

# Creating Healthy Workplaces Series

## Reducing Prolonged Sitting

### *Findings from Stand Up Victoria*



**A/Prof Genevieve Healy, PhD MPH**

National Health and Medical Research Council Career Development Fellow

School of Public Health

The University of Queensland, Australia



[g.healy@uq.edu.au](mailto:g.healy@uq.edu.au)





## Reducing prolonged sitting in the workplace

An evidence review: summary report

- Population groups that are most at risk of prolonged sitting include those working in **offices**, transportation, and highly mechanised trades.
- Identified best practice approaches to addressing prolonged sitting in the workplace

# Intervention development

- Systematic, evidence-guided, comprehensive

Neuhaus et al. *International Journal of Behavioral Nutrition and Physical Activity* 2014, 11:21  
<http://www.ijbnpa.org/content/11/1/21>



## METHODOLOGY

Open Access

### Iterative development of Stand Up Australia: a multi-component intervention to reduce workplace sitting

Maïke Neuhaus<sup>1\*</sup>, Genevieve N Healy<sup>2</sup>, Brianna S Fjeldsoe<sup>1</sup>, Sheleigh Lawler<sup>1</sup>, Neville Owen<sup>1,3,4</sup>, David W Dunstan<sup>2,5,6</sup>, Anthony D LaMontagne<sup>7</sup> and Elizabeth G Eakin<sup>1,2</sup>

#### Abstract

**Background:** Sitting, particularly in prolonged, unbroken bouts, is widespread within the office workplace, yet few interventions have addressed this newly-identified health risk behaviour. This paper describes the iterative development process and resulting intervention procedures for the *Stand Up Australia* research program focusing on a multi-component workplace intervention to reduce sitting time.

**Methods:** The development of *Stand Up Australia* followed three phases. 1) Conceptualisation: *Stand Up Australia* was based on social cognitive theory and social ecological model components. These were operationalised via a taxonomy of intervention strategies and designed to target multiple levels of influence including: organisational structures (e.g. via management consultation), the physical work environment (via provision of height-adjustable workstations), and individual employees (e.g. via face-to-face coaching). 2) Formative research: Intervention components were separately tested for their feasibility and acceptability. 3) Pilot studies: *Stand Up Compare* tested the integrated intervention elements in a controlled pilot study examining efficacy, feasibility and acceptability. *Stand Up UQ* examined the additional value of the organisational- and individual-level components over height-adjustable workstations only in a three-arm controlled trial. In both pilot studies, office workers' sitting time was measured objectively using activPAL3 devices and the intervention was refined based on qualitative feedback from managers and employees.

**Results:** Results and feedback from participants and managers involved in the intervention development phases suggest high efficacy, acceptance, and feasibility of all intervention components. The final version of the *Stand Up Australia* intervention includes strategies at the organisational (senior management consultation, representatives consultation workshop, team champions, staff information and brainstorming session with information booklet, and supportive emails from managers to staff), environmental (height-adjustable workstations), and individual level (face-to-face coaching session and telephone support). *Stand Up Australia* is currently being evaluated in the context of a cluster-randomised controlled trial at the Department of Human Services (DHS) in Melbourne, Australia.

**Conclusions:** *Stand Up Australia* is an evidence-guided and systematically developed workplace intervention targeting reductions in office workers' sitting time.

**Keywords:** Intervention development, Sedentary behaviour, Sitting time, Sit-stand, Physical activity, Postural transitions, Workplace, Workplace intervention, Office workers, Height-adjustable workstations

\* Correspondence: [mneuhaus@uq.edu.au](mailto:mneuhaus@uq.edu.au)

<sup>1</sup>The University of Queensland, School of Population Health, Cancer Prevention Research Centre, Herston, Queensland, Australia

Full list of author information is available at the end of the article



© 2014 Neuhaus et al.; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly credited.

