

Importance of Physical Activity in Maintaining Calorie Balance & Health

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Lifestyle Risk Factors Ranked within each Country

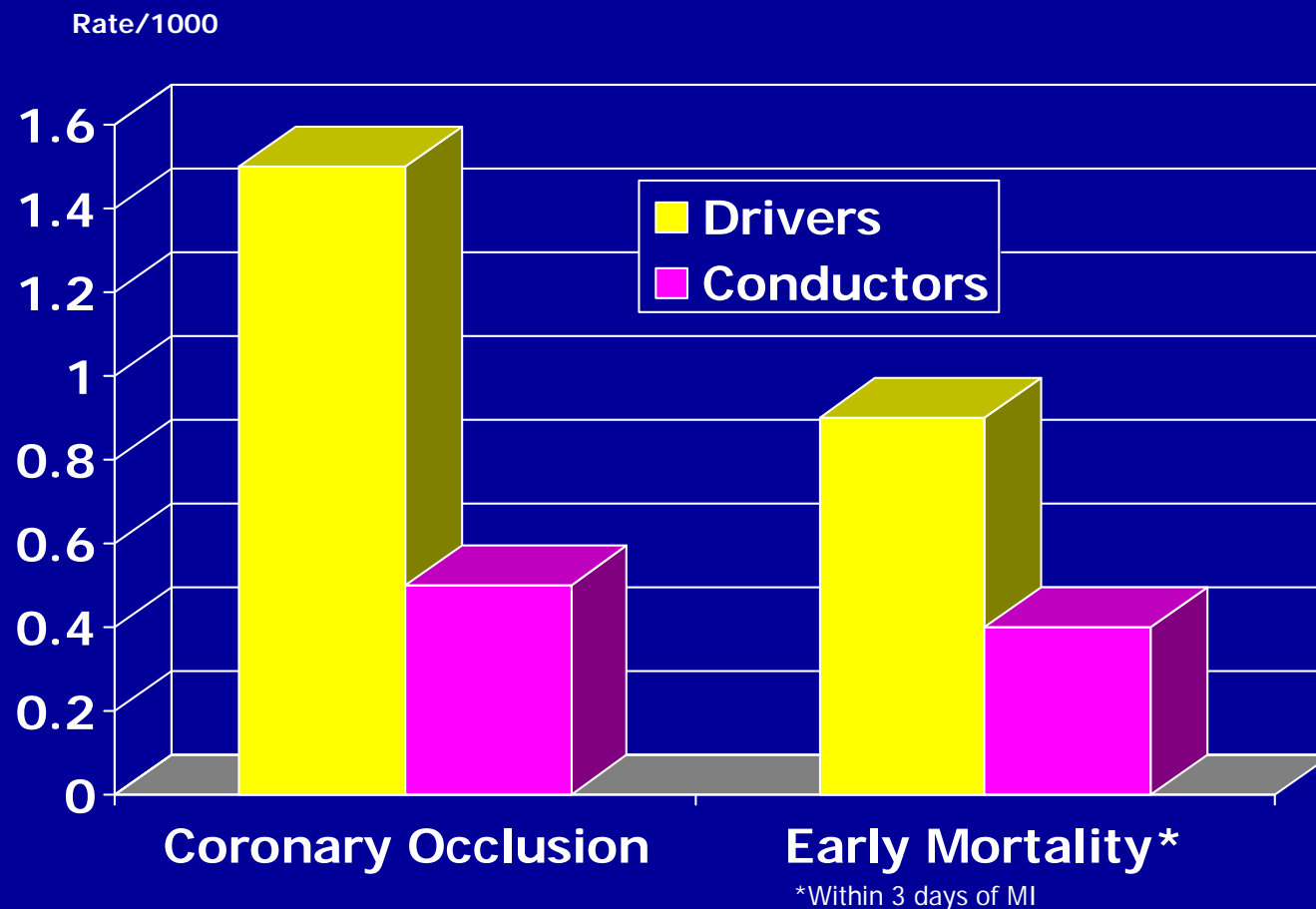
	Stress	Lack of physical activity	Obesity	Poor nutrition	Tobacco use	Present- eeism	Substance Abuse
United States	1	3	2	4	5	6	7
Canada	1	2	3	4	6	5	7
Mexico	1	2	3	4	6	5	7
Brazil	1	2	3	5	7	6	4
Europe	1	3	4	7	2	5	6
Asia Pacific	1	2	3	6	4	5	7
China	2	1	4	7	3	6	5
India	1	2	3	6	4	5	7
Southeast Asia*	1	2	3	6	5	4	7
Singapore	1	2	4	5	6	3	7

* South East Asia includes Malaysia, Philippines and Singapore

Note: Rankings based on companies responding 5, 6 or 7 on a 7-point extent scale.



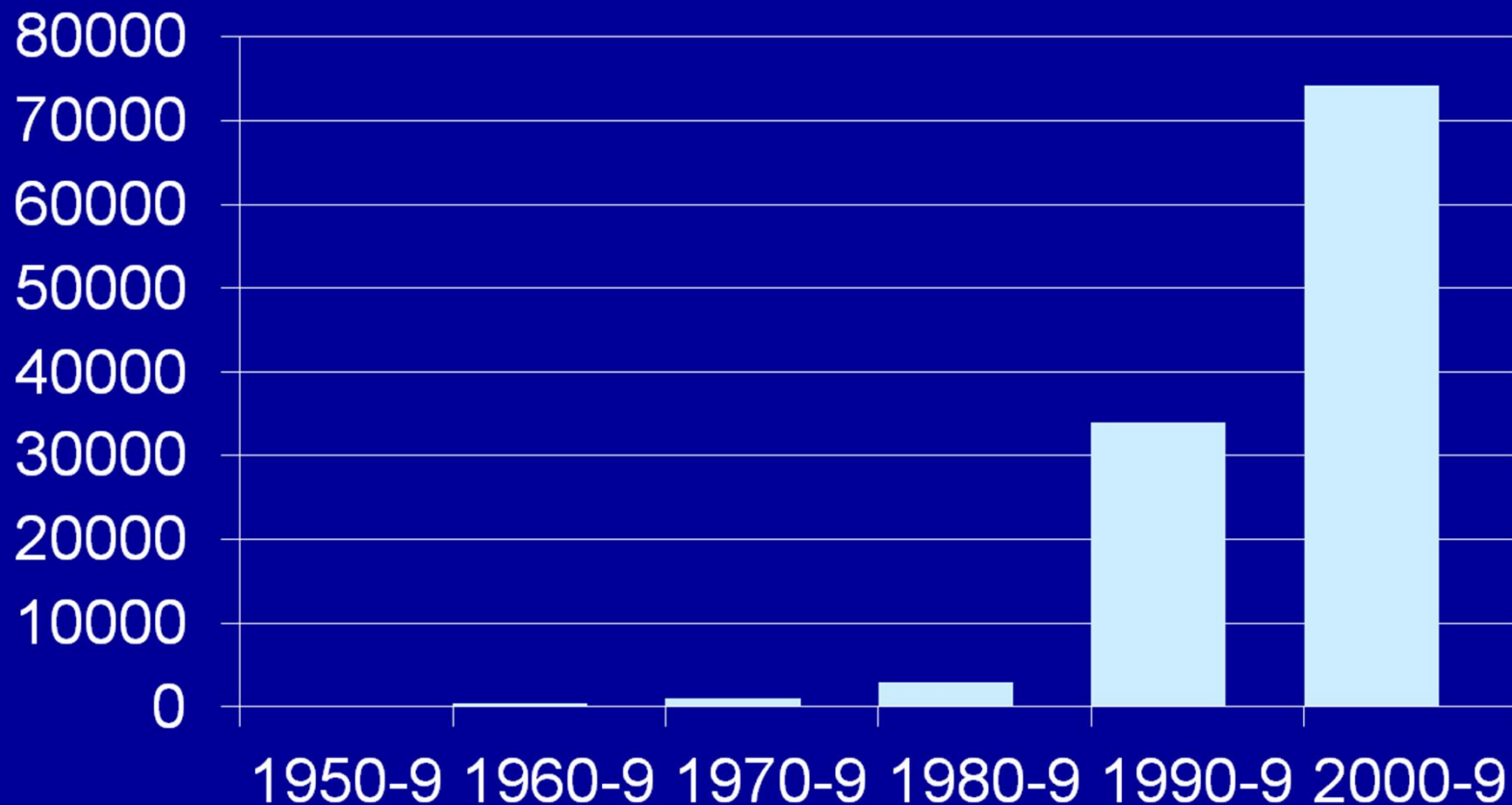
Physical Activity at Work and Coronary Artery Disease, 31,000 London Transport Workers



Morris JN et al. *Lancet* 1953

Articles/Period—Web of Science Physical Activity or Physical Fitness and Cardiovascular Disease

of Articles



Years

The Paradox

- ↑ Focus on healthy eating and physical activity
- ↑ Awareness of dangers of obesity and an unhealthy lifestyle, but...
- Obesity and CVD prevalence continues to rise
 - Work & commuting demands
 - Little time to exercise
 - Little time to prepare food
 - Availability of high-fat/calorie foods

