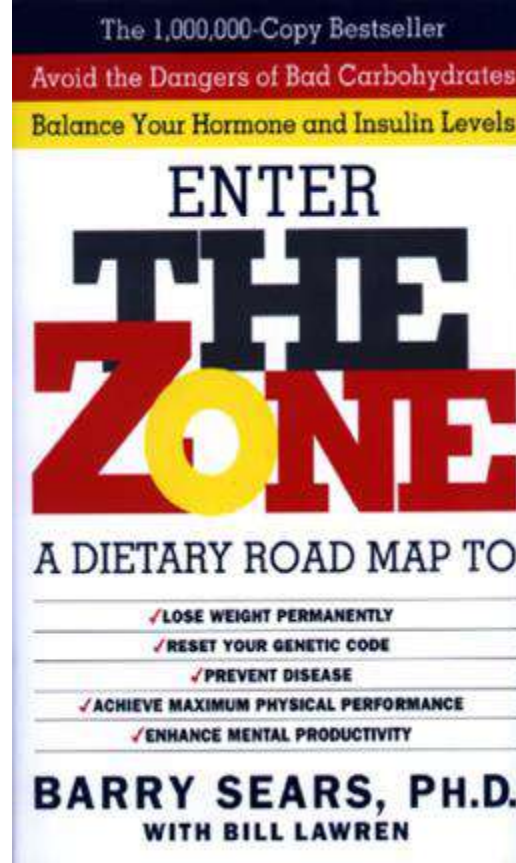


## Comparison of Weight-Loss Diets with Different Compositions of Fat, Protein, and Carbohydrates



### Conclusions

Reduced-calorie diets result in clinically meaningful weight loss regardless of which macronutrients they emphasize.

