

## Type 2 Diabetes Prevention: Lifestyle Change and Coverage Considerations

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### *Helping People Make Lifestyle Changes that Stick*

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## Outline

- Detail findings from Look AHEAD\* and POUNDS LOST\*\* studies
- I.D. factors for successful weight loss
- I.D. factors for successful weight maintenance post weight loss

\*Look AHEAD: Action for Health in Diabetes  
\*\*POUNDS LOST: Preventing Overweight Using Novel Dietary Strategies

### Detail findings from Look AHEAD and POUNDS LOST studies

## Look AHEAD Trial



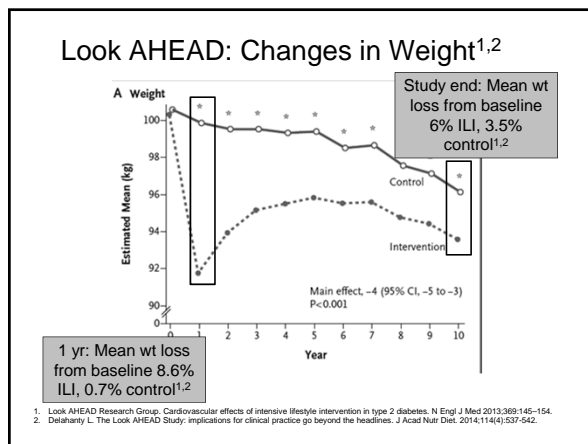
- Study details:
  - Long term (start ~2000), multicenter, RCT, ended early 2012<sup>1,2</sup>
  - > 5,137 (55-76 yrs), overweight or obese individuals<sup>2</sup>
  - T2 diabetes for 6.8 ± 6.5 yrs (range 3 mos – 13 yrs)<sup>3</sup>
  - Median follow up 9.6 yrs<sup>4</sup>
- Primary Outcome:
  - Will intentional weight loss reduce the incidence of fatal and nonfatal cardiovascular and cerebrovascular events?

1. <http://www.nih.gov/news/health/oct2012/middk-19.htm>  
2. Look AHEAD Research Group. Reduction in weight and cardiovascular disease risk factors in individuals with type 2 diabetes. *Diabetes Care*. 2007;30(6):1374-1383  
3. Bertoni, et al. *Journal of Diabetes and its Complications*. 2008;22(1-9).  
4. Look AHEAD Research Group. Cardiovascular effects of intensive lifestyle intervention in type 2 diabetes. *N Engl J Med* 2013;369:145-154.

## Look AHEAD Trial – Groups Defined

- Intensive Lifestyle Intervention (ILI)<sup>1,2</sup>
  - 7% > wt loss at one year
  - >175 minutes physical activity/week
  - Calorie goal: 1200-1800 cal/day, ≤ 30% of cal as fat
  - Support: significant, especially early
- Diabetes Support and Education (DSE)/(control)

1. Look AHEAD Research Group. Reduction in weight and cardiovascular disease risk factors in individuals with type 2 diabetes. *Diabetes Care*. 2007;30(6):1374-1383  
2. Look AHEAD Research Group. Cardiovascular effects of intensive lifestyle intervention in type 2 diabetes. *N Engl J Med* 2013;369:145-154.



### Look AHEAD – Positive Results, Despite Headlines<sup>1,2,3</sup>

- Median follow up 9.6 yrs<sup>1</sup>
- Mean wt loss from baseline 6% ILI, 3.5% control<sup>1</sup>
- A1c lowering ILI group 0.2%<sup>1</sup>
- **Primary outcome: Failed to reduce CVD events in ILI vs. control**
- Other health benefits:
  - Reduced sleep apnea, depression, urinary incontinence and improved QOL<sup>3</sup>
- Subjects with early T2D = most health benefits
  - Shortest duration
  - Not on insulin
  - Good baseline glycemic control

1. Look AHEAD Research Group. Cardiovascular effects of intensive lifestyle intervention in type 2 diabetes. N Engl J Med 2013;369:145–154.  
 2. Delahanty L. The Look AHEAD Study: implications for clinical practice go beyond the headlines. J Acad Nutr Diet. 2014;114(4):537-542.  
 3. Westlaw HS. The Look AHEAD Trial: Look beyond the headlines. Wt Mgmt Matters/WMDPM. 2014;12(4):2-3. Diab. Care and Endocrine Newflash. 2014;35(3):9-11.