INSIDE IMCLONE • FIGHTING WEST NILE VIRUS

U.S. News & WORLD REPORT

AUGUST 19, 2002

SUPER SIZE AMERICA

HOW OUR WAY
OF LIFE IS
KILLING US

\$3.95



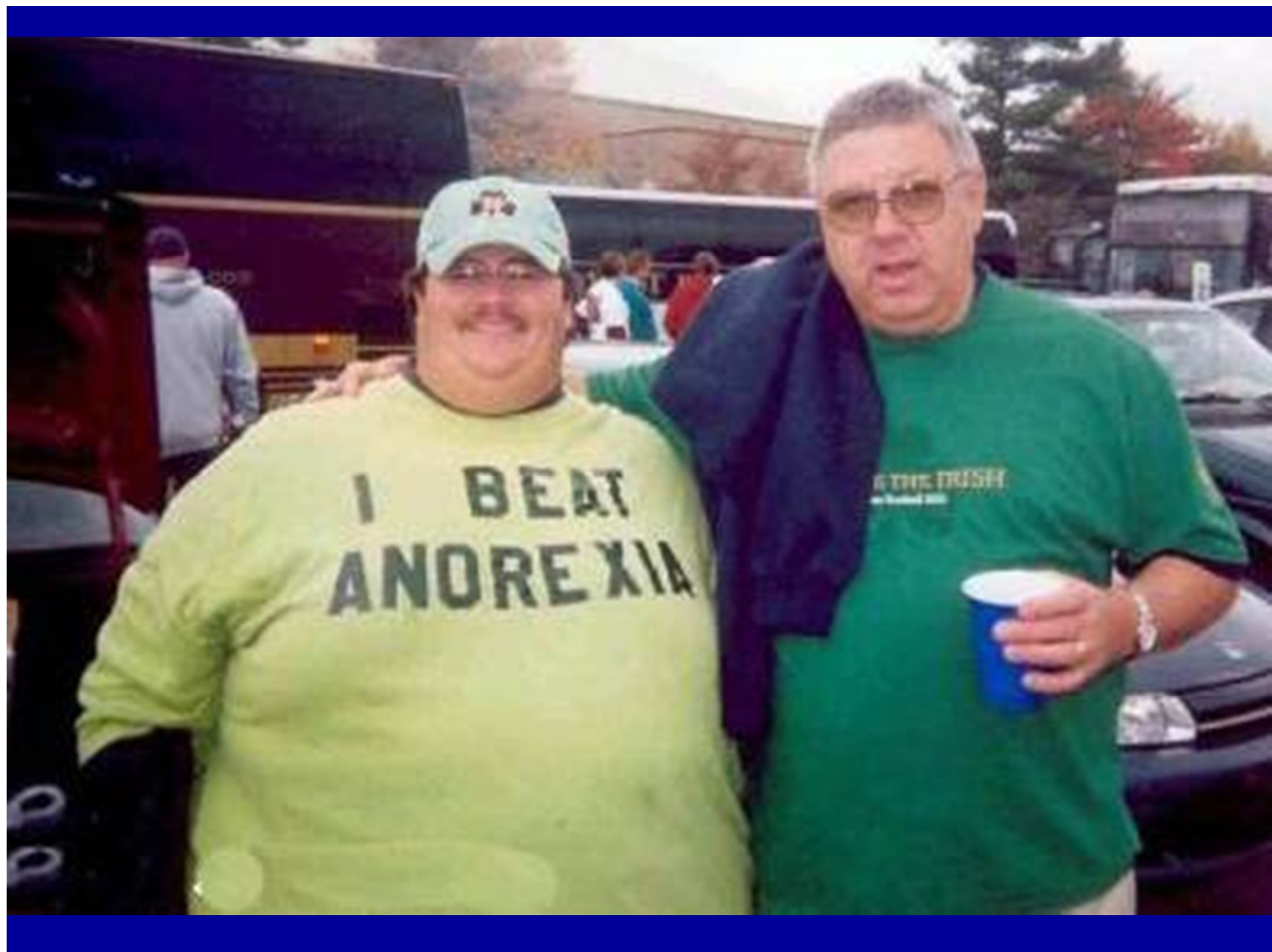
www.usnews.com



Big Texan Steak Ranch Amarillo, Texas

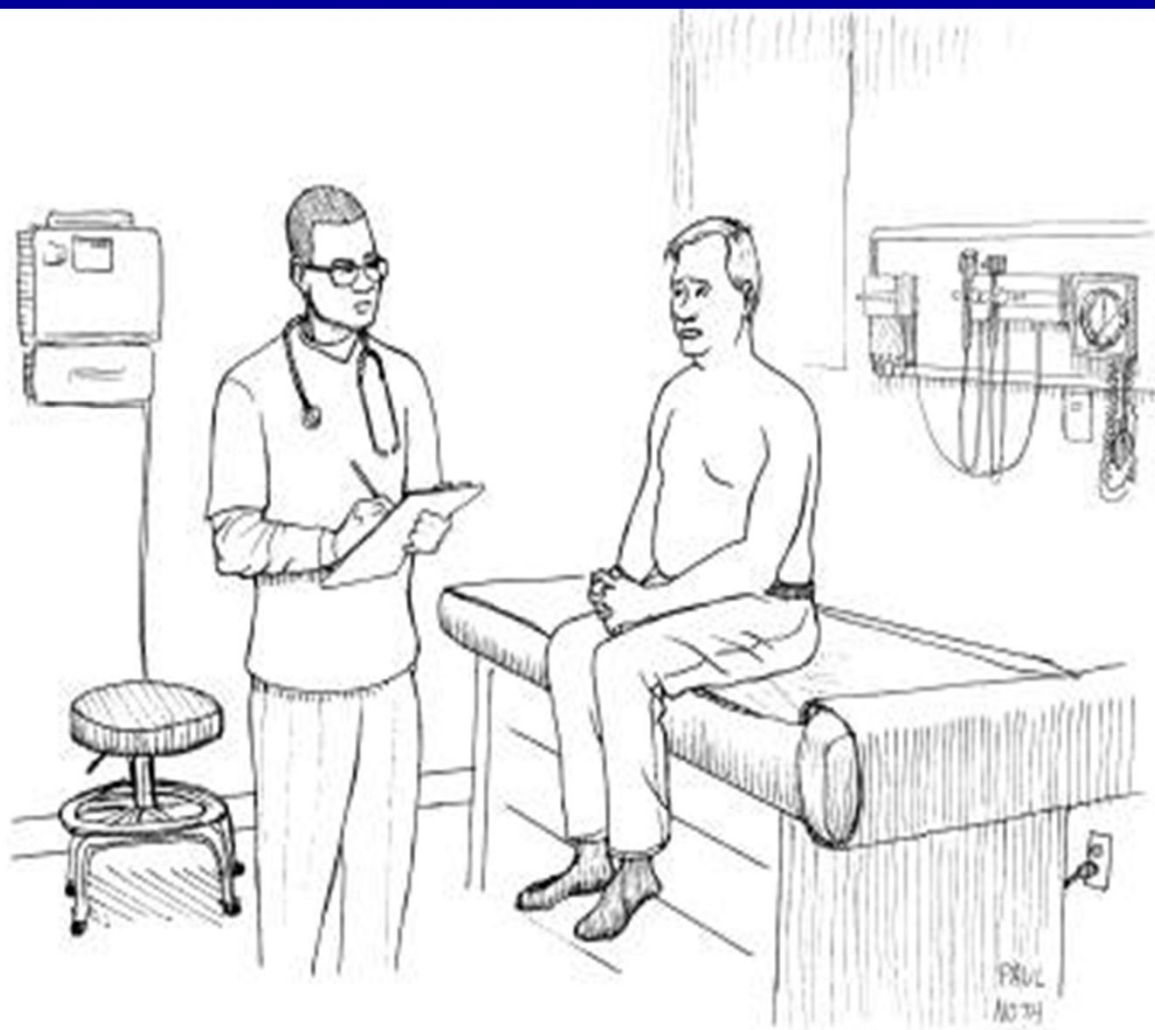


72-oz Steak FREE if eaten within 1 hour









“Will I still be able to not exercise?”

SEPTEMBER 2, 2002

www.time.com AOL Keyword: TIME



The Sopranos: Our Sneak Preview ■ Iraq and al-Qaeda

TIME

WHAT REALLY MAKES YOU FAT?



The latest science
on how your body
handles **CARBS vs. FATS**

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Calorie Balance and Physical Activity

- Scientific evidence does not support “single culprit” theory for driving the obesity epidemic
- The “culprit” is an excess of calories
- There is a need to understand the “calorie equation” and the need for “calorie balance”
- If calories in exceed calories burned off, the excess becomes body fat, & weight goes up

Calorie Balance and Physical Activity

- In studying lifestyles of obese people, scientists have not determined that any specific food or beverage is the root cause of obesity
- All food and beverages along with a habit of physical activity can be a part of a healthy lifestyle
- Achieving calorie balance is the key

Calorie Balance and Physical Activity

Research Indicates:

- The achievement and maintenance of good health depends on the wise management of the energy from all food and beverage sources, along with a habit of regular physical activity
- Balance, variety, and moderation are the keys to achieving calorie balance and a healthy lifestyle

All Calories Count: Comparative Dietary Guidelines

	Carb%	Fat%	Protein %
Mediterranean Diet	45-55	25-35	20
NIH Dietary Ref. Intakes	45-65	25-35	15
Am. Heart Assoc.	40-60	< 30	10-30
NCEP-ATPIII	50-60	25-35	15
Am. Diet Assoc.	45-65	25-35	15
Food Guide Pyramid	60	30	15
<u>NCI, NIA, NIDDK, NHLBI</u>	<u>60</u>	<u>25</u>	<u>15</u>
Atkins Diet	11	56	33
South Beach	36	43	22
Zone Diet	40	30	30

Calorie Balance and Physical Activity: How much is enough for weight loss?

