

Online Diabetes Prevention:

**Improved Glucose and Weight
plus
Wellness and Productivity**

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Palo Alto Medical Fndn: Marina Dolginsky

Outline

- **Background:** Dolginsky
- **The trial:** Design and Conduct: Dolginsky
- **The trial:** Results: Block
- **The program:** Block
- **Summary:** Block

Background

- **86 million** Americans with **pre-diabetes**
- **~70%** will eventually progress to **type 2 diabetes** without intervention
- Accounted for **one in 10** of U.S. health care dollars

Cost of diabetes

- **Medical expenditures, per year:**
 - \$13,700 vs. \$5,800
 - 2.3 times the cost of someone without diabetes
- **Absenteeism, reduced productivity:**
 - \$69 billion
- **Mostly borne by employers**

Diabetes can be Prevented

- **Diabetes Prevention Program (DPP) Randomized Trial**
 - Lifestyle vs. Metformin vs. Placebo.
 - Lifestyle reduced progression to diabetes by 58% compared to metformin or placebo
- **Proves lifestyle change** (diet, exercise, weight loss) can lower risk of diabetes
- **But DPP very resource-intensive & \$\$\$**

Many Programs Based on DPP

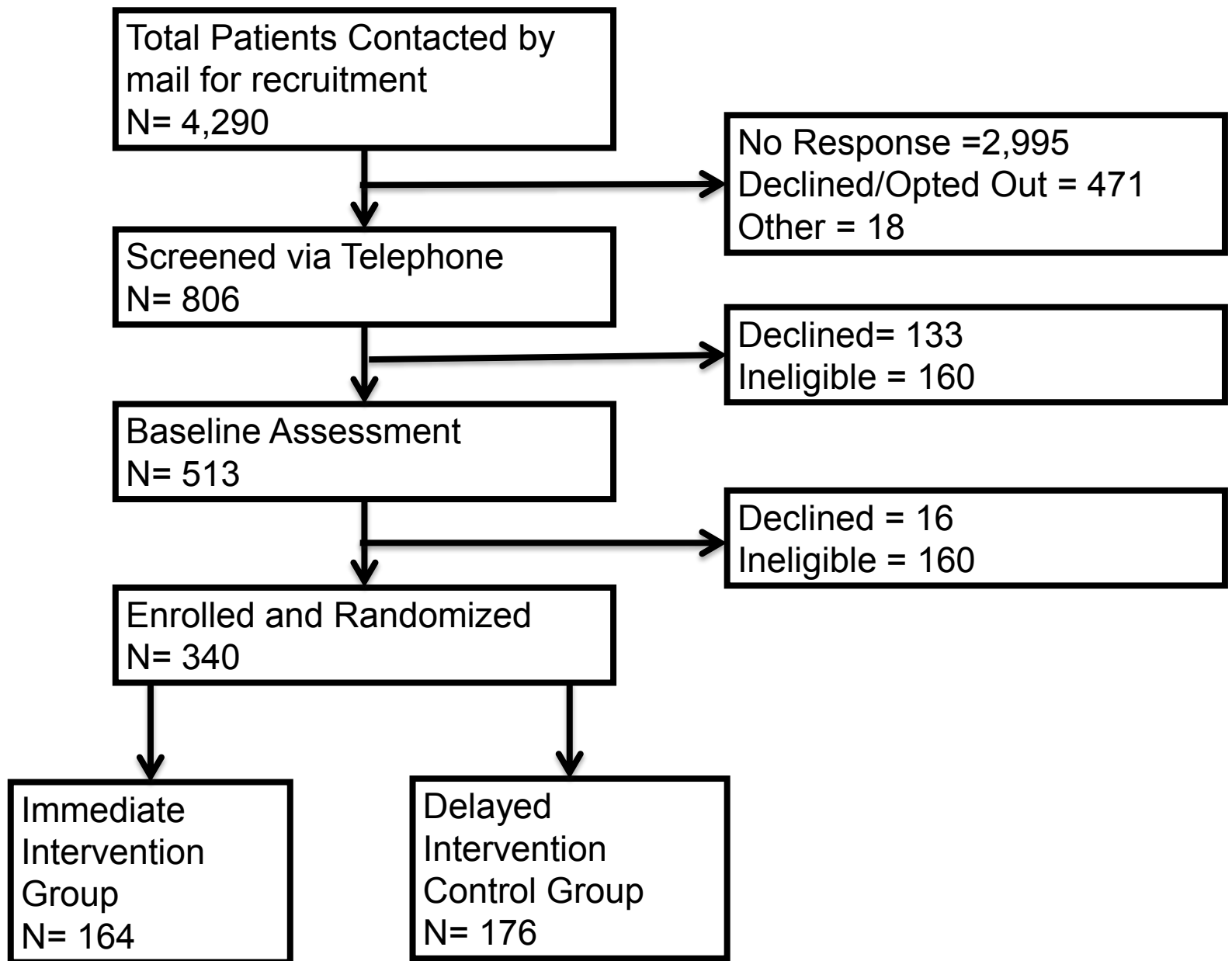
- Face-to-face programs with human coaches
- Online programs with human coaches
- Use of human coaches raises the cost
- The question we asked:
 - **Can a fully automated program be effective?**

