Sedentary Behavior Change in the Context of a Physical Activity Intervention for Older Adults

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Acknowledgements

- Co-authors:
  - Dr. Jordan Carlson, University of Missouri-Kansas city
  - Suni Godbole, UC San Diego
  - John Bellettiere, UC San Diego
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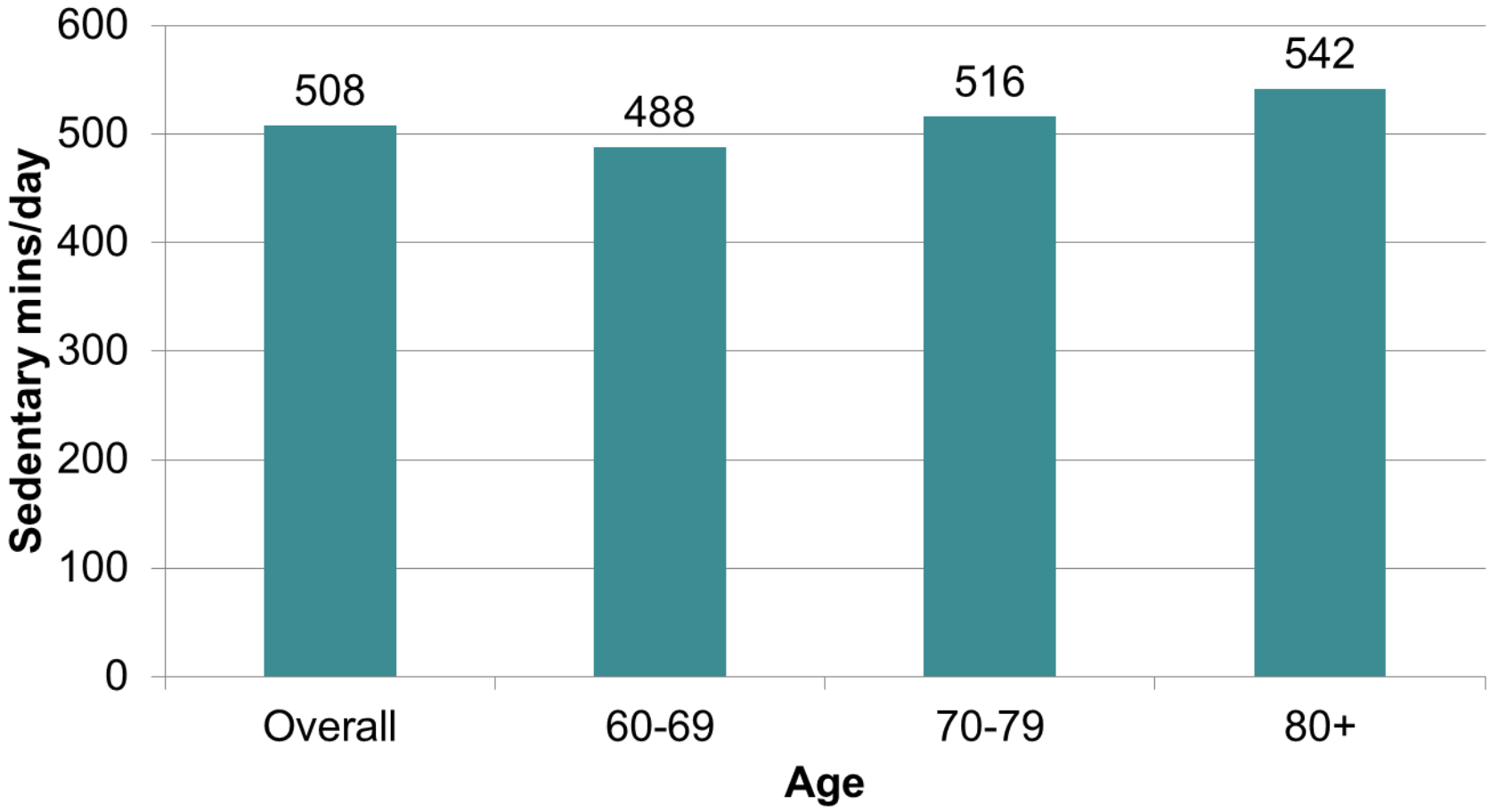
Background

- Older adults have low physical activity (PA)
  - PA has a variety of health benefits
- Older adults have high sedentary time (ST)
  - Activities that involve low energy expenditure and a sitting or reclining posture
- ST is associated with chronic diseases (diabetes, CVD), mortality, mental health (even after adjusting for PA)

NHANES Minutes/day Sedentary



Evenson et al. Prev Chronic Dis. 2012

Do PA Interventions Impact ST?