- 2800 kcal/wk (including 800 kcal/wk of high intensity exercise [> 6 METS] e.g. running, aerobic dance)

NWCR, 2014

- 2550 kcal/wk (including 800 kcal/wk of high intensity exercise)

Jeffrey, JCCP, 1998

Calorie Balance and Physical Activity: How much is enough for weight maintenance

- 80 min/day of moderate activity (4 METS)
(e.g. brisk walking, pleasure cycling)
- 35 min/day of intense activity (6 METS)
(e.g. running, aerobic dance)

Schoeller, AJCN, 1997

Calorie Balance and Physical Activity: Strength Training vs. Aerobic Training

- Diet and exercise calories the same
- Strength: 2 set/6 reps + 1 set to max (8 wks)
- Aerobic: 30 min @ 70% HR
- Both groups lost 9 kg (9.2%) in 8 wks
- Strength group lost significantly less lean body mass

Calorie Balance and Physical Activity: Multiple Short Bouts (MSB) vs. One Continuous Bout (CB) of Exercise

- Exercise 5 d/wk, progressed from 20-40 min, 20 wks
- MSB increased adherence (87 d vs. 69 d)
- MSB greater duration (233 vs. 188 min/wk)
- MSB lost 9 kg; CB lost 6 kg
- Cardiovascular benefits were similar

Jakicic, IJO, 1999

Calorie Balance and Physical Activity: Long-Term Weight Maintenance: National Weight Control Registry

- > 3200 members
- Maintained average weight loss of 30 kg for 5.5 yrs
- > 15% have maintained their weight loss > 10 yrs
- Members have lost an average of 10 BMI units from 35 to 25 kg/m²

Hill & Wing, 2014

Calorie Balance and Physical Activity: Long-Term Weight Maintenance

National Weight Control Registry

- Diet: 24% fat, 56% carbohydrate, 20% protein
- Physical Activity: 60-90 min/day moderate intensity (400 kcal/day), mostly walking
- Frequent self-monitoring: daily or weekly weighing, daily food and physical activity records, counting calories or fat grams
- Eating breakfast: 78% ate breakfast every day

Hill & Wing, 2014

Calorie Balance and Physical Activity: Realistic Management Goals

- 5-10% weight loss
- Health, energy and fitness
- Well-being and self-esteem
- Mood and appearance
- Functional and recreational activity

Calorie Balance and Physical Activity: Benefits of Modest Weight Loss

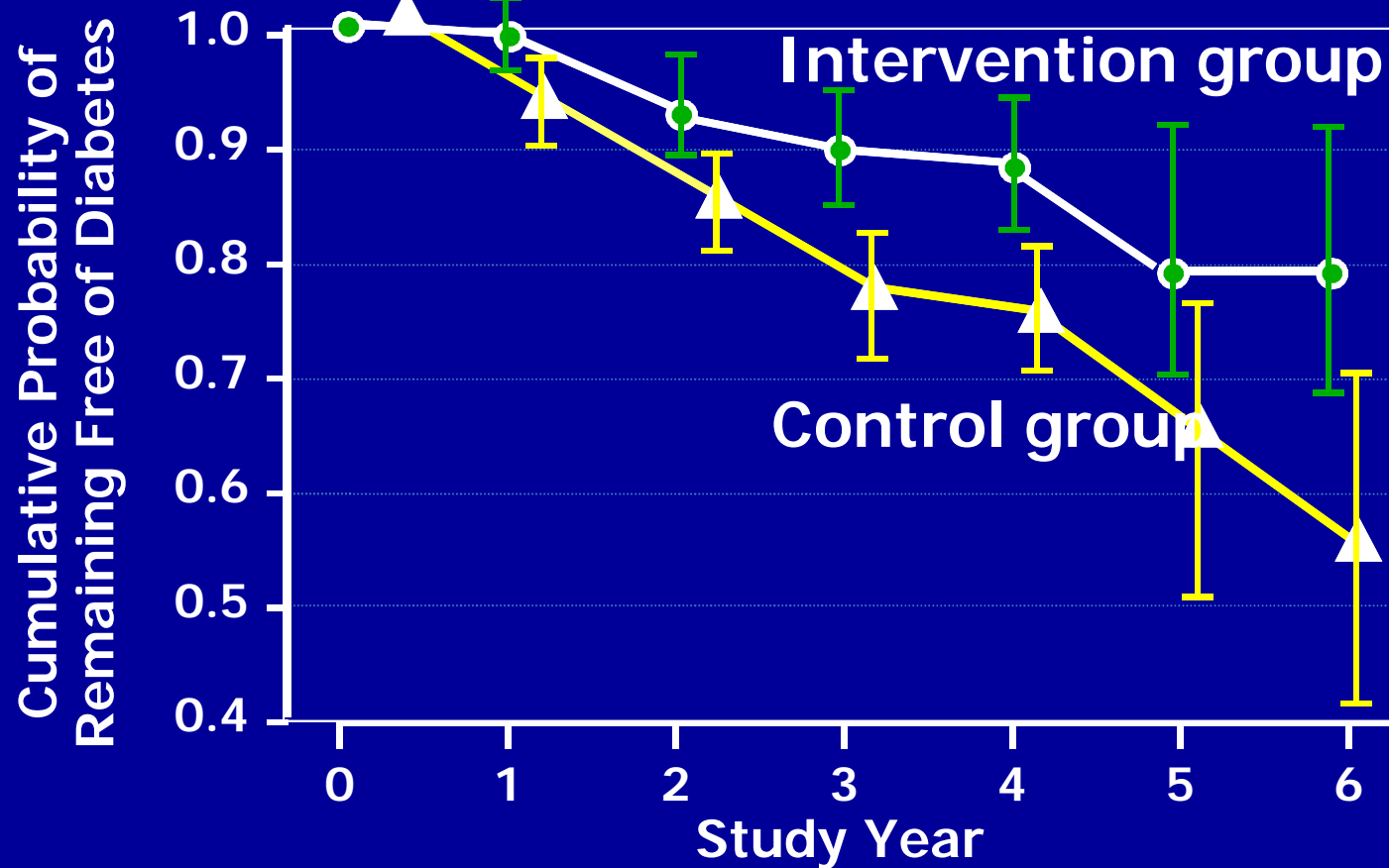
“Several studies demonstrate that small losses...help reduce obesity-related comorbidities and that improvements in these risk factors persist with maintenance of these modest weight losses.”

-Institute of Medicine, 1995

- ↓ Glucose levels
- ↓ Insulin levels
- ↓ HbA1c
- ↓ Triglyceride levels
- ↑ HDL cholesterol levels
- ↓ LDL cholesterol levels
- ↓ Blood pressure
- ↑ Quality of life levels