What we did

- The program, Alive-PD, was developed by Turnaround Health, with NIH funding
 - Listed on CDC's DPRP program
- The randomized trial was a collaboration between Turnaround Health and Palo Alto Medical Foundation Research Institute (PAMF)
 - Among PAMF members

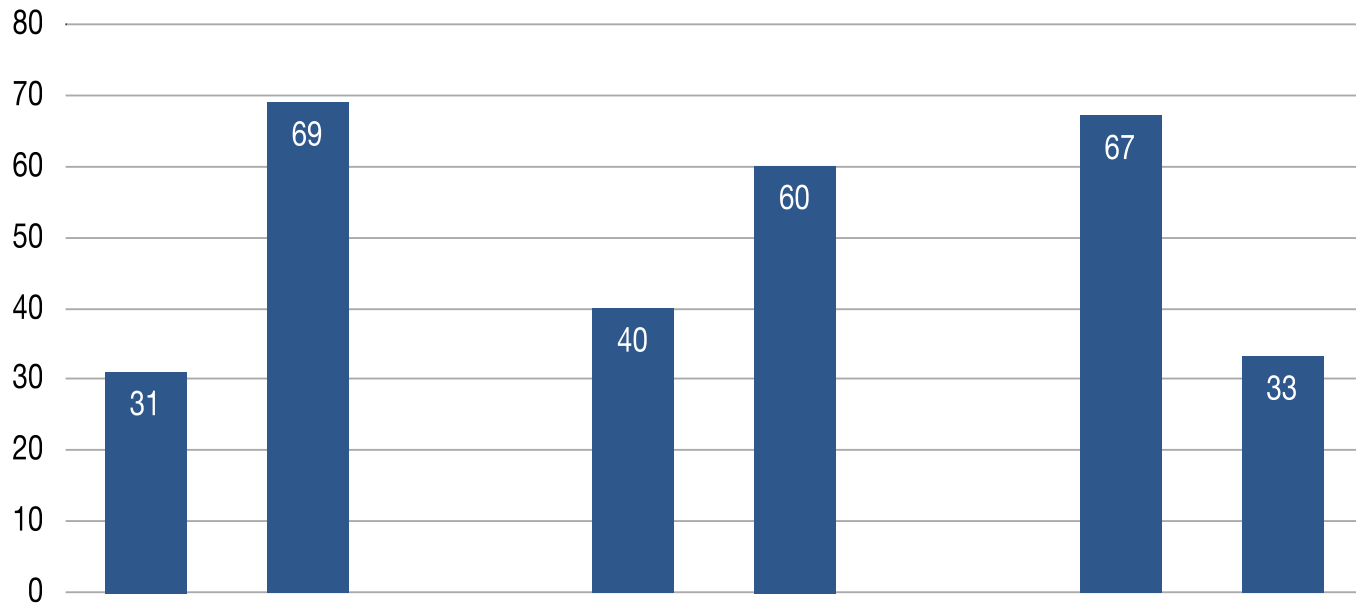
Design: Randomized Controlled Trial

- **Eligibility:**
 - Pre-diabetes by either HbA1c or fasting glucose
 - BMI ≥ 27 kg/m²
- **Randomized:** Alive-PD or 6-month delayed control
- **Primary outcome measures:**
 - Change in HbA1c,
 - Change in fasting glucose
- **Clinical measures:** Baseline, 3 and 6 months
- **Intention-to-treat analysis**



Characteristics of Sample

Percent



Characteristics of Sample

	Mean
Age (y)	55
Weight (lbs)	205
BMI	31
Pre-diabetic by either HbA1c or fasting glucose	100%

- Are there any questions about the design or conduct of the trial?
- Dr. Block will tell you about the program, and about the results of the trial.

