Body Composition and Adherence to a Yearlong Exercise Intervention Among Previously Sedentary Men and Women

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FHCRC
Acknowledgements

- Anne McTiernan
- Catherine Alfano
- Melinda Irwin
- APPEAL Study co-investigators
- APPEAL Study participants
Obesity, exercise and cancer

- For several major cancers, 25-30% of incidence attributable to obesity and physical inactivity*
  - Colon
  - Breast
  - Endometrial
  - Kidney
  - Esophageal
- Increased risk of recurrence
- Increased survival

* Vaino & Bianchini (2002)
We need good adherence...

- Efficacy

...And good measurement of adherence

- Interpretability
- Dose-response
- Prediction of behavior
Adherence to exercise trials

- Typical adherence rate: 63-83% of prescribed sessions*

- Little consistency in how adherence is defined/measured
  - Definition: Frequency? Duration? Intensity?
  - Measurement time points
  - Self-report vs. objective measures

- Adherence may vary according to:
  - Demographic (e.g. age, SES)
  - Psychosocial (e.g. depressive symptoms, exercise self-efficacy)
  - Physical (e.g. cardiovascular fitness)

* Martin, Bowen, Dunbar, & Perri (2000)
Objective

- Does body mass index (BMI) predict how well sedentary adults will adhere to a yearlong exercise intervention?
  - Men
  - Women
Determine effect of 1 year exercise vs. control on:

- Proliferation rate
- Apoptosis-related proteins (bax/bcl-2 ratio)
- Rectal mucosa prostaglandin levels (PGE2 & PGF2α)
- Insulin, C-peptide, glucose, triglycerides, IGF-1, IGFBP-3
- Body weight, fat mass, fat distribution
- Fitness
- Patient-reported outcomes
Study design

- **Participants:**
  - 202 healthy, sedentary men & women, 40-75

- **Intervention**
  - Goal: 6 days / 60 minutes per day
  - Moderate-to-vigorous: 60-85% max heart rate
  - 3 days at gym, 3 days at home
  - HR monitors, pedometers, logs, progress meetings
# Participant characteristics

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td>Age</td>
<td>54.4 (7.1)</td>
<td>56.2 (6.7)</td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>85.7%</td>
<td>94.1%</td>
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<tr>
<td>BMI</td>
<td>28.9 (5.5)</td>
<td>29.7 (3.7)</td>
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<tr>
<td>Steps/day</td>
<td>5,959 (2,567)</td>
<td>5,967 (2,778)</td>
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<tr>
<td>Exercise (min/week)</td>
<td>26.8 (47.7)</td>
<td>22.2 (58.3)</td>
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Definition of adherence

- Frequency: Mean days/wk of mod-vigorous PA
- Duration: Mean min/wk of mod-vigorous PA
- Dose: Mean MET-hours/week
- Fitness: $\Delta VO_2^{max}$ from baseline to 12 months

Study exercise goal: 60 minutes, 6 days a week (360 min/week)
Adherence over time: Days/wk
Adherence over time: Min/wk

Min/week

0-3 Months  3-6 Months  6-9 Months  9-12 Months

Women
Men
Adherence by BMI: Days/week

- Healthy
- Overweight
- Obese

* Indicates a significant difference.
Adherence by BMI: Min/week

- **Men**
  - Healthy: 350 min/week
  - Overweight: 300 min/week
  - Obese: 250 min/week

- **Women**
  - Healthy: 300 min/week
  - Overweight: 250 min/week
  - Obese: 200 min/week

*Significant difference
Adherence by BMI: Dose

![Graph showing adherence by BMI and dose for men and women. The graph displays MET-min/week on the y-axis and BMI categories on the x-axis. The graph includes bars for healthy, overweight, and obese groups, with error bars indicating variability. There is a significant difference marked with an asterisk (*) for women in the obese group.]
Adherence by BMI: $\Delta VO_2\text{max}$

* 12-month VO$_2\text{max}$ – baseline VO$_2\text{max}$
Strengths and Limitations

- **Strengths**
  - Randomized controlled trial
  - High adherence goal
  - Good physical activity assessment
  - Objective height & weight measurement

- **Limitation: limited generalizability**
  - Homogenous sample
  - Healthy participant effect
  - Efficacy trial
Summary

- 12-month intervention among 100 sedentary adults
- Obesity associated with poorer adherence in women
- BMI not strong predictor of adherence in men

Implications

- Need for tailored interventions, better strategies for promoting adherence
- Barriers, benefits, etc.
- Mediators?
"I'm trying to squeeze 30 minutes of exercise into my daily schedule. Today I took 120 fifteen-second walks."