Finnish Diabetes Prevention Trial

Modest, sustained reduction reduced morbidity



Wt change
 $-4.7 \pm 5.4\%$

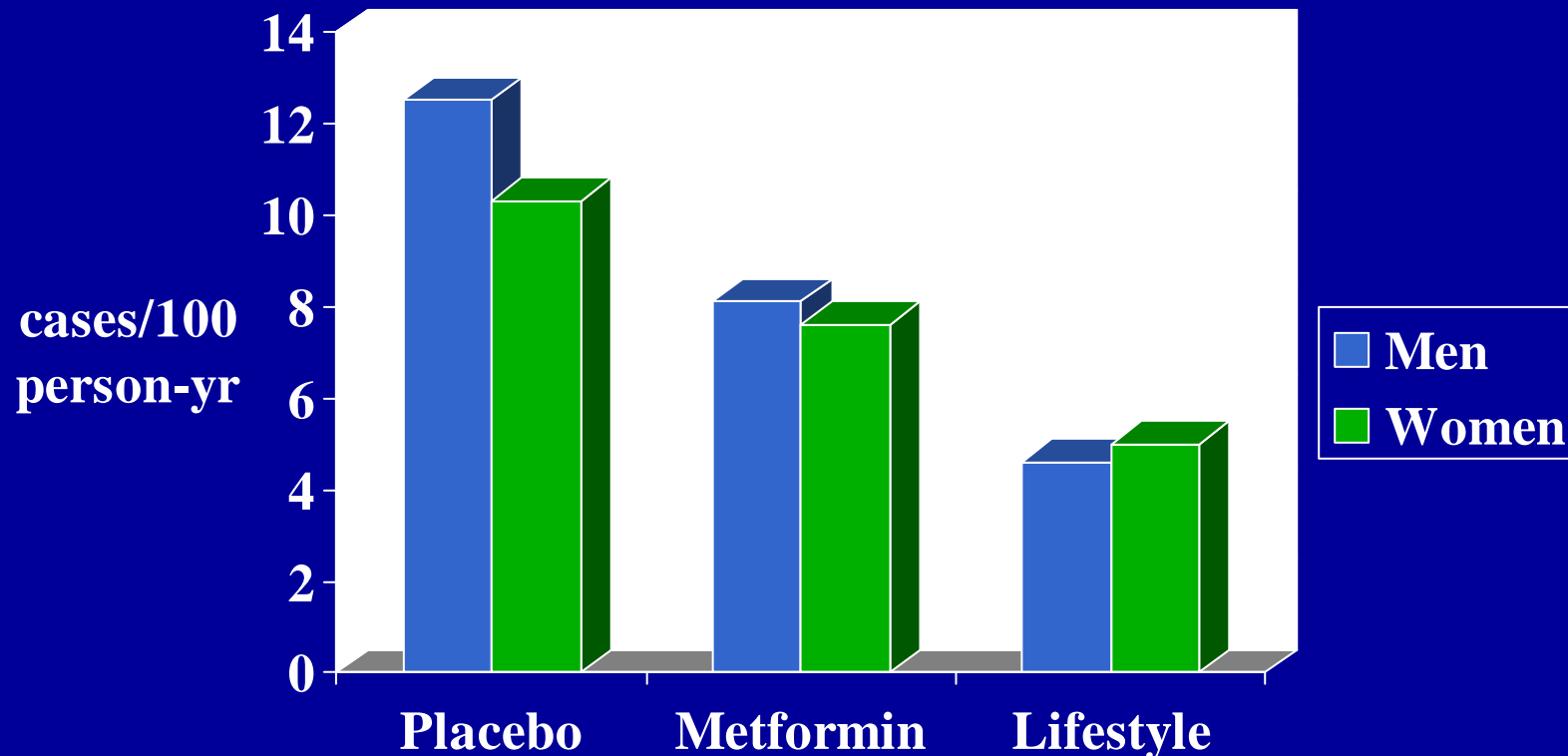
Wt change
 $-0.9 \pm 4.2\%$

Adapted from Tuomilehto J, et al. NEJM 2001; 344: 1343-50

DIABETES PREVENTION PROGRAM

INCIDENCE OF DIABETES

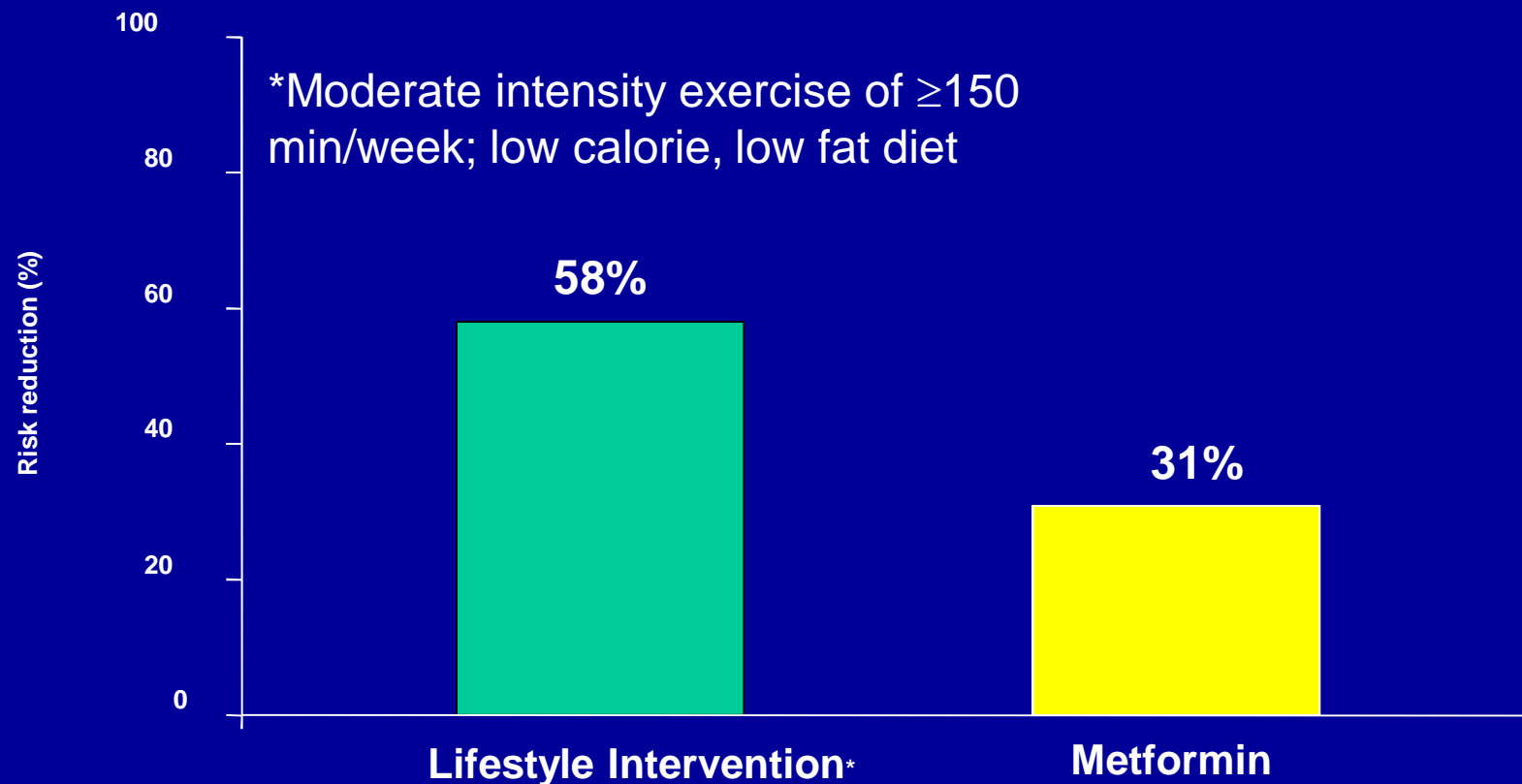
Lifestyle = 7% weight loss, 150 min physical activity/week