Overview of the Alive-PD program

- One-year behavior-change program
- Focus:
 - increase physical activity
 - improve eating habits
 - lose some weight
- Listed on CDC DPRP

Overview (2)

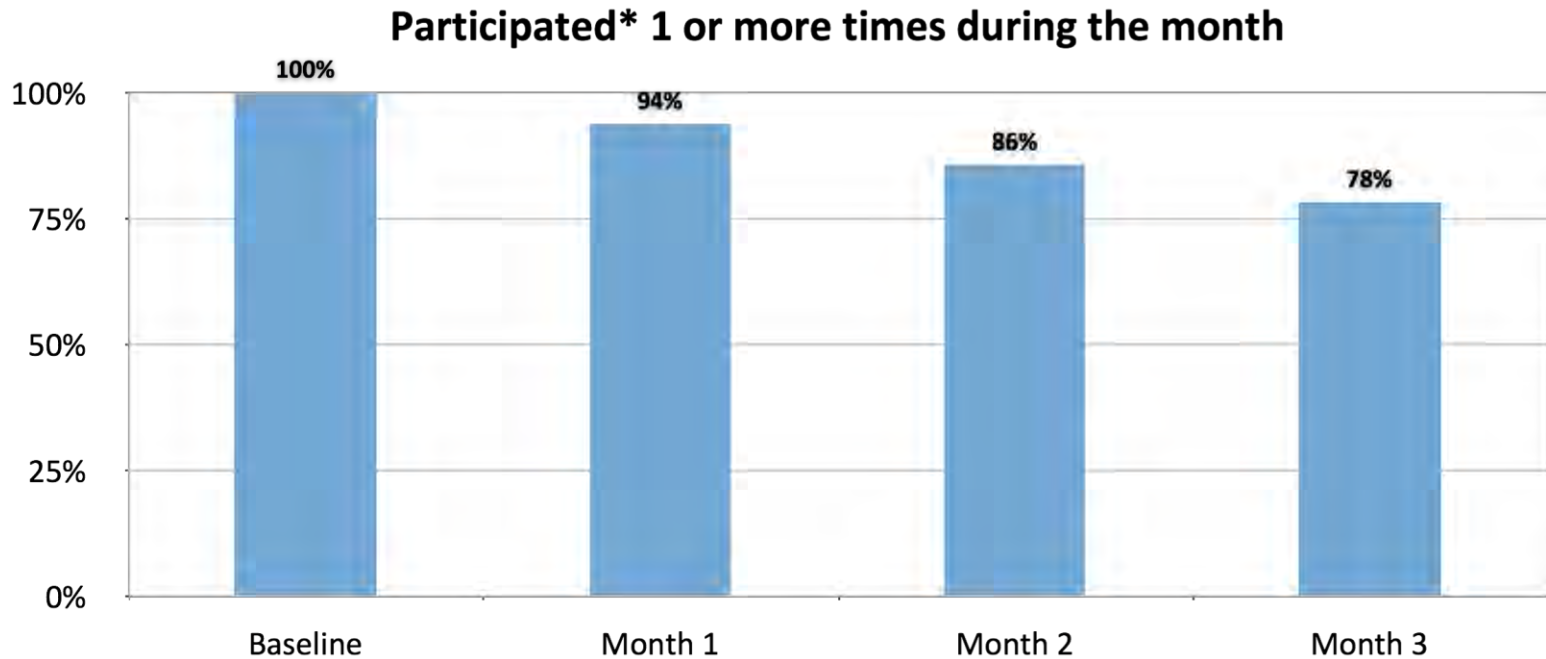
- **Fully automated, algorithm-driven**
 - No coaches
- Weekly contact
- email “push”
- Individualized web page
- Automated IVR phone coaching
- Smartphone app