- If PA interventions also reduce ST, then targeted interventions for ST may not be needed
- If PA does not impact ST or increases ST, then specific interventions would be needed
- Potential options:
  - PA reduces ST (displacement; black arrow)
  - PA does not impact ST (independence; green arrow)
  - PA increases ST (compensation)

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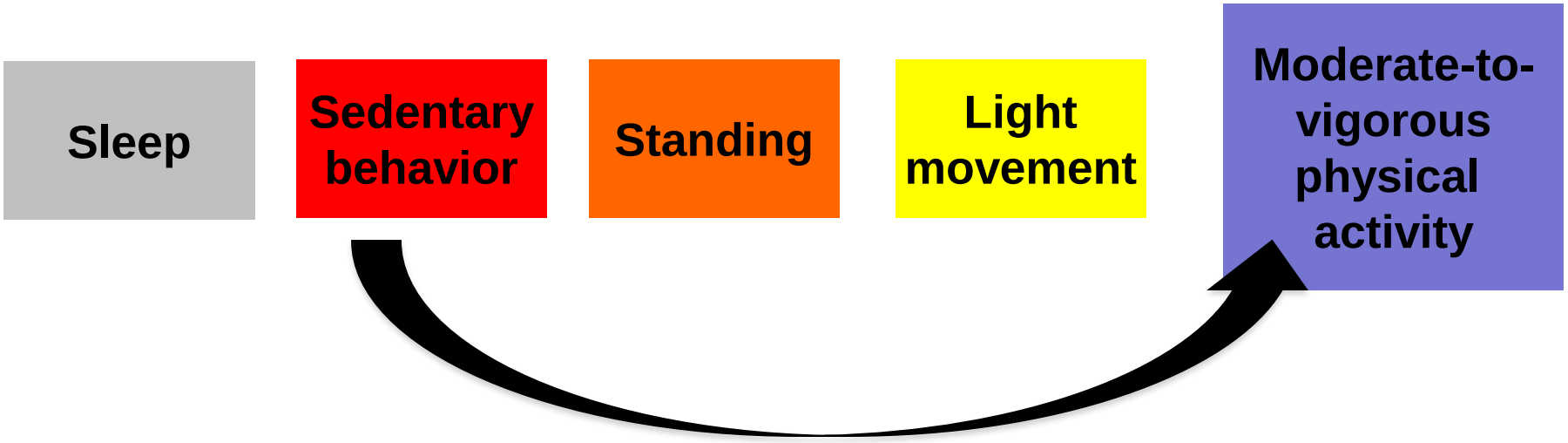

Black arrow = displacement
Green arrow = independence

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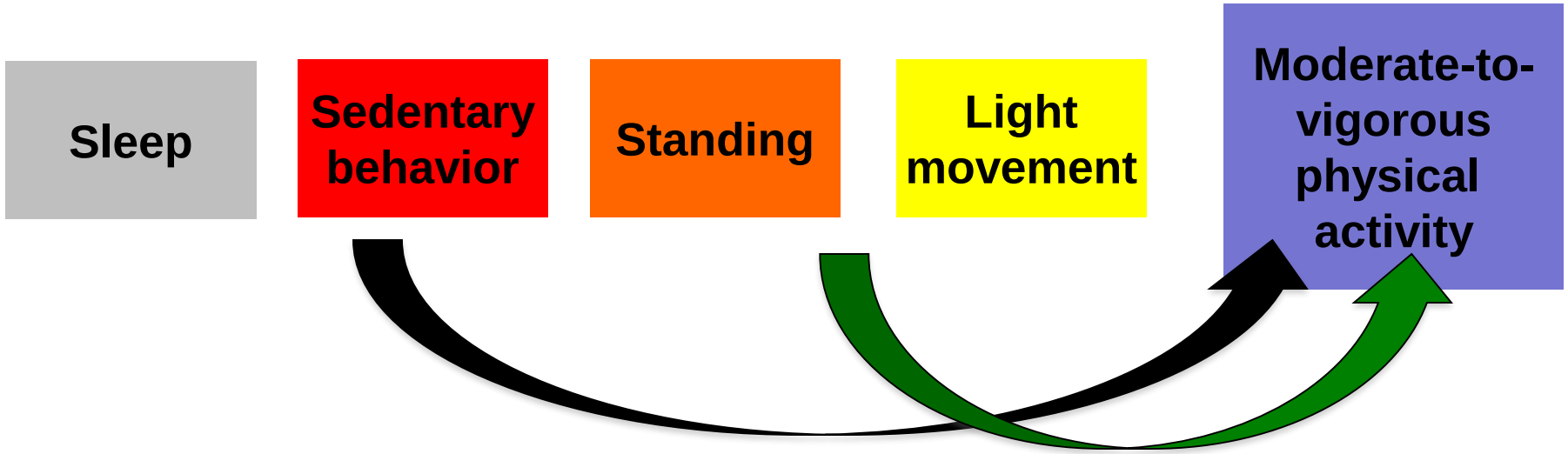