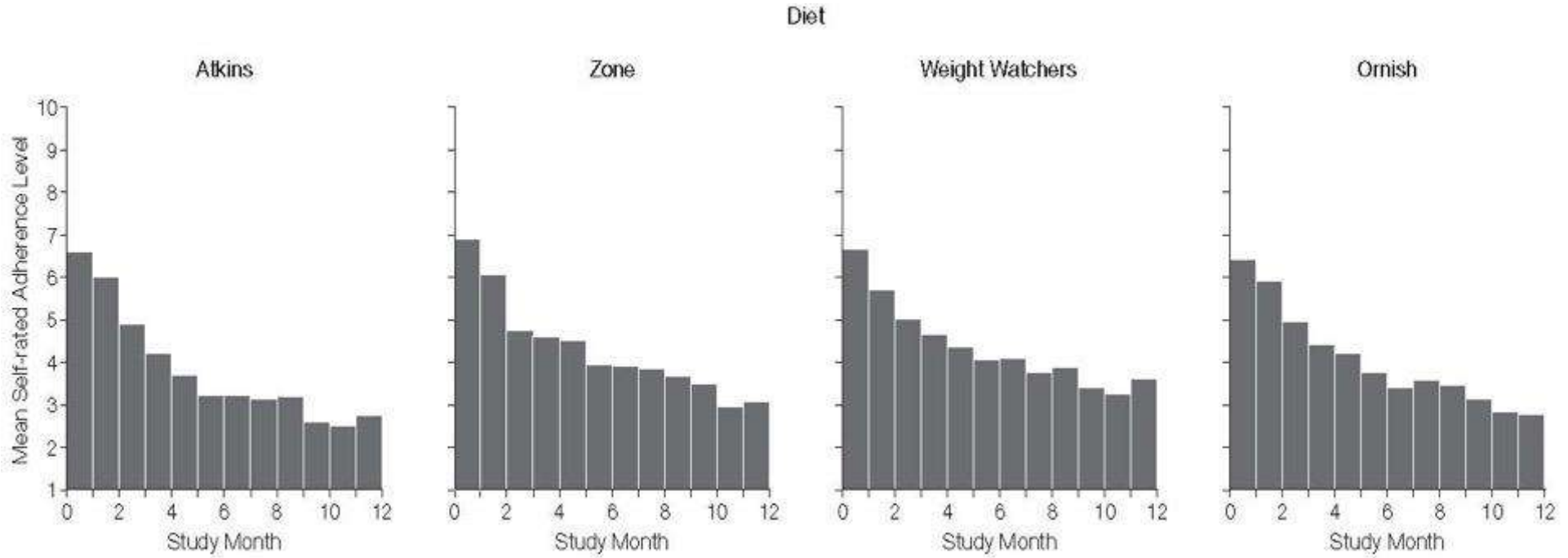


- 56% Carbs
- 20% Protein
- 24% Fat

- 40% Carbs
- 30% Protein
- 34% Fat

- 20% Carbs
- 30% Protein
- 60% Fat

# Adherence to Any Diet Is Difficult

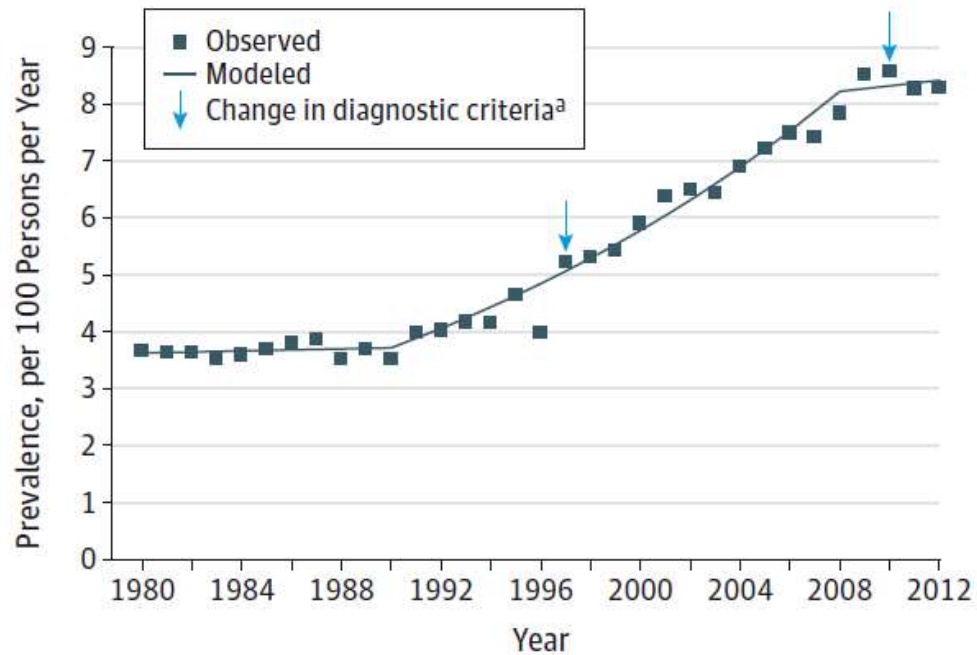


-40-50% of participants did not complete the study  
Re: Difficult to follow dietary modifications

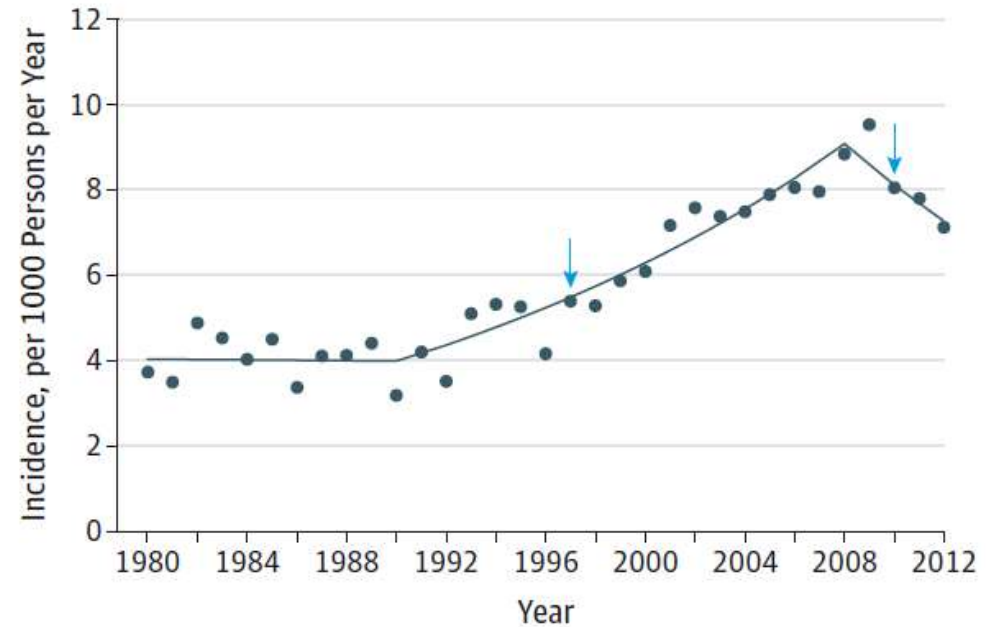
# Prevalence and Incidence Trends for Diagnosed Diabetes Among Adults Aged 20 to 79 Years, United States, 1980-2012

Linda S. Geiss, MA; Jing Wang, MPH; Yiling J. Cheng, MD, PhD; Theodore J. Thompson, MS; Lawrence Barker, PhD;  
Yanfeng Li, MD; Ann L. Albright, PhD, RD; Edward W. Gregg, PhD

**A** Prevalence



**B** Incidence



# Prevalence and Incidence Trends for Diagnosed Diabetes Among Adults Aged 20 to 79 Years, United States, 1980-2012

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New cases of diagnosed **diabetes** in the **U.S.** decreased by **35 percent** since a peak in 2009 – the first sign that efforts to stop the nation's **diabetes** epidemic are working, CDC researchers report. New cases have **declined** from 1.7 million new cases per year in 2008 to 1.3 million new cases in 2017. May 28, 2019

 Centers for Disease Control and Prevention (.gov) › media › releases › p...

[After 20-year increase, New Diabetes Cases Decline | CDC ...](#)

Diabetes prevalence in the US leveling off?

# Conclusions

- Therapeutic lifestyle management is the cornerstone of all prevention efforts
- Intensive lifestyle results in improvement in glycemic control, weight loss and increased activity level
- Intensive lifestyle intervention reduced the development of diabetes by 40-60%

**Thank you!**