Multiple influences  
Participatory approach  
Strong evaluation framework

Conceptualisation

Formative  
Research

Implementation

Evaluation

Intervention  
Refinement

# Key intervention messages

---

## ***Stand Up***

- Reduce the length of sitting bouts, increase standing

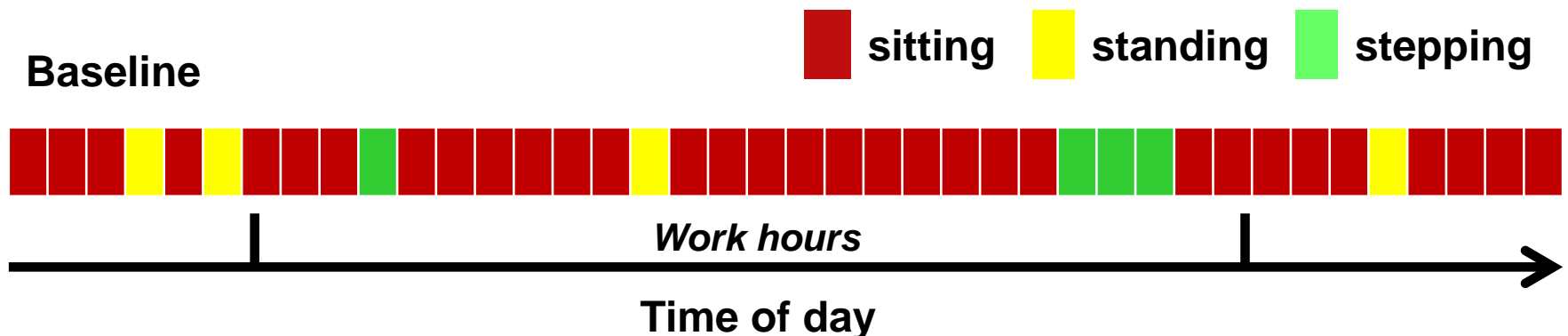
## ***Sit Less***

- Reduce total workplace sitting time & the number of sitting bouts

## ***Move More***

- Increase moving time

***Make changes throughout the day (in and out of the workplace)***



Management consultation  
Team champion training  
Staff information session  
Management emails to staff

Staff information session  
Written material  
Individual coaching  
Support phone calls  
Self-monitoring tools

Organisational

Individual

**Stand Up, Sit Less, Move More**

Physical environment



# Stand Up Victoria

- Cluster-RCT in one organisation
- Assessments @ baseline, 3-months, 12 months
  - activPAL & GT3X+, fasting blood, questionnaire
- Cost-effectiveness analysis



Dunstan et al. *BMC Public Health* 2013, **13**:1057  
<http://www.biomedcentral.com/1471-2458/13/1057>



STUDY PROTOCOL

Open Access

## Reducing office workers' sitting time: rationale and study design for the *Stand Up Victoria* cluster randomized trial

David W Dunstan<sup>1,2,3,4,5,6\*</sup>, Glen Wiesner<sup>1</sup>, Elizabeth G Eakin<sup>1</sup>, Maïke Neuhaus<sup>2</sup>, Neville Owen<sup>1</sup>, Anthony D LaMontagne<sup>5</sup>, Marj Moodie<sup>1</sup>, Elisabeth AH Winkler<sup>1</sup>, Brianna S Fieldsoe<sup>2</sup>, Sheleigh Lawler<sup>1</sup> and Genevieve N Healy<sup>1,2,8†</sup>

### Abstract

**Background:** Excessive time spent in sedentary behaviours (sitting or lying with low energy expenditure) is associated with an increased risk for type 2 diabetes, cardiovascular disease and some cancers. Desk-based office workers typically accumulate high amounts of daily sitting time, often in prolonged unbroken bouts. The *Stand Up Victoria* study aims to determine whether a 3-month multi-component intervention in the office setting reduces workplace sitting, particularly prolonged, unbroken sitting time, and results in improvements in cardio-metabolic biomarkers and work-related outcomes, compared to usual practice.