Some Behavioral Principles

- Goal-setting
- Tailoring
- Coaching
- Reminders
- Social support
- Planning/Scheduling/Reporting
- Content
- Engagement

Randomized Trial Results

Engagement and Retention



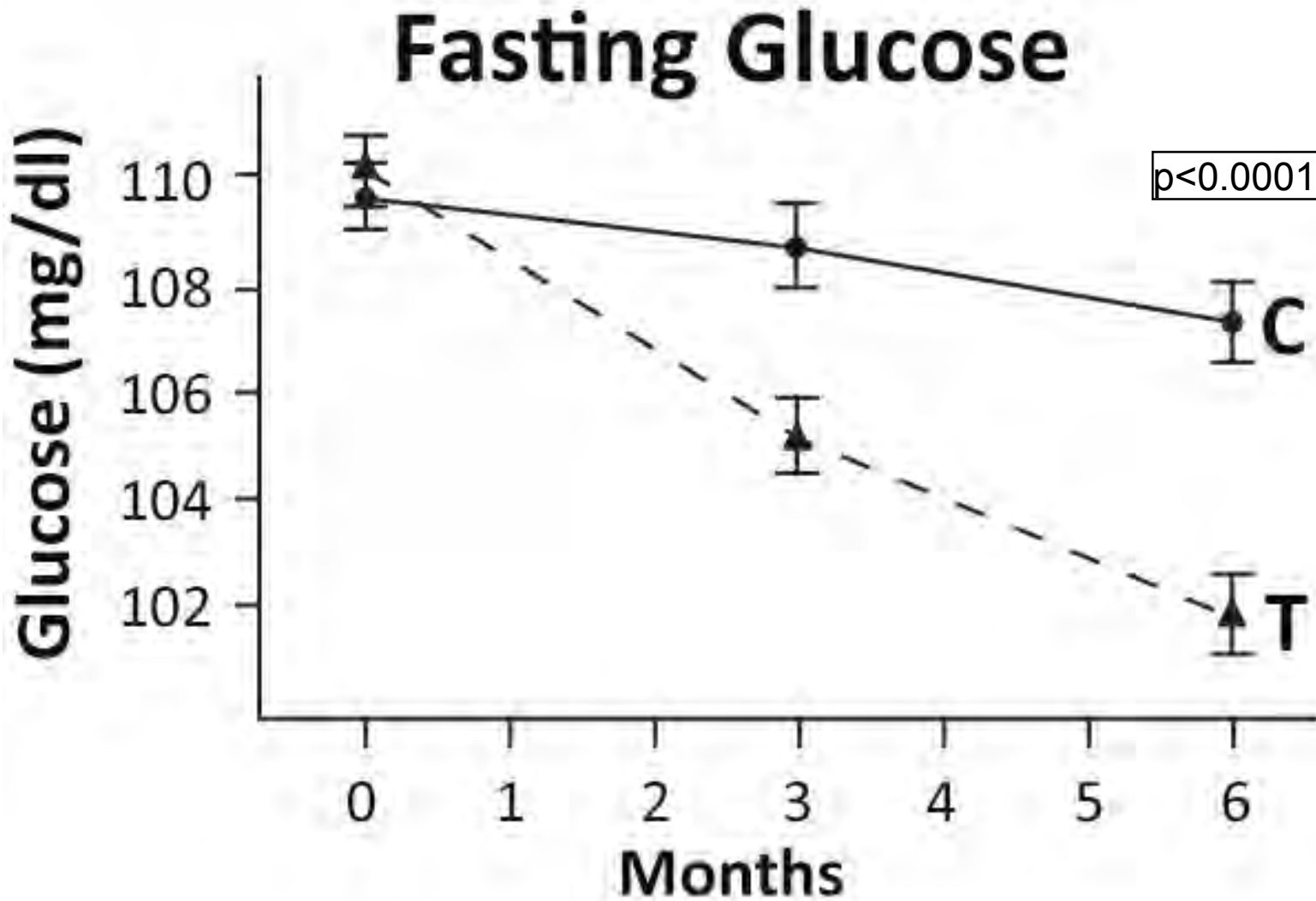
71% still interacting with program in 6th month

* Chose a goal, reported on a goal, accomplished a goal, answered a home page quiz, logged with tracking tool, sent support message.