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Prior Studies

- Findings from meta-analyses suggest that ST-specific interventions result in much larger changes to ST than PA interventions (Prince 2014, Martin 2015)
  - Very few studies among older adults using device-based measures of ST
    - Two suggest there may be displacement effects (Mutrie 2012; DeGreef 2011)

Purpose of the Current Study

- Examine whether a PA intervention (with limited content on ST) impacts device-measured ST among older adults living in retirement communities over 1-year

MIPARC
A PATH TO HEALTHY AGING

Methods/Participants

- Cluster randomized trial in 11 continuing care retirement communities in San Diego County (2010-2013)
- Site eligibility
  - >100 residents
  - Store or park within 1 mile
- Participant eligibility:
  - Age 65 or older
  - Complete timed up and go in less than 30 seconds
  - Able to walk 20 meters without human assistance
  - No fall within 12 months resulting in hospitalization
  - Physician approval to participate (intervention only)

Site Randomization

A multilevel physical activity program [MIPARC] focused on increasing walking by providing individual, group, and community-level supports (based on ecological model).

OR

A successful aging [SA] program focused on factors that contribute to healthy aging, including: social connections, continued learning, adaptability, and health.

MIPARC Intervention

Individual level
Pedometers & logs
Education materials
Health counseling calls (4 sessions over 2 months)

Interpersonal level
Groups (9 sessions over 6 months)
Peer led group walks (months 3-12)

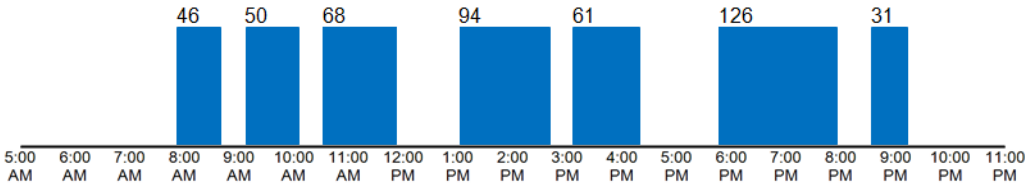
Environmental level
Signage
Walking route maps
Resource enumeration

Policy level
Resource review
Advocacy for built environment changes

→

1 group session topic focused on sedentary behavior after 3 month assessment)
-Education & handout
-Graphical feedback
-Goal to take at least 10 standing breaks every day

Below are the times of the day when you were sitting for more than 30 minutes at a time without standing up. The bars in the graph represent these periods of prolonged sitting, and the number above the bar represents minutes of sitting. The times in the table at the bottom of the page correspond with the graph. Can you remember what you were doing at these times? Is this a typical day for you?



Successful Aging Control

- 9 group sessions
  - 30 minutes sharing on the topic, education presentation, discussion
  - Example topics: writing your own story, San Diego history, aging with humor, brain fitness, sleep habits
- 4 phone calls
  - Asked about the sessions, the take home activities, and health status
- Peer leaders tailor the program to the site and complete participant reminders

Outcomes: Sedentary Time

- Actigraph GT3X: Waist worn accelerometer for one week at baseline and 3, 6, 9 and 12 months

- Sedentary time metrics include:
  - Total sedentary time: minutes spent <100 cpm
  - Usual bout length: duration at which 50% of sedentary time is accumulated
  - Number of breaks from sedentary time per day