**Methods/Design:** A two-arm cluster-randomized controlled trial (RCT), with worksites as the unit of randomization, will be conducted in 16 worksites located in Victoria, Australia. Work units from one organisation (Department of Human Services, Australian Government) will be allocated to either the multi-component intervention (organisational, environmental [height-adjustable workstations], and individual behavioural strategies) or to a usual practice control group. The recruitment target is 160 participants (office-based workers aged 18–65 years and working at least 0.6 full time equivalent per arm). At each assessment (0 [baseline], 3 [post intervention], and 12-months [follow-up]), objective measurement via the activPAL3 activity monitor will be used to assess workplace sitting time (primary outcome); prolonged sitting time (sitting time accrued in bouts of ≥30 minutes); standing time; sit-to-stand transitions; and, moving time. Additional outcomes assessed will include: non-workplace activity; cardio-metabolic biomarkers and health indicators (including fasting glucose, lipids and insulin; anthropometric measures; blood pressure; and, musculoskeletal symptoms) and, work-related outcomes (presenteeism, absenteeism, productivity, work performance). Incremental cost-effectiveness and identification of both workplace and individual-level mediators and moderators of change will also be evaluated.

**Discussion:** *Stand Up Victoria* will be the first cluster-RCT to evaluate the effectiveness of a multi-component intervention aimed at reducing prolonged workplace sitting in office workers. Strengths include the objective measurement of activity and assessment of the intervention on markers of cardio-metabolic health. Health- and work-related benefits, as well as the cost-effectiveness of the intervention, will help to inform future occupational practice.

**Trial registration:** ACTRN1211000742976

**Keywords:** Sedentary behaviour, Workplace, Randomised intervention, Office workers, Cardio-metabolic biomarkers, Activity permissive desks, Accelerometry, Physical activity

CIs: David Dunstan, Genevieve Healy, Neville Owen, Elizabeth Eakin, Anthony LaMontagne, Marj Moodie

The specific aims of *Stand Up Victoria* were to:

- **Evaluate the effectiveness of a multi-component workplace intervention on workplace sitting time** (primary outcome);
- **Determine the impact of the intervention on other activity outcomes** (prolonged sitting, standing and stepping at work; sitting, standing and stepping across the whole day)
- Determine the impact of the intervention on health- and work-related outcomes;
- Identify the factors that mediate and moderate intervention impacts;
- Assess intervention cost-effectiveness; and,
- Evaluate the acceptability of the intervention, and the barriers and facilitators of change.

# Stand Up Victoria – Partner Organisation



- Geographically separate sites (>1km)
- Metropolitan & regional
- Not currently delivering a physical activity intervention
- Desk based work





# Measures

Behaviour / cost effectiveness	Health	Work / environment
<ul style="list-style-type: none"> <li>Sitting, standing, moving time</li> <li>Postural transitions</li> <li>MVPA</li> </ul>	Anthropometric <ul style="list-style-type: none"> <li>Height, weight, waist circumference</li> <li>Body composition (% fat, fat-free mass)</li> </ul>	<ul style="list-style-type: none"> <li>Productivity</li> <li>Presenteeism</li> <li>Absenteeism</li> <li>Work performance</li> </ul>
Diet, smoking	Cardio-metabolic <ul style="list-style-type: none"> <li>Glucose, cholesterol, triglycerides, insulin*</li> <li>Blood pressure</li> </ul>	<ul style="list-style-type: none"> <li>Work environment</li> <li>Workstation utilisation &amp; acceptability</li> </ul>
Health related quality of life	Musculoskeletal	<ul style="list-style-type: none"> <li>Preferences, strategies, perceived norms</li> </ul>
Health care utilisation	Stress-related symptoms, eyestrain	Employment status
Adverse events	Health history	