### Look AHEAD: Benefits of Weight Loss on CVD<sup>1</sup>

- ILI who lost >10% of BW
  - 20% lower risk of the primary outcome\*
  - 21% lower risk of secondary outcome\*\*
- Change in fitness was not significantly associated with a change in the primary outcome\*
- Key factor = amount of weight loss

\*Primary outcome: composite of death from CV causes (non-fatal acute MI, non-fatal stroke, or hospital admission for angina)  
 \*\*Secondary outcome: primary plus hx of CABG, carotid endarterectomy, percutaneous coronary intervention, hospitalization for CHF, peripheral vascular disease, or total mortality (death)

1. Gregg EW. Association of the magnitude of weight loss and changes in physical fitness with long-term cardiovascular disease outcomes in overweight or obese people with type 2 diabetes: a post-hoc analysis of the Look AHEAD randomised clinical trial. Lancet Diabetes Endocrinol. 2016 Nov;4(11):913-921

### Look AHEAD – Positive Results, Despite Headlines<sup>1,2</sup>

- Financial analysis<sup>2</sup>:
  - ILI produced mean relative per-person 10-year healthcare cost savings of \$5,280; not evident in ppl w/ hx of CVD
  - Average annual savings ~\$600/participant
  - ILI used fewer medications (7%)
  - ILI had fewer hospitalizations (11%)
- Look AHEAD continues as observational trial until 1/2021<sup>3</sup>

1. Look AHEAD Research Group. Cardiovascular effects of intensive lifestyle intervention in type 2 diabetes. N Engl J Med 2013;369:145–154.  
 2. Espeland MA, et al. Impact of an intensive lifestyle intervention on use and cost of medical services among overweight and obese adults with T2D: (Look AHEAD). Diabetes Care. 2014;37:2549–2556.  
 3. Look AHEAD: <https://clinicaltrials.gov/ct2/show/NCT00179513>

### POUNDS LOST Study<sup>1</sup>

Study details:

- NIH - 2 yr wt loss trial, 800+ subjects, 2 sites
- Overwt adults, BMI: 25 - 40
- 4 diets, varying % calories:
  - CHO - Low 35% to high of 65%

1. Sacks, F, et al. Comparison of Weight-Loss Diets with Different Compositions of Fat, Protein, and Carbohydrates. New Eng J Med. 2009;360(9):859-873.  
 \*Preventing Overweight Using Novel Dietary Strategies

### POUNDS LOST Study<sup>1</sup>

Results:

- No one nutrient composition fared better than another (subjects modified towards diet goal, but didn't reach diet's goal)
- Weight loss:
  - 6 months: similar weight loss - 7% (6 kg/13 lbs)
  - 12 months: regained similar amounts of weight
  - 2 years weight loss remained similar: 4 kg/9 lbs
  - Subjects attending 2/3rd of sessions lost: 9 kg/20 lbs
- Clinical improvements:
  - Reduced cardiovascular disease and type 2 diabetes risk factors including lower LDL-cholesterol, BG and serum insulin levels; and slightly lower BP

1. Sacks, F, et al. Comparison of Weight-Loss Diets with Different Compositions of Fat, Protein, and Carbohydrates. New Eng J Med. 2009;360(9):859-873.

### Natural History: Wt Gain, Loss, Regain<sup>1</sup>

1. Eckel RH et al: Obesity and type 2 diabetes: What can be unified and what needs to be individualized? Diabetes Care 34:1424-1430, 2011

### Weight Loss Matters Most – When?<sup>1</sup>

The graph, titled "Natural History of Type 2 Diabetes", plots Glucose (mg/dL) and Relative Insulin Resistance on the y-axis against Years on the x-axis. The x-axis ranges from -15 to 30 years. Key points on the timeline include:
 

- 15 years: Pre-diabetes and/or Insulin Resistance Syndrome
- 5 years: Diabetes diagnosis
- 0 years: Fasting glucose and Post-meal glucose levels are shown.
- 10, 20, 25, 30 years: Insulin resistance and Insulin level are shown.

 An arrow points from the text "But Healthy Eating is continuously important and can always assist glucose, BP, lipid control!" to the graph's timeline.

**But Healthy Eating is continuously important and can always assist glucose, BP, lipid control!**

American Diabetes Association (ADA). Standards of Medical Care – 2016. Diabetes Care. 2016;39(suppl 1).  
 1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4710108/>  
 recommendations for the management of adults with diabetes. Diabetes Care. 2013;36(11):3821-3842.