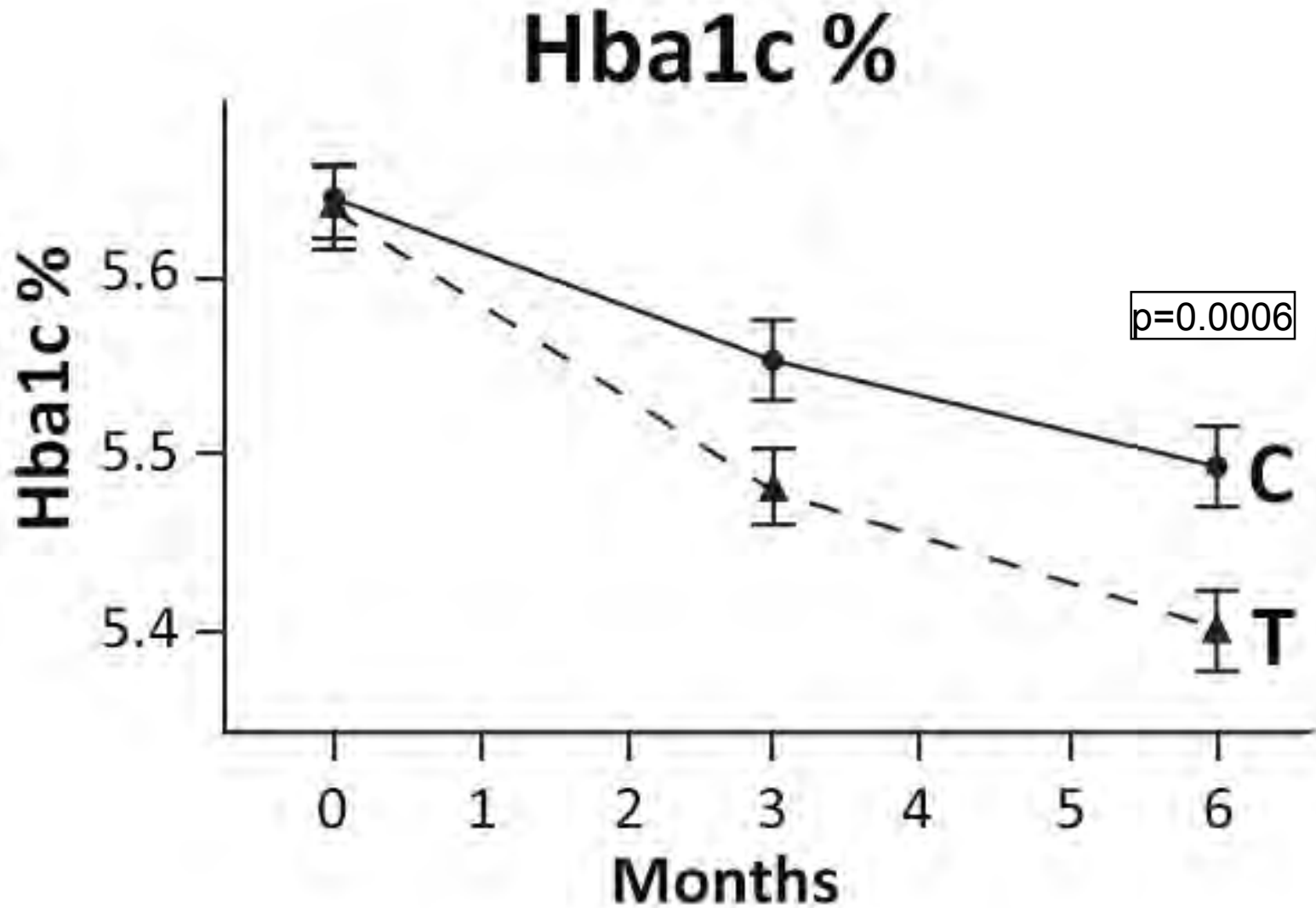
Major Outcomes

1) Clinic-measured

Treatment Effect