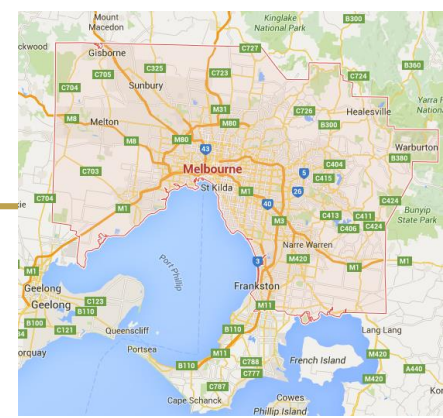
 Ergonomic outcomes

 Public health outcomes

# Who was involved?

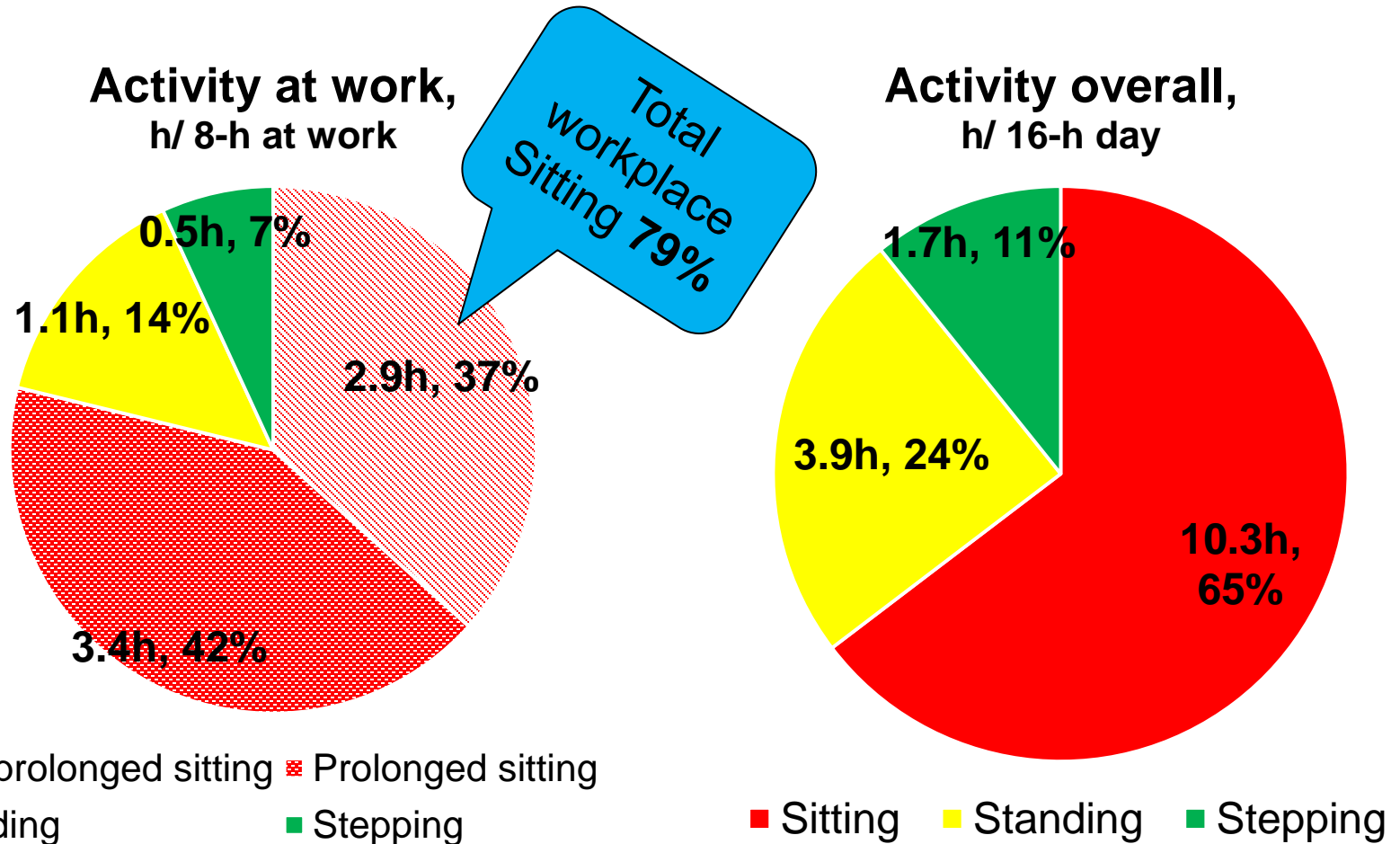
---

- 14 worksites, 231 participants
  - 136 intervention; 95 control
- 5 sites large (>200 employees), 6 medium (50-200 employees), 3 small (<50 employees).
- 4 phone based, 7 non-phone based, 3 mixed
- Aged 24 to 65 years, 68% female
- Broadly representative of Victorian DHS employees