Diabetes Prevention Program. NEJM, 2002; 346: 393-

Reduction in Risk of Developing Diabetes in Comparison with Controls

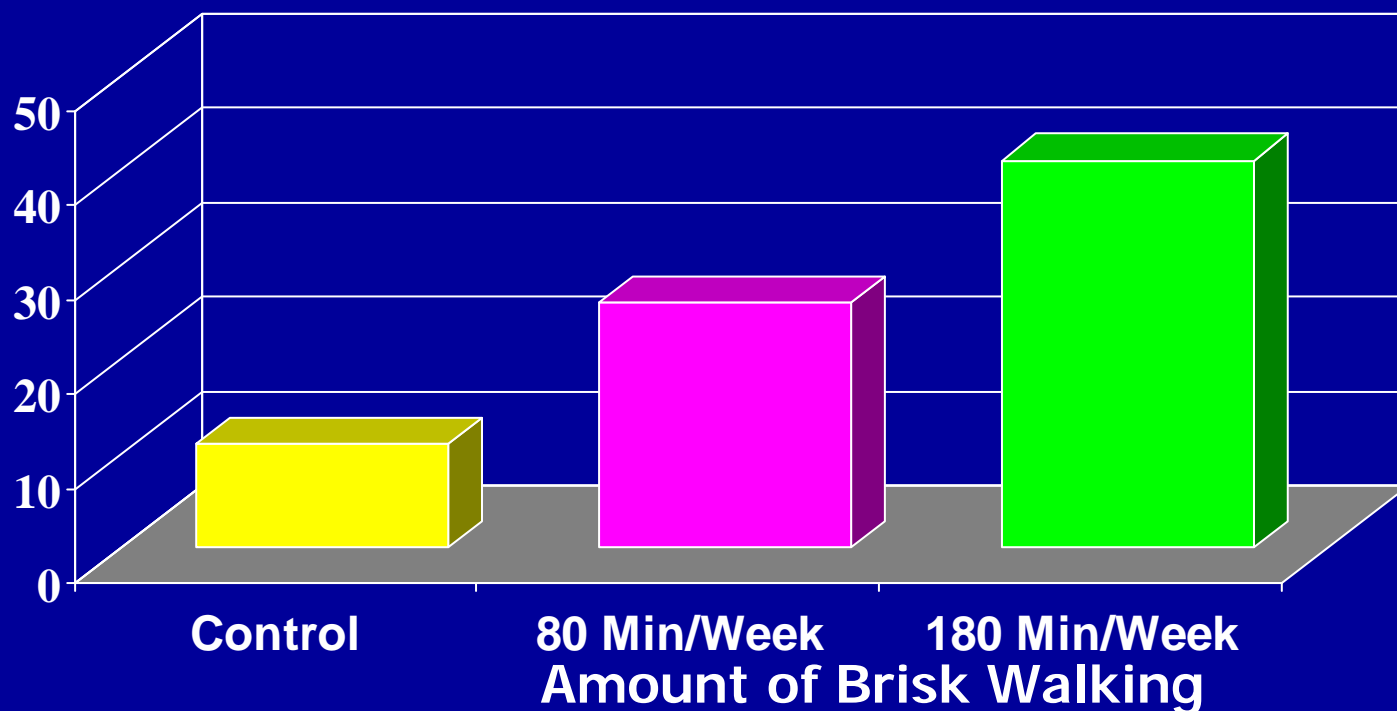
Diabetes Prevention Program



DPP Research Group. *NEJM* 2002; 346:393-403

Physical Activity Is As Good As Other Treatments for Clinical Depression

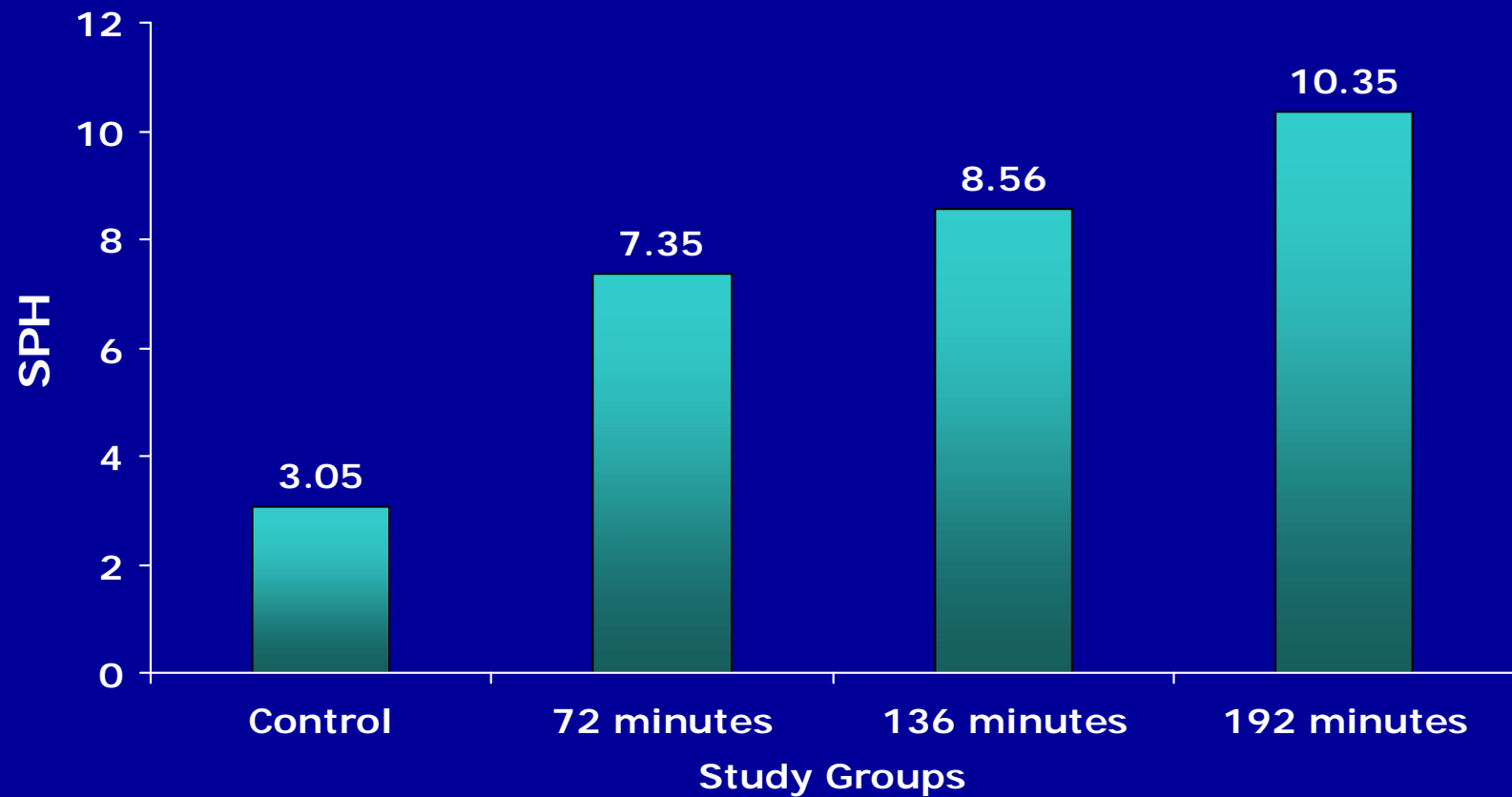
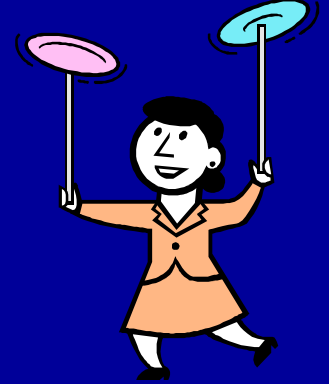
% of Patients with Remission of Depression



Drug therapy and cognitive behavioral therapy produce remission in approximately 40% of clinically depressed individuals

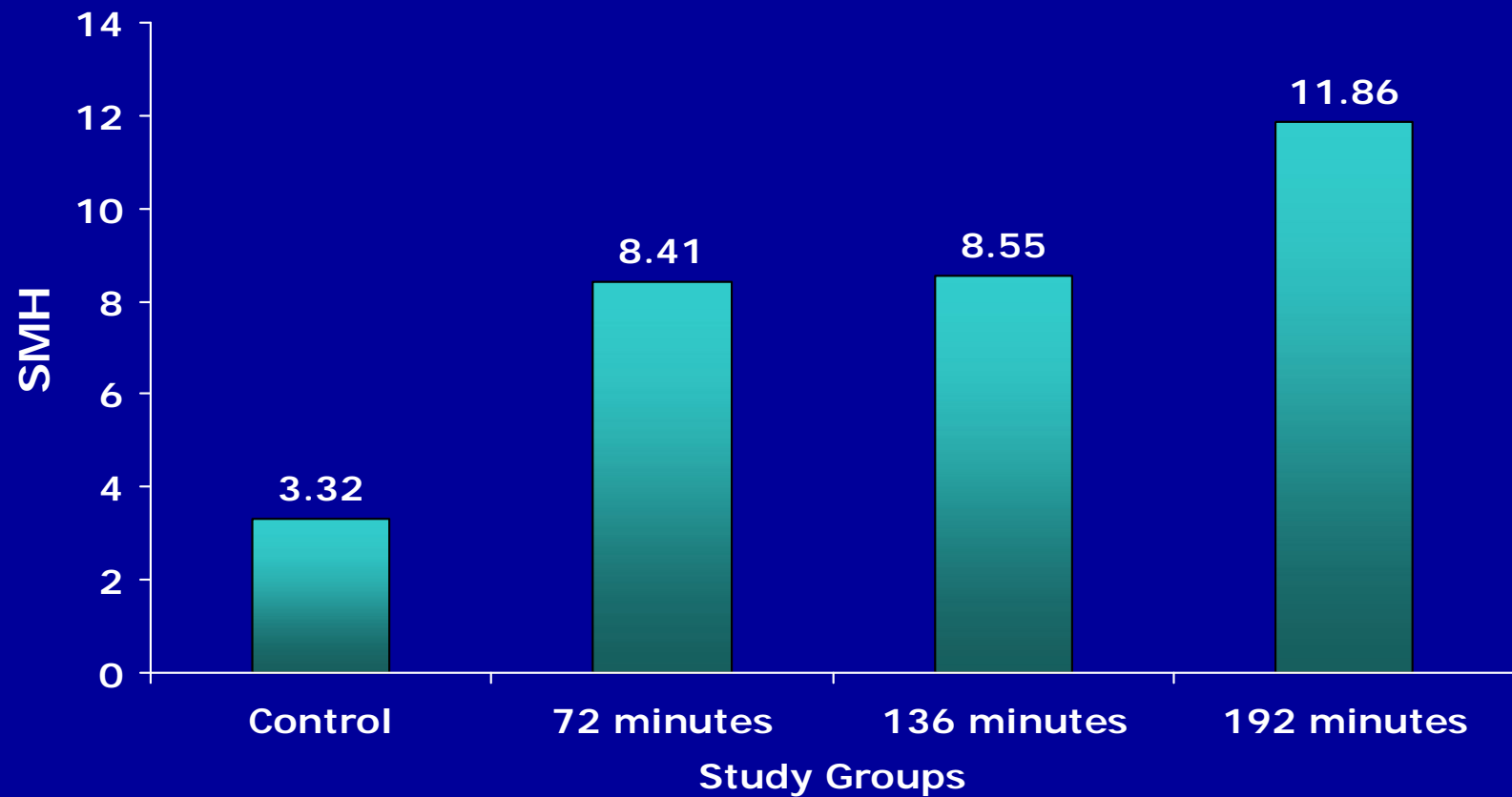
Dunn A et al. *Am J Prev Med* 2005

Change in Physical Health



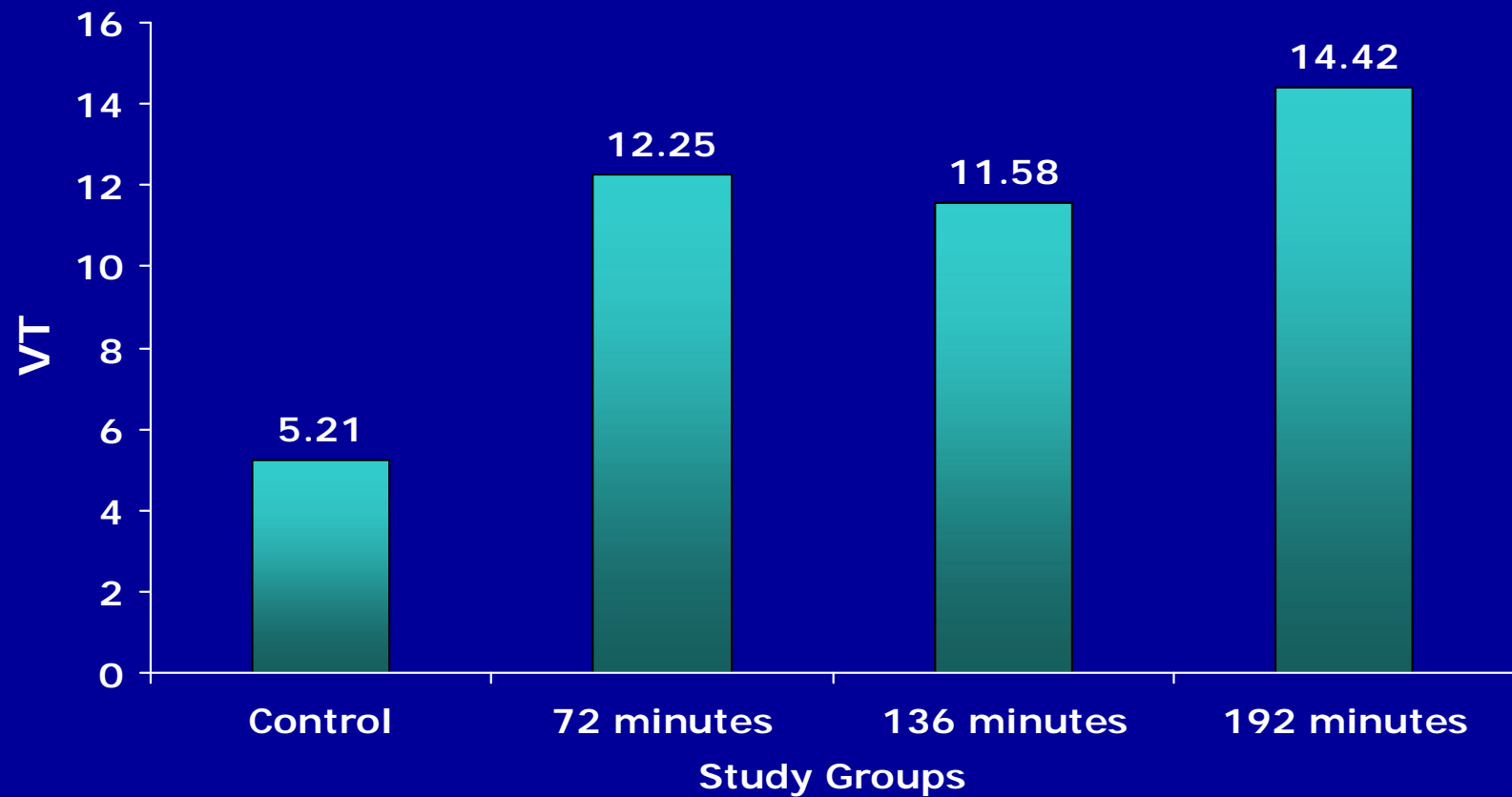
Martin CK et al. *Arch Int Med* 2009; 169:269-78