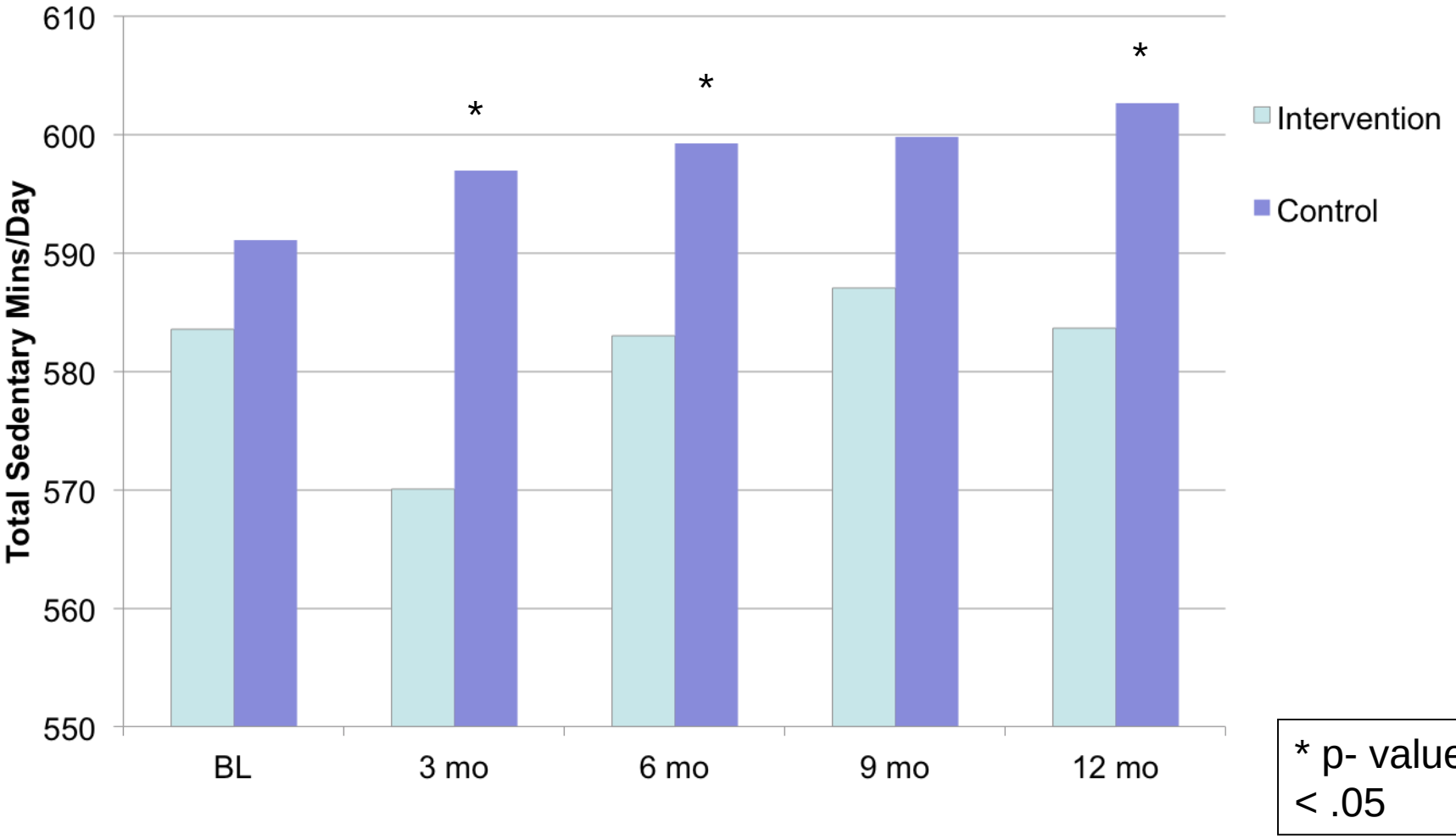
Analysis

- Generalized linear mixed effects regression models
  - Adjusted for group cluster, accelerometer wear time and demographics (age, sex, marital status)