### Words of Wisdom and Sanity from Experts: Arya Sharma, MD

- Obesity/overweight a chronic, progressive condition
- Early, aggressive management is critical
- It's not a treat it, you're done condition
- Our goal should NOT be to help people get thinner, but to help people get healthier. Take the attention off of weight.
- "I only care about the weight you can keep off."

AADE 2013, <http://www.presentdiabetes.com/eazines/#azine413>.  
 Chair in Obesity Research and Management at the University of Alberta in Edmonton and Director of the Alberta Health Services Obesity Program. <http://www.drsharma.ca/>, Twitter: @drsharma.  
<http://www.drsharma.ca/>

### 15 Dietary Approaches Associated with Weight Loss by Expert Panel<sup>1</sup>

Among 15, range of options:\*

- Higher protein (25%), fat (30%), carbohydrate (45%)
- Lacto-ovo-vegetarian-style
- Low-fat (10% to 25% of total calories from fat) vegan-style
- Low-carbohydrate (initially <20 g/day carbohydrate)
- Mediterranean-style diet with prescribed energy restriction

\*if reduction in dietary energy intake is achieved.

1. Jensen MD, et al. Guideline for the Management of Overweight and Obesity in Adults: A Report of the ACC, AHA, TOS Task Force on Practice Guidelines. Circulation. <https://circ.ahajournals.org/content/early/2013/11/11/01.cir.0000437739.71477.ee.full.pdf+html?fd=6af28578-67b4-4bb1-9a4d-91eb8818a298> (published in 3 association journals)

**BEST DIETS**  
 US News

**There Isn't Just ONE,  
 But there IS common ground!**

**Best is healthy eating plan a person can follow forever!**

Oldways 2015: <https://oldwayspt.org/programs/oldways-common-ground/oldways-common-ground-consensus>

### Words of Wisdom and Sanity from Experts: David Katz, MD

- (On DIETFITS 2/23) "A shift to wholesome foods in sensible combinations is effective at lowering weight and improving health regardless of fat or carbohydrate levels, even among those with insulin resistance at the start...study suggests best way to lose weight and improve health...is not by fixating on macronutrients or calories, but by eating wholesome foods... emphasizing whole, minimally processed plant foods."<sup>1</sup>
- (On LA Times Taube, Teicholz editorial low carb, high sat fat 2/2) "On what planet did the American public ever try these diets [Dietary Guidelines]? Clearly, not this one. A high quality, traditional Mediterranean diet, the DASH diet - all others that ranked well on the [U.S. News] Best Diets are more alike than different...Emphasis on whole, minimally processed vegetables, fruits, whole grains, beans, lentils, nuts, and seeds-with or without lesser amounts of minimally processed dairy products, lean meats, eggs, fish, and seafood."<sup>2</sup>

1. <https://www.linkedin.com/pulse/horse-sense-weight-loss-david-katz-md-mph-facpm-facp-facim/>  
 2. <https://www.linkedin.com/pulse/diet-obesity-myth-mystery-david-katz-md-mph-facpm-facp-facim/?trk=mp-reader-card>

**Identify factors for successful weight loss, maintenance from recent evidence**

## National Weight Control Registry (NWCR) - 10 years<sup>1</sup>

- Initiated 1993, Wing and Hill
- Goal: ID successful wt loss maintainers and describe their strategies
- Criteria:  $\geq 30$ lbs maintained  $\geq 1$  yr; now  $> 10,000$
- 10 yr study: enrolled 1993 – 2000
- Total: 2886 completed  $> 2$  of 10 annual f/u surveys

1. Graham Thomas J et al: Weight-loss maintenance for 10 yrs in NWCR. Am J Prev Med. 2014;46(1):17-23.

## NWCR - 10 years Predictors of Success<sup>1</sup>

- Magnitude of initial wt loss and duration
- Increased physical activity
- Low calorie and low fat intake
- High restraint and low disinhibition around food
- Self-weighing  $>$  several times/wk

“Continued adherence to each behavior can improve long term outcomes.”