Treatment Effect

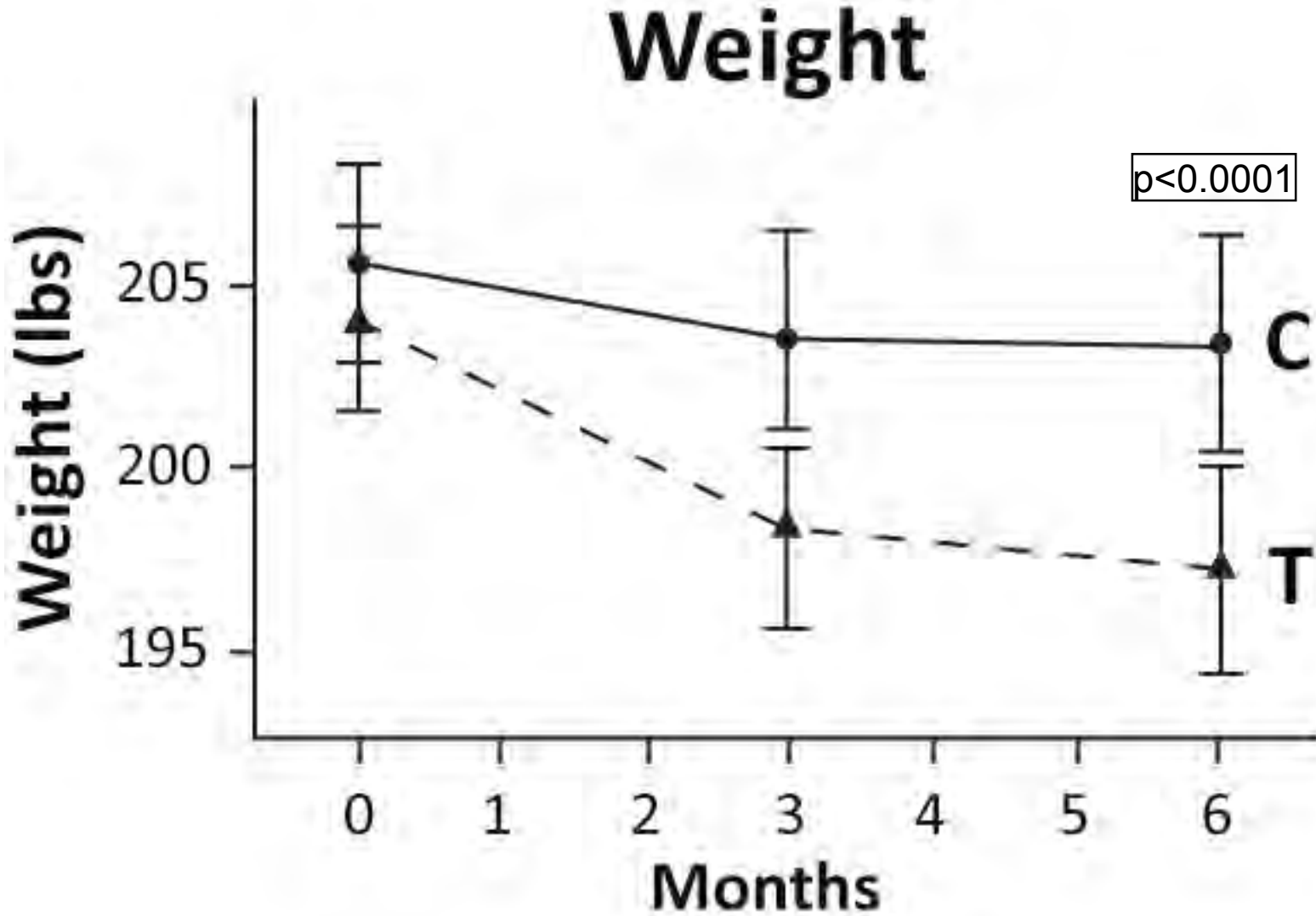


Preventing Diabetes!