Baseline Demographics

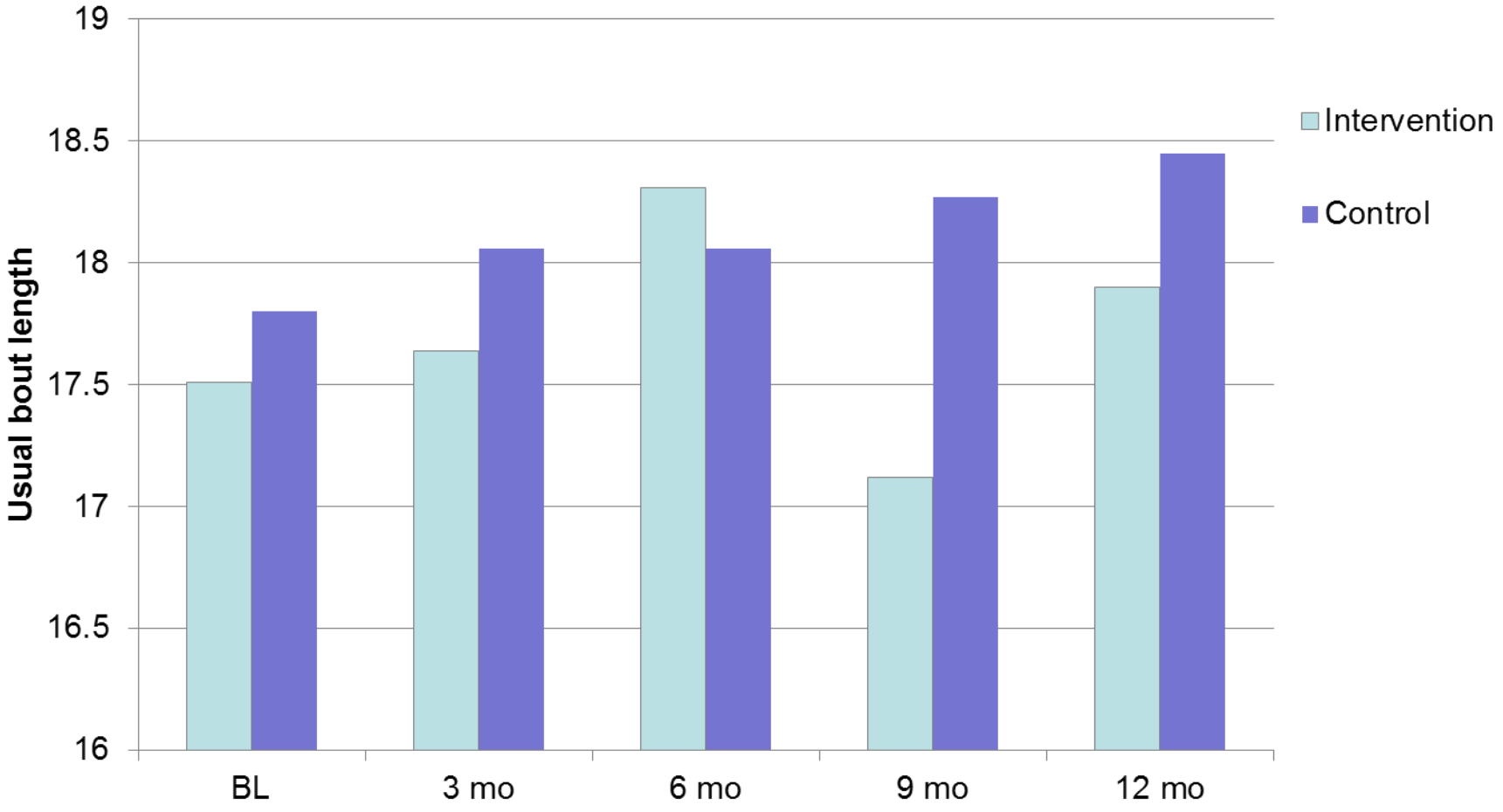
- N at BL = 307
- N at 12 months = 217
- Mean age = 84 (+/- 6)
- 28% male
- 41% married
- 64% college education
- 7% non-white
- BL mean total ST = 9.7 hours/day