1. Graham Thomas J et al: Weight-loss maintenance for 10 yrs in NWCR. Am J Prev Med. 2014;46(1):17-23.

## NWCR: Low Calorie Sweeteners and Weight Control<sup>1</sup>

- Design: Random sample (N=434) of NWCR participants (mean wt loss:  $34.2 \pm 18.5$  kg maintained for  $7.8 \pm 5.2$  yrs) responded to online survey about their consumption of low/no calorie sweetened beverages (LNCSB)
- Results
  - 53% regularly used LNCSB, while 10% regularly consumed SSB.
  - 78% who regularly used LNCSB reported they helped them control calorie intake
  - Top 5 reasons for using LNCSB were: taste (54%), satisfy thirst (40%), part of their routine (27%), reduce calories (22%), go with meals (21%)
  - Participants reported:
    - Changing their beverage choices was “very important” to successful weight loss (42%) and weight maintenance (40%) efforts
    - Increasing water consumption was the most common strategy reported with reducing SSB intake second

1. Catenacci VA, Pan Z, et al: Low/No Calorie Sweetened Beverage Consumption in National Weight Control Registry. Obesity. 2014;22(10): 2244-2251. <http://online.library.wiley.com/doi/10.1002/oby.20834/abstract>

## Weight Loss: Successful Strategies

- Ready, willing and able?<sup>1,2</sup>
- Focus, don't overwhelm<sup>1,2</sup>
- Choose behaviors most ready to change<sup>1,2</sup>
- Reduce total fat to  $\leq 30\%$  fat (don't focus on carb)<sup>2,3</sup>
- Use of meal replacements/structure<sup>3</sup>
- Include physical activity<sup>2-5</sup>
- Early success (wt loss) predicts later success (frequent contact early)<sup>5,6</sup>

1. Bisatt. Lessons from the DPP. On the Cutting Edge. Diabetes Care and Education. 2008;29(4).  
 2. Dishawry L, Nathan D. J Am Diet Assoc. 2008;108(Suppl1):566-72.  
 3. Wadden TA, et al. The Look AHEAD Research Group: One-year weight losses in the Look AHEAD study: Factors associated with success. Obesity. 2005;13(5):713-722.  
 4. Wadden TA, Neiberg RH, Wing RR, et al. The Look AHEAD Research Group (2011). Four-Year Weight Losses in the Look AHEAD Study: Factors Associated With Long-Term Success. Obesity. 2011;19:1987-1998.  
 5. Look AHEAD Research Group. Eight-year weight losses with an IL: The Look AHEAD Study. Obesity. 2014;22(1):5-13.  
 6. Graham Thomas J et al: Weight-loss maintenance for 10 yrs in NWCR. Am J Prev Med. 2014;46(1):17-23.

## Words of Wisdom and Sanity from Experts: B.J. Fogg, PhD

- Fogg equation: BC (behavior change) = M (motivation) + A (ability to make the change) + T (the trigger).
  - Tie new behavior to existing, easier to accomplish
- Build “success momentum” - one tiny habit change after another
- Can't break bad habits. We can, overtime, “untangle” them
- Behavior change mastery occurs due to continual practice. Eventually “healthy reflexes” emerge
- “Help people change what they already want to change, not what they know they should change but don't really want to.”



<https://www.bjfogg.com/>

## Weight Maintenance: Successful Strategies

- Physiologic realities<sup>1</sup>
  - Lower calorie needs to maintain lower weight: 300 – 400/day
- Food/Calories:
  - Low calorie, low fat intake<sup>2,3,4</sup>, eat breakfast<sup>2,5</sup>
  - Simplify eating plan, minimize choices<sup>3</sup>
- Physical Activity<sup>4</sup>:
  - Regular significant physical activity (60-90 min/day)<sup>2,4</sup>
  - Minimize sedentary behavior eg TV watching<sup>5</sup>
- Maintain continuous support
- Relapse prevention plan
- Regular self weigh-ins<sup>4,5</sup>

1. Rosenbaum M: Weight Management DPG Symposium. 2013.  
 2. Fatches. On the Cutting Edge. Diabetes Care and Education. 2008;29(4).  
 3. Wadden TA, Neiberg RH, Wing RR, et al. The Look AHEAD Research Group (2011). Four-Year Weight Losses in the Look AHEAD Study: Factors Associated With Long-Term Success. Obesity. 2011;19:1987-1998.  
 4. Look AHEAD Research Group. Eight-year weight losses with an IL: The Look AHEAD Study. Obesity. 2014;22(1):5-13.  
 5. Graham Thomas J et al: Weight-loss maintenance for 10 yrs in NWCR. Am J Prev Med. 2014;46(1):17-23.

### M.W. (Michael Wadja): One Year Later



- NDPP within DSMES, Chester County Hospital 4/17
- 3/18: A1c = 5.7%
- Wt: ~180 (maintenance)
- Wife: lost 25 lbs
- Motivation?  
*"Fear. I just don't want to have diabetes diabetes."*