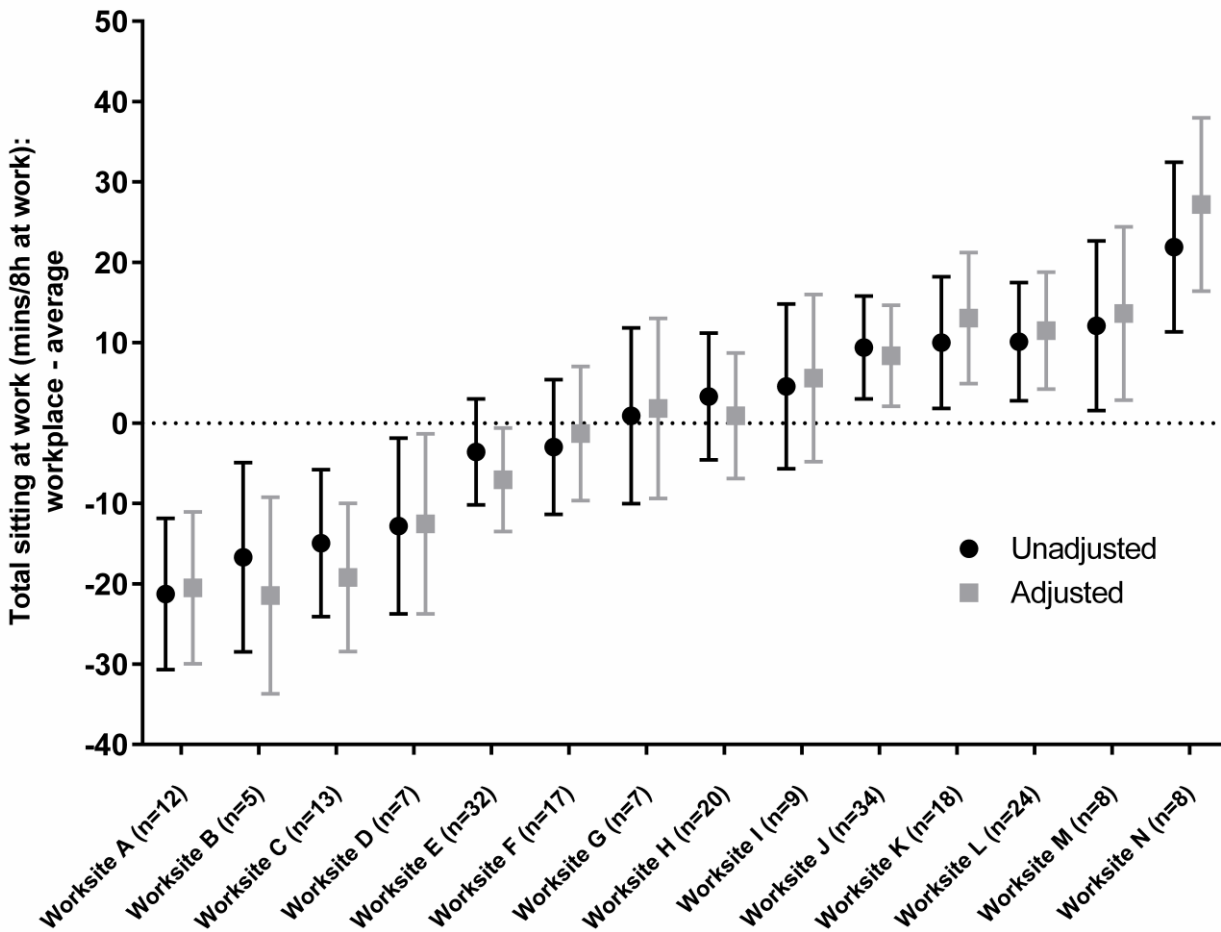
# Baseline activity

---



# Variation in sitting time between