Total Sedentary Time

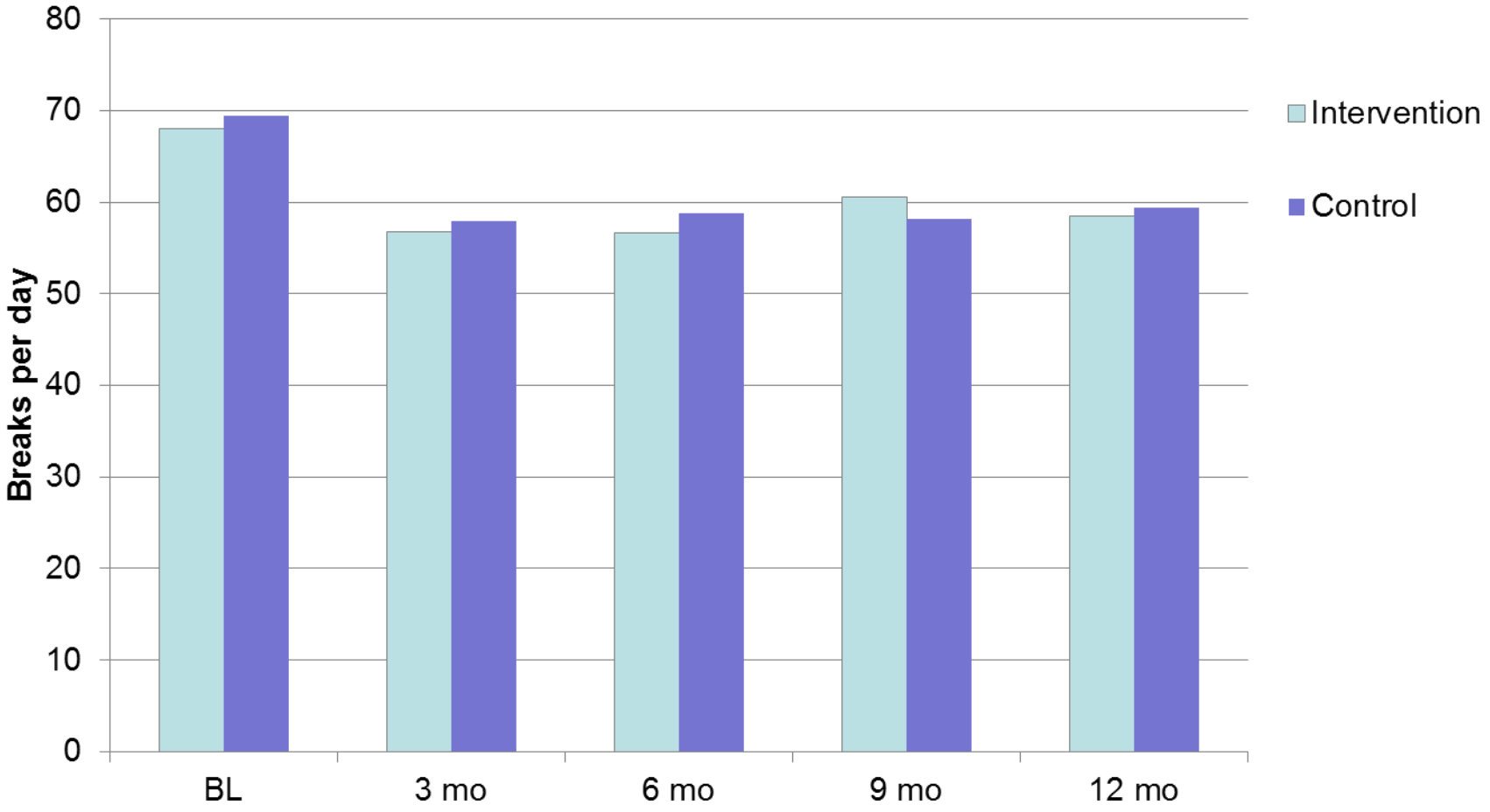


* p- values < .05

Usual bout length



Breaks from ST



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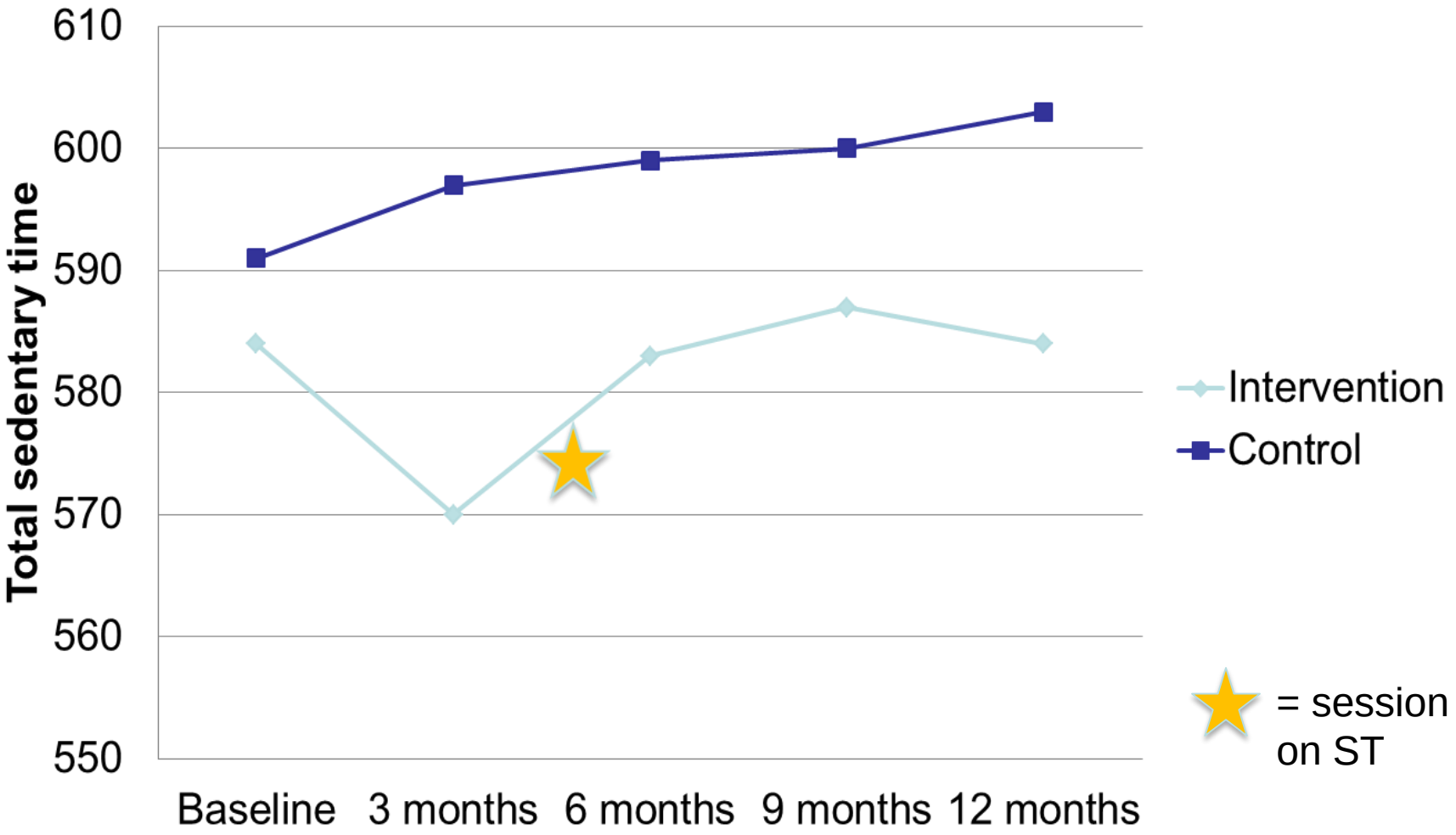
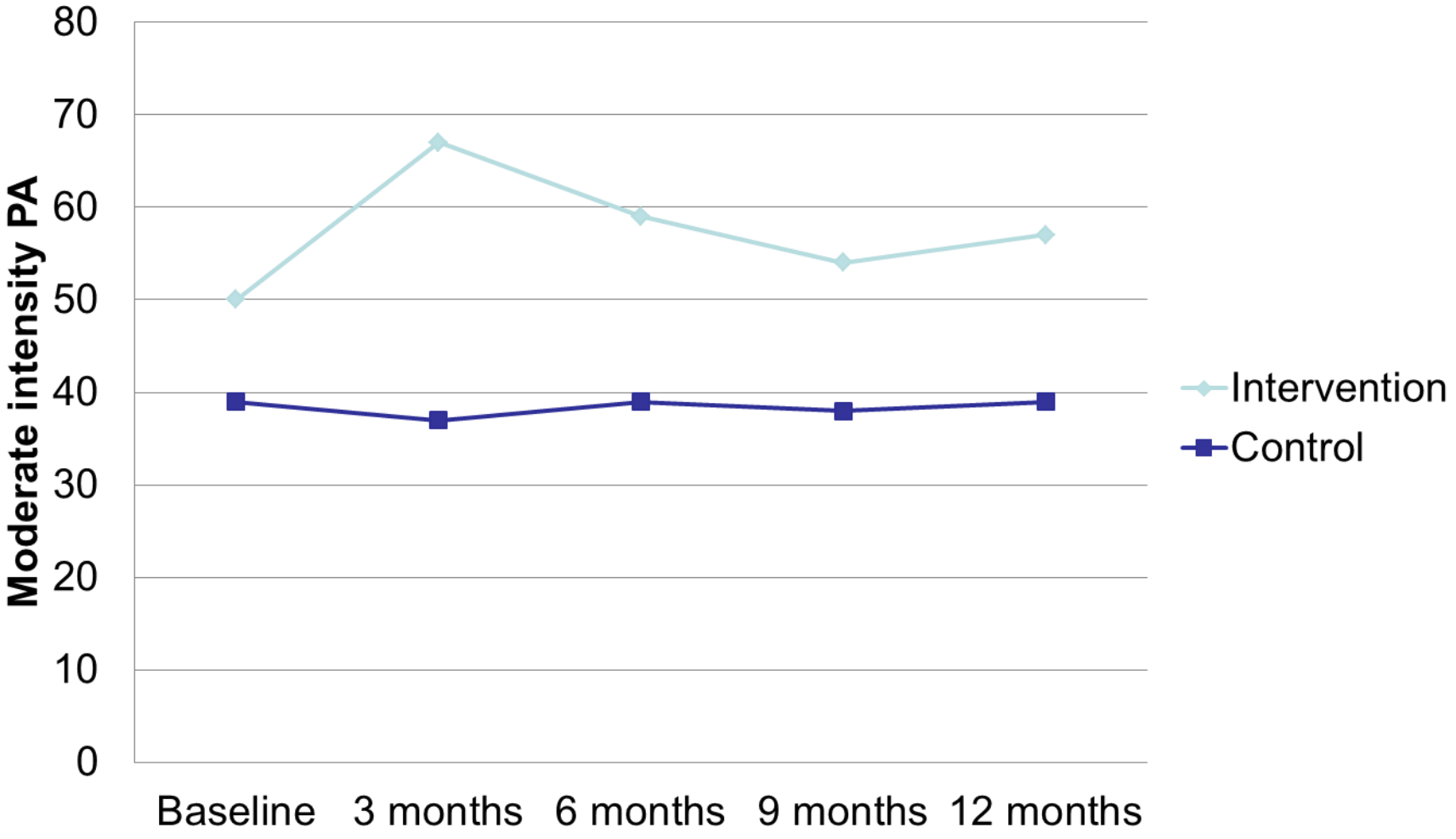


Moderate Intensity PA



Summary

- Sedentary time is high in older adults living in retirement communities with an average age of 84
- Findings:
  - Controls: ST increased by ~12 minutes/day over the year
  - Intervention: ST stayed about the same over the year

Summary Continued

- The PA intervention did not increase ST (no evidence for compensation effects)
- At month 3, it appeared the increase in PA may have helped reduce ST (some evidence for a displacement effect)
- Overall, the PA intervention did not substantially impact ST (support for independence hypothesis)
  - Total ST reductions were modest
  - Break and bout metrics were not differentially impacted by the intervention
  - Suggests that more intensive and specific interventions likely needed

Study Limitations

- Actigraph may include time standing as sedentary
  - Would not have captured increased standing time
- No measurements occurred directly after the session on ST
- Sample size reduced at 12 months (71%)

Conclusions

- In very old adults, PA did not reduce ST by a large amount
  - Some evidence for both displacement and independence effects
  - Similar to studies in adult populations
- For larger impacts on ST and breaks specific behavioral interventions are needed
  - Such interventions could be useful in old adults who are highly sedentary

Thank you!