Change in Mental Health



Martin CK et al. *Arch Int Med* 2009; 169:269-78

Change in Energy



Martin CK et al. *Arch Int Med* 2009; 169:269-78

The Look AHEAD Study

Does Modest Weight Loss Achieved
Through Lifestyle Changes (diet and
physical activity) Reduce Cardiovascular
Disease and Death in Individuals with
Type 2 diabetes?

Look AHEAD

Primary End Point Composite

- Cardiovascular death (including fatal myocardial infarction and stroke)
- Non-fatal myocardial infarction
- Non-fatal stroke

Look AHEAD

Study Population

N=5145

- Type 2 diabetes
 - Any treatment
 - $< 30\%$ on insulin
- Overweight
 - BMI ≥ 25 and ≥ 27 if on insulin

Look AHEAD

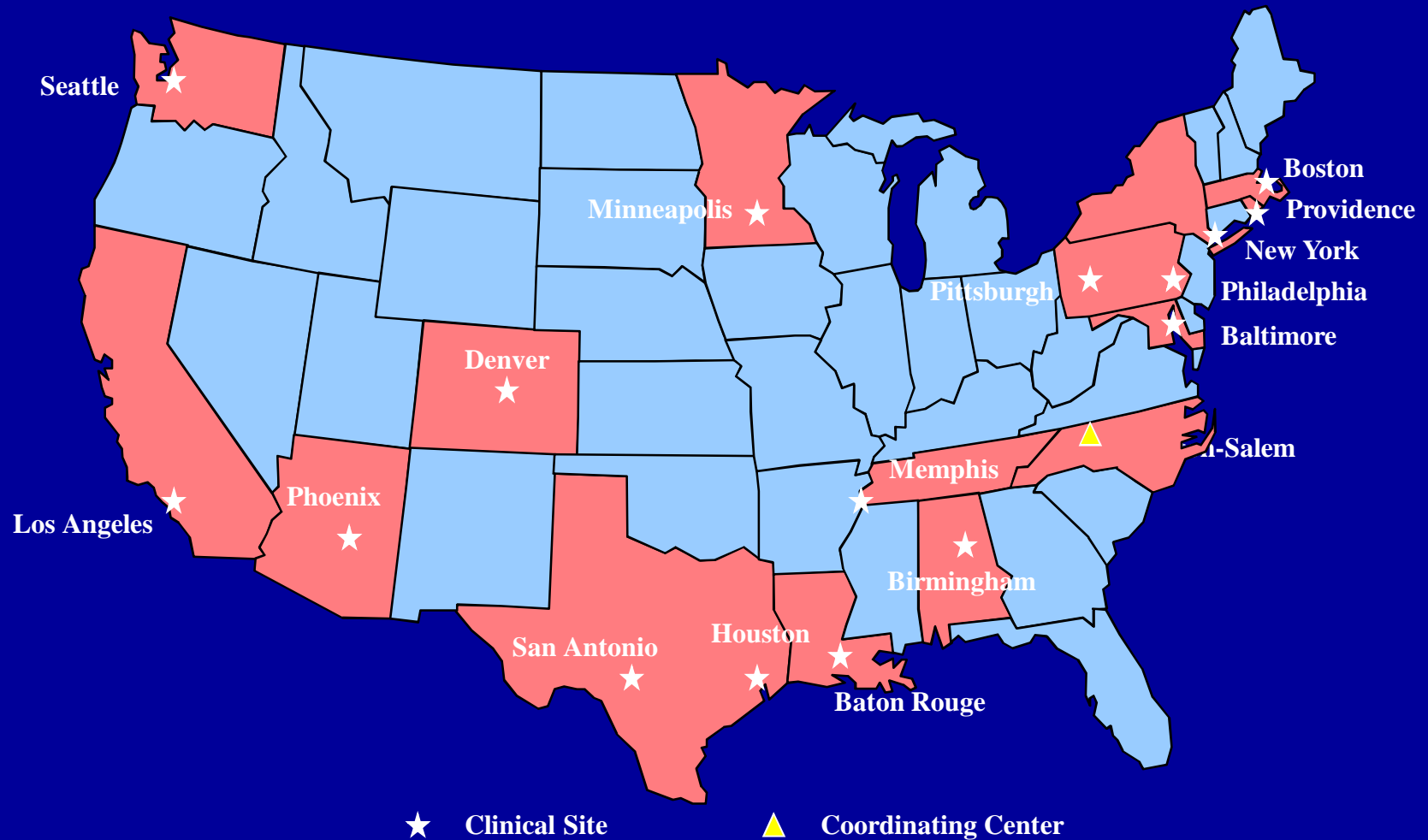
Participants

	Lifestyle	DSE
	(N=2630)	(N=2574)
Women	59%	60%
Minority	37%	37%
Age (years)	58.6	58.9
Insulin Users	14%	15%
Baseline BMI	35.9	36.0
Baseline weight (kg)	100	101
Attended 1 year exam	96%	94%*

* $p \leq .0004$

Look AHEAD

Clinical Sites



Look AHEAD

Study Interventions

- Diabetes support and education - DSE (control group)
- Lifestyle intervention – ILI (treatment group)

Look AHEAD

Diabetes Support and Education (Control Group)

- 3 group educational/social support sessions/year for 4.0 years, then 2 group sessions/year for remainder of the study
- 1 session on diet and nutrition, 1 session on exercise, 1 support session

Look AHEAD

Lifestyle Intervention Group

Goals:

- 7% weight loss for the group (10% for individual)
- 175 minutes of moderate intensity activity (35 min/day/5 days/week)

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Lifestyle Intervention Group

- Diet
 - ADA, NCEP (< 30% fat, < 10% sat fat, >15% protein)
 - 1200-1500 (if weight <250lbs)
 - 1500-1800 (if weight >250lbs)
 - During first 4 weeks to 4 months, portion control (liquid meal replacements or structured meal plan)

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Lifestyle Intervention Group

- Physical Activity
 - unsupervised
 - 175 minutes moderate intensity/week
 - 35 minutes, 5 days/week
 - walking