of those pre-diabetic by A1c
were normal at 6 months

Treatment Effect



Weight Loss in Alive-PD



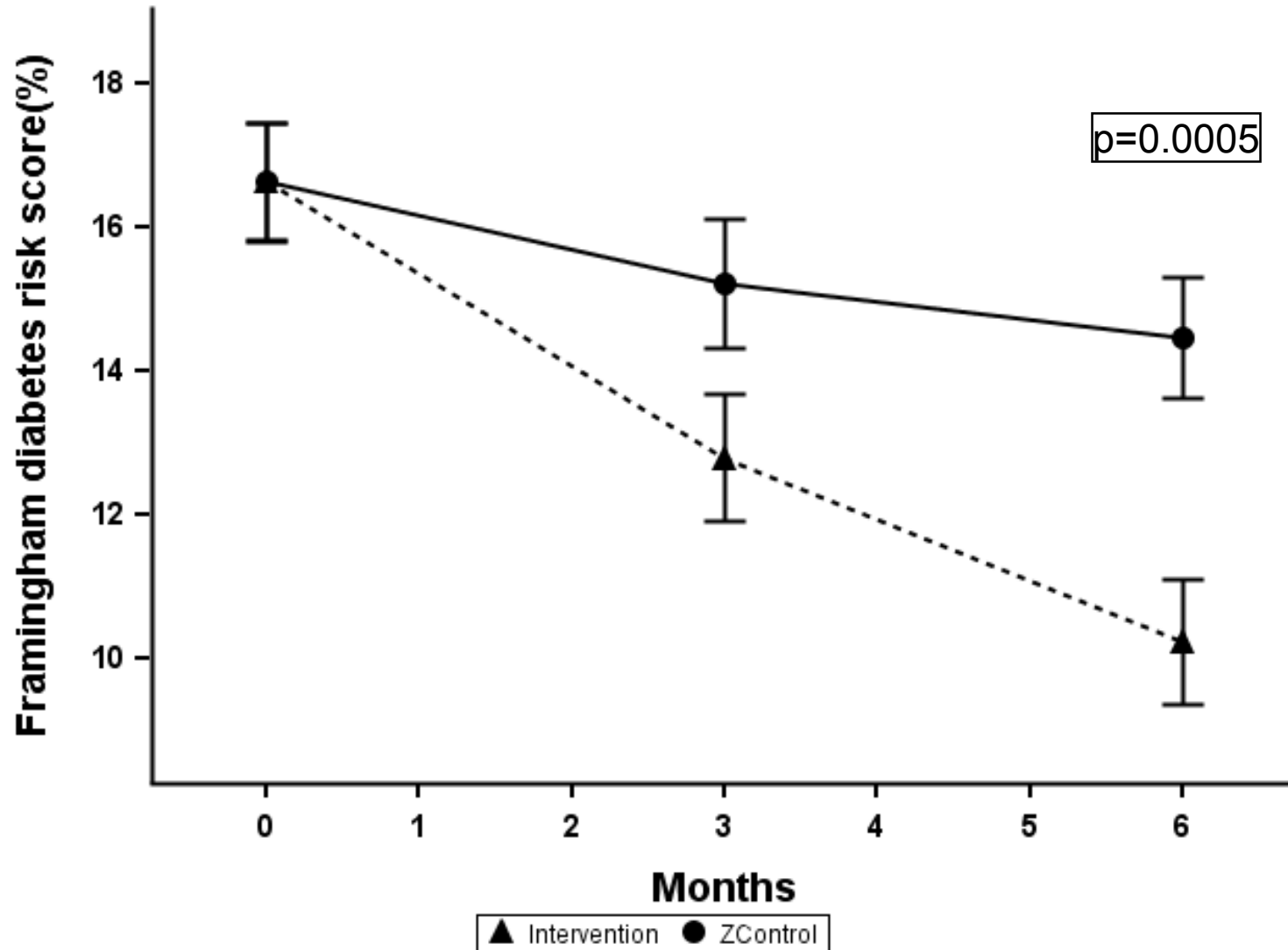
lost weight at 6 months

Cost per Pounds Lost

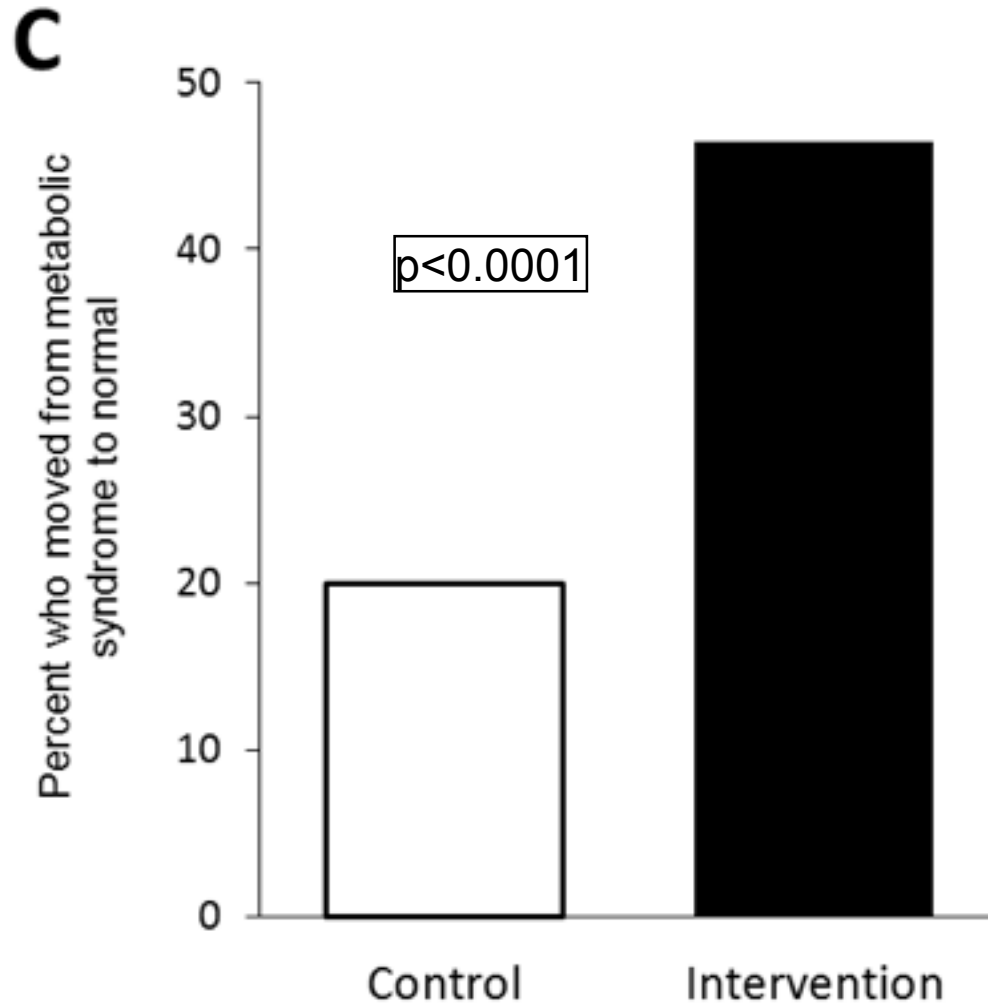
- Counting everyone who signed up:
- **\$17.70 per pound lost**
 - At \$100 per signed-up participant:
- vs YMCA DPP: \$40 per pound lost

Treatment Effect

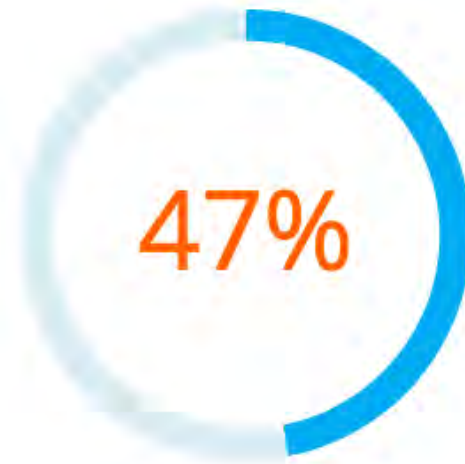
Framingham 8-year Risk Score



Treatment Effect: Metabolic Syndrome



Reducing Metabolic Syndrome



of those with metabolic
syndrome did not have it at
6 months

Case Report on Diabetic Subjects

- Fasting glucose in diabetic range (n=8)
- Intervention (n=5)
 - 4 moved to pre-diabetic range
 - 1 moved to normal range
- Control (n=3)
 - All still in diabetic range

Major Outcomes

- 1) Clinic-measured
- 2) Diet, activity

Change in Aerobic Activity