More information on study design:

Kerr, Rosenberg, et al. Contemporary Clinical Trials 33 (2012): 1180-1189.

Questions?

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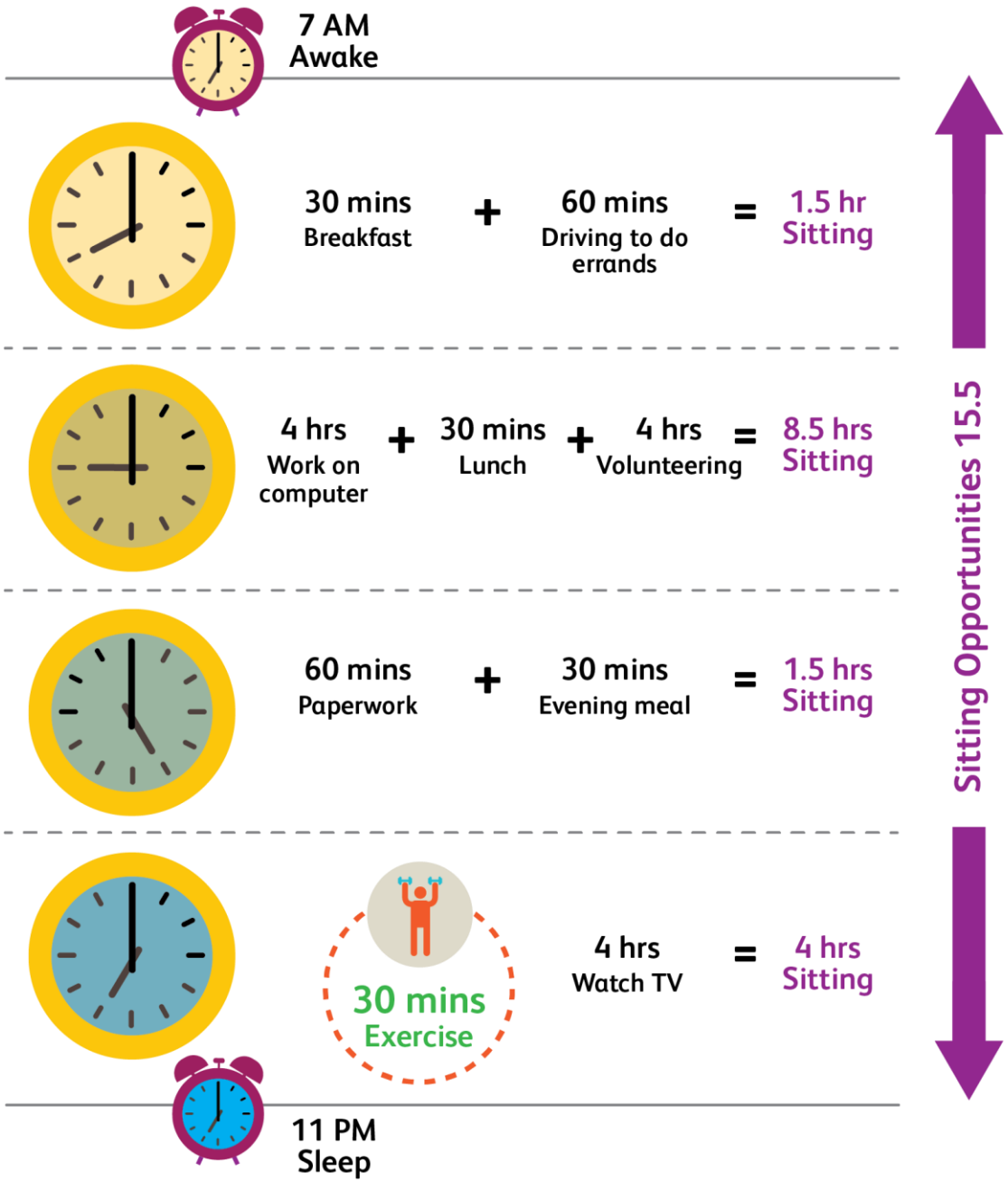
7 AM
Awake
30 mins
Breakfast
+
60 mins
Driving to do errands
=
1.5 hr
Sitting
4 hrs
Work on computer
+
30 mins
Lunch
+
4 hrs
Volunteering
=
8.5 hrs
Sitting
60 mins
Paperwork
+
30 mins
Evening meal
=
1.5 hrs
Sitting
30 mins
Exercise
4 hrs
Watch TV
=
4 hrs
Sitting
11 PM
Sleep
Sitting Opportunities 15.5