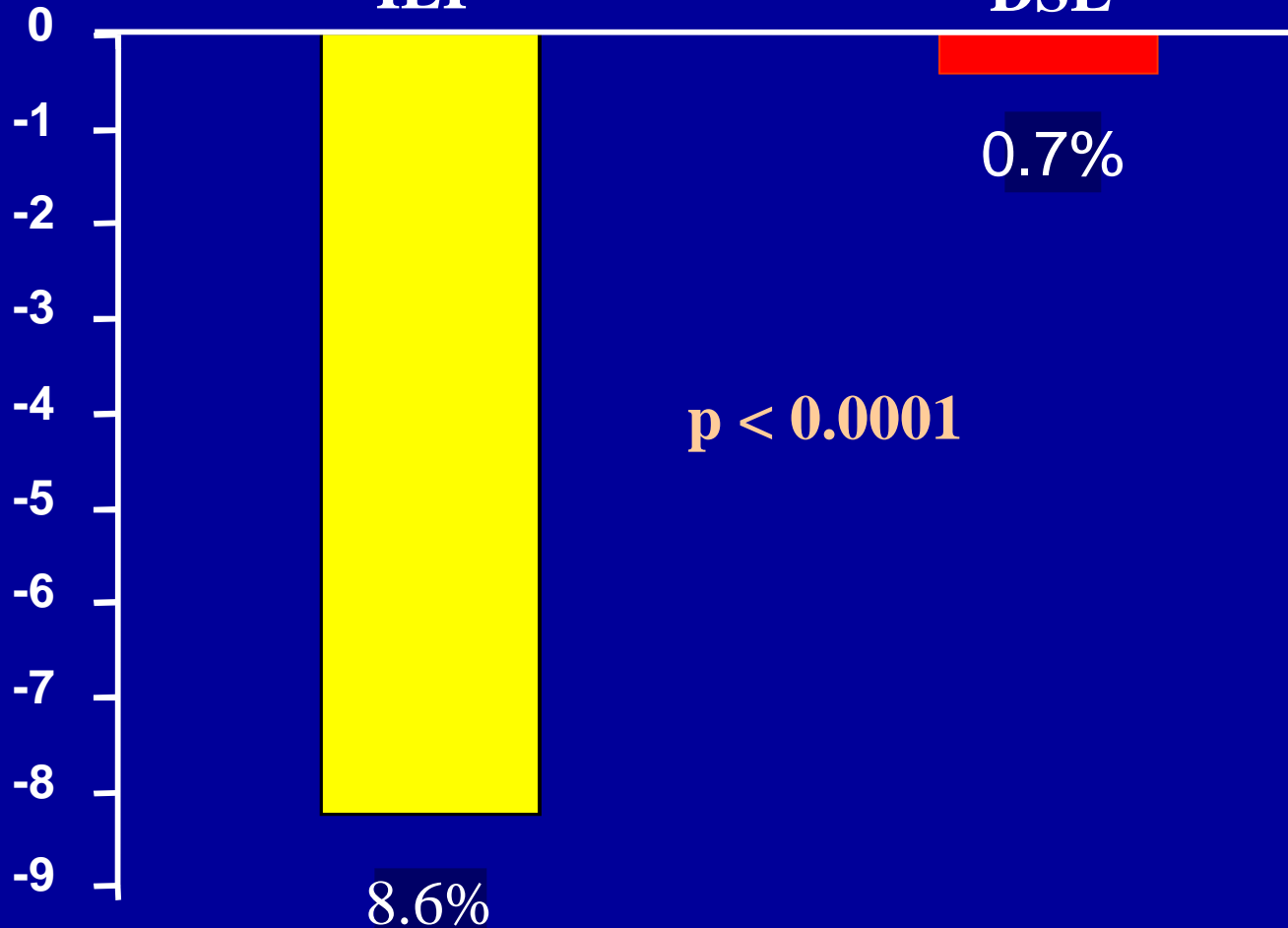
Look AHEAD

% Weight Loss at 1-Year

ILI

DSE

% Weight Change



$p < 0.0001$

The Look AHEAD Research Group, Diabetes Care, 2007

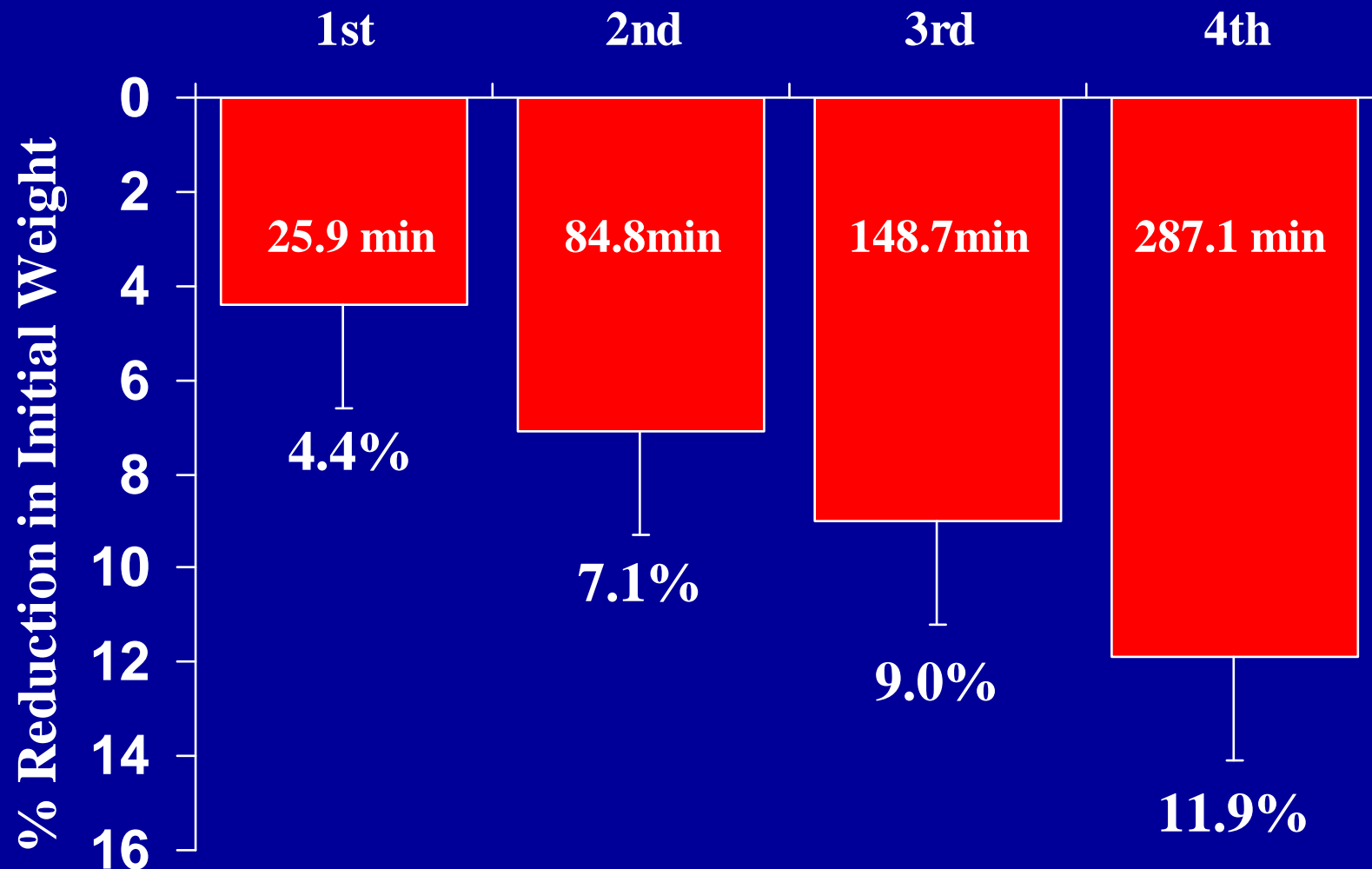
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Weight Loss Success Factors

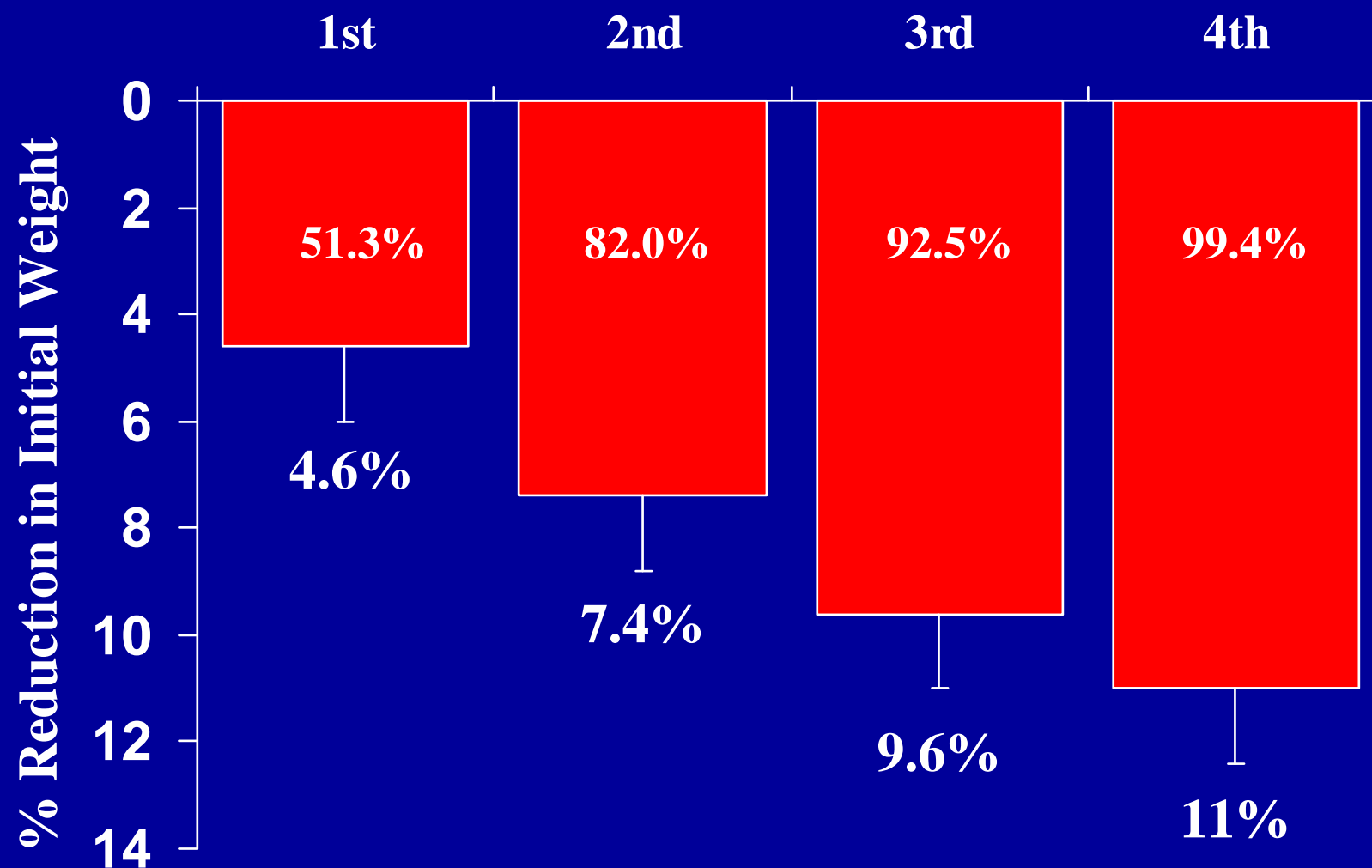
At one year, the three significant weight loss success factors were:

- Self-reported physical activity (mean=137 minutes/wk)
- Treatment attendance (mean=35 sessions/yr)
- Meal replacements (mean=361/yr)