sites

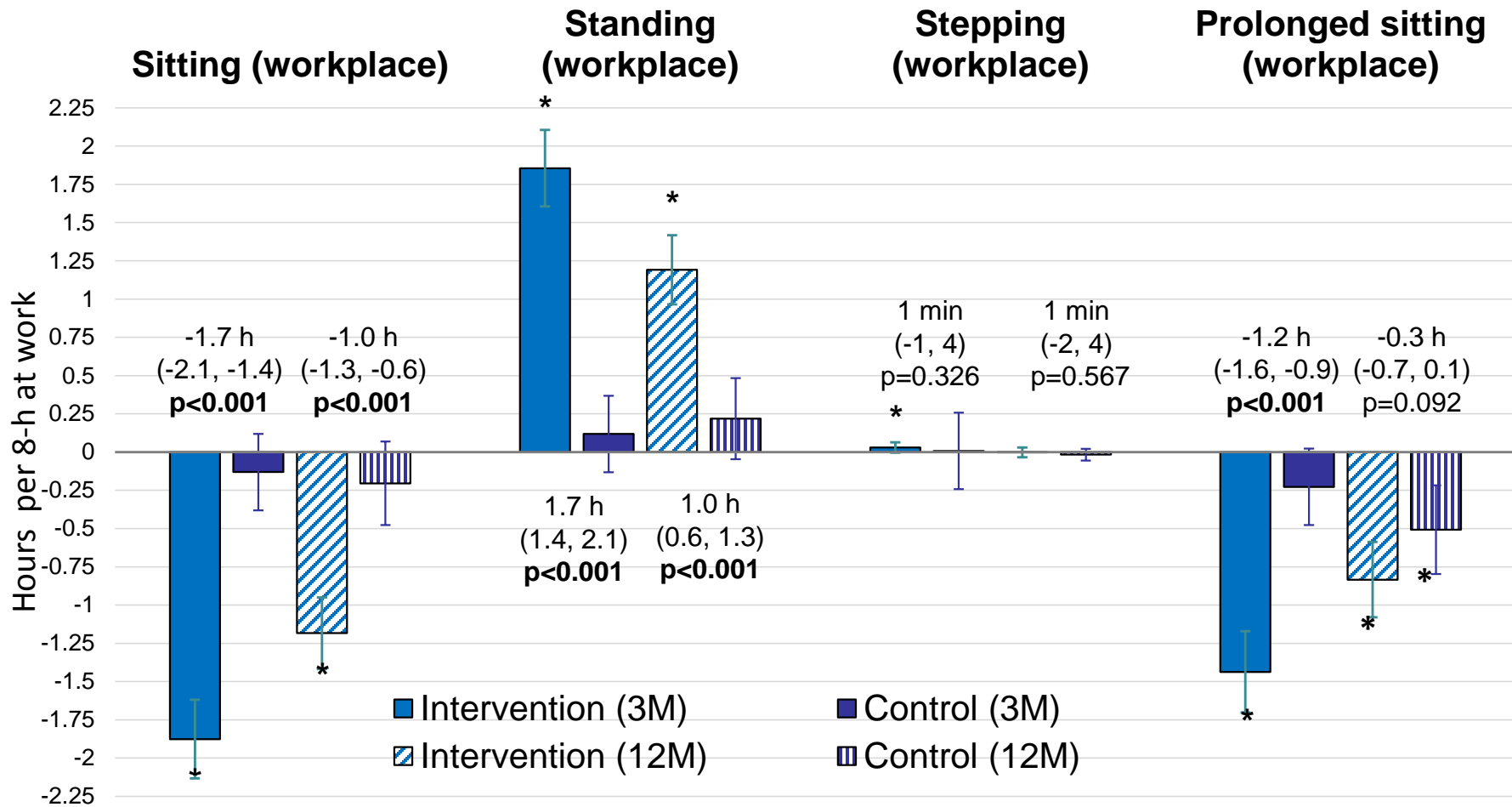
Total sitting time at work: variation between worksites