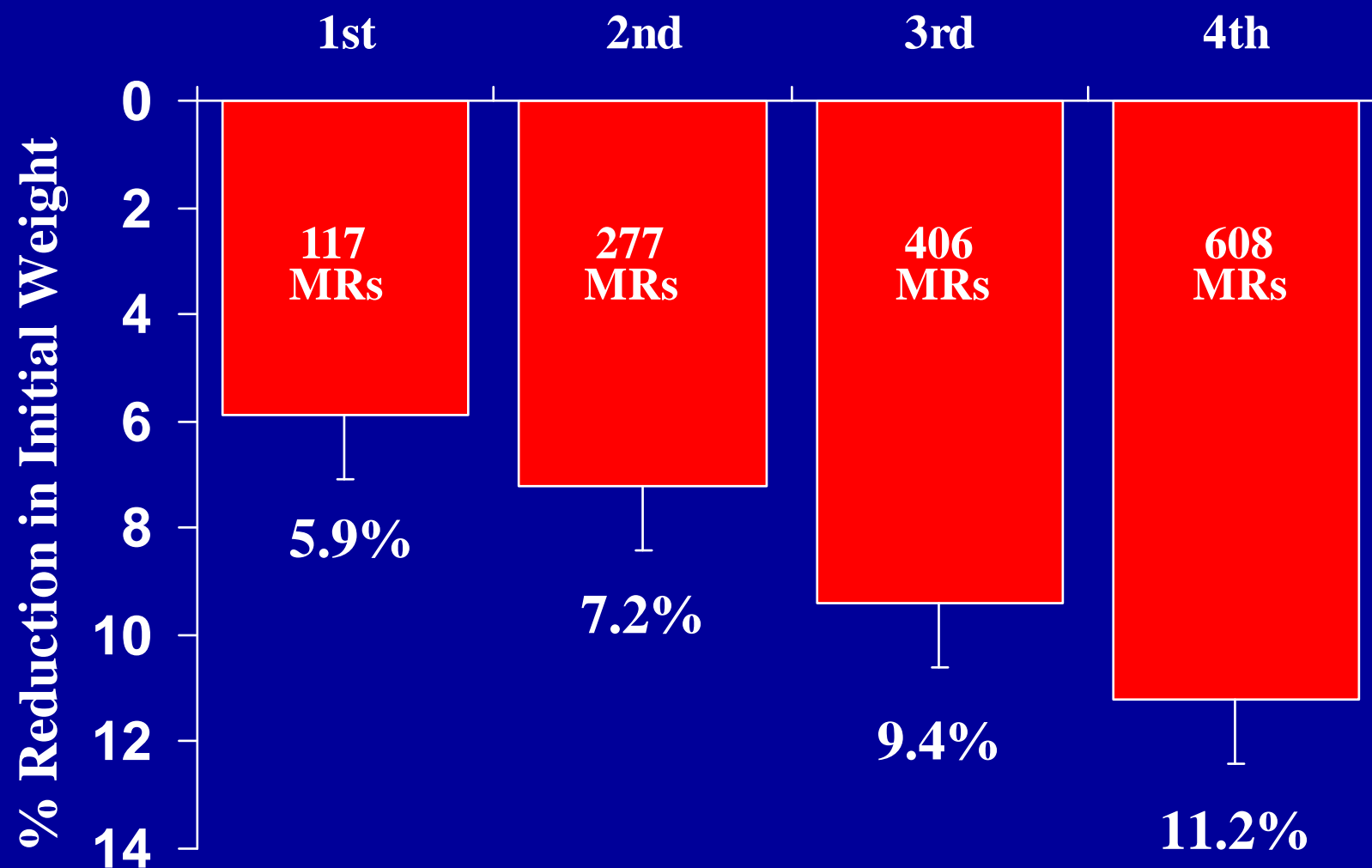
1-Yr Weight Loss (ILI) Based on Quartiles of Weekly Physical Activity



1-Yr Weight Loss (ILI) Based on Quartiles of % of Visits Attended

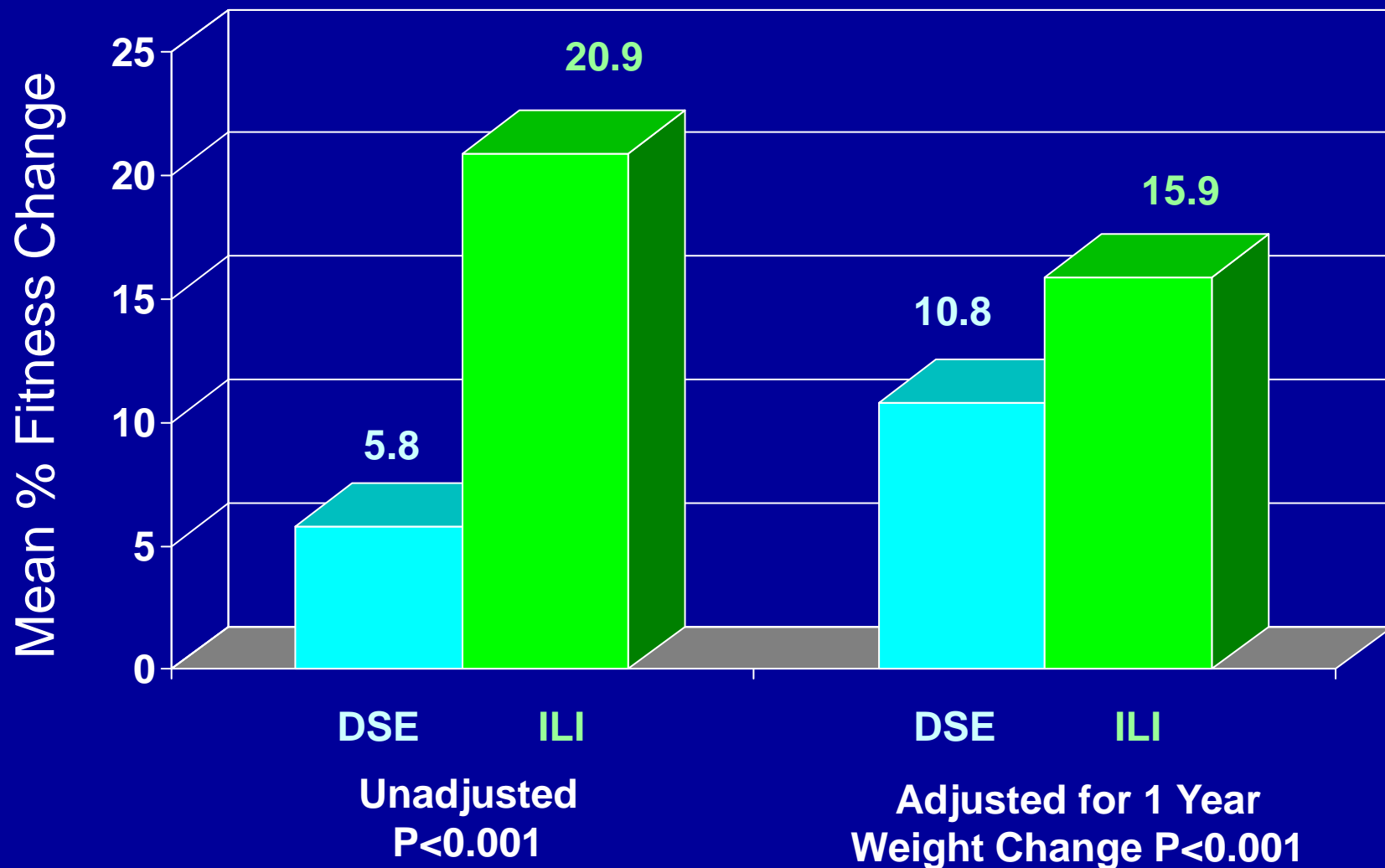


1-Year Weight Loss (ILI) Based on Quartiles of Meal Replacements (MR) Used



Look AHEAD

Fitness Change (%) at 1-Year



The Look AHEAD Research Group, Diabetes Care, 2007

Look AHEAD

Quality of Life

At one year:

- Improved Quality of Life in Lifestyle vs. Control ($p < 0.001$)
- Largest effect size was in SF-36 physical component score

Look AHEAD

Perspective

- Significant weight losses are achievable in patients with diabetes (-8.6% at one year; -4.66% at four years)
- Significant weight losses are achievable in patients on insulin (-7.6% at one year)
- Weight loss success factors include: physical activity, attendance, and meal replacements

Achieving Calorie Balance

Summary

Physical Activity:

- promotes health regardless of weight loss
- helps minimize loss of lean body mass
- Builds fitness capacity
- Contributes to abdominal fat mobilization
- Enhances psychological well-being
- Is the best predictor of weight loss maintenance

Achieving Calorie Balance

Summary

- There are many ways to become less sedentary, more physically active, and achieve and maintain energy balance
- The lifestyle approach (walking daily) is a good place to start
- Aerobic and strength training also helpful for calorie balance and reduced CV risk
- There are many tools available (pedometers, apps, etc.) to help motivate individuals to achieve calorie balance

Secrets For Achieving a Healthy Lifestyle and Maintaining Calorie Balance

Every Day:

- Sleep 8 hours
- Eat breakfast
- Walk briskly 60 minutes
- Write down what you eat & look up the calories
- Weigh
- Find support
- Never give up

NATURE VS. NURTURE

“The Current Epidemics of Chronic Diseases
are a Result of Discordance Between Our
Ancient Genes and Modern Lifestyle.”

Eaton et al., *The Paleolithic Prescription*. 1988.

NATURE VS. NURTURE

“Accuse not nature.
She has done her part.
Do Thou but Thine.”

John Milton (1687), *Paradise Lost*

LIVING

COUCH POTATOES, ARISE!



Thank You