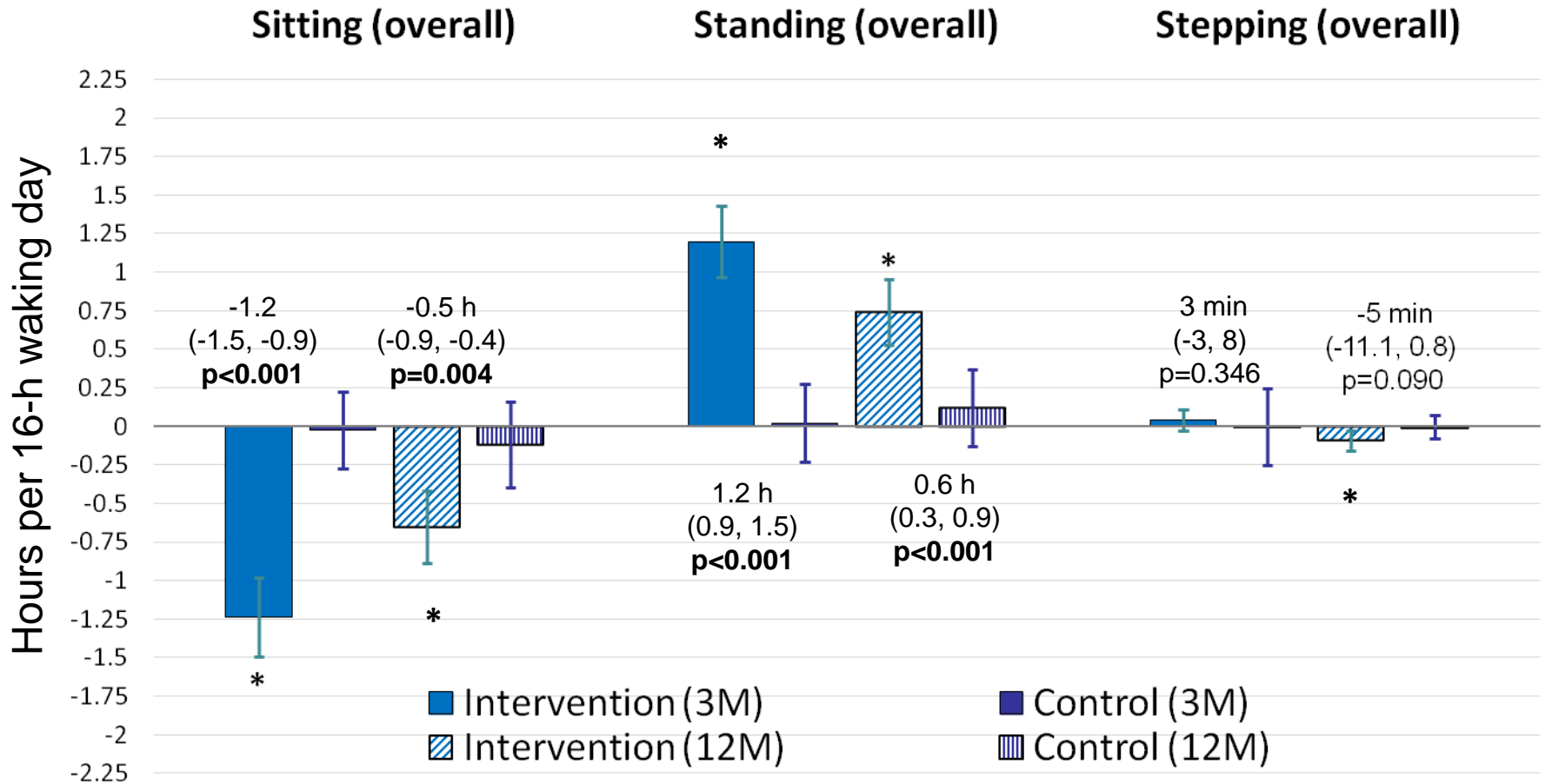
~ 40 mins  
variation between  
lowest & highest  
sitting sites



- Unadjusted
- Adjusted for age, gender, marital status, BMI

# Change at the workplace



# Change across the day (work & non work)



- Evaluate the effectiveness of a multi-component workplace intervention on workplace sitting time (primary outcome); 
- Determine the impact of the intervention on other activity outcomes (prolonged sitting, standing and stepping at work; sitting, standing and stepping across the whole day) 
- Determine the impact of the intervention on health- and work-related outcomes;
- Identify the factors that mediate and moderate intervention impacts;
- Assess intervention cost-effectiveness; and,
- Evaluate the acceptability of the intervention, and the barriers and facilitators of change.



# What did staff say?

---

*I thought it was good. I enjoyed it....  
When it was over was probably  
when I realised how much I did  
enjoy it. .... (it) made the day go  
faster. And I felt better for it.*

*I found that you didn't realise how  
much you actually did sit down in  
one sitting.... When you sit down  
you get really sluggish and stiff but  
when you stand you are freer and  
loose and able to concentrate  
more.... You feel fresher.*

*The amount of desk space has  
been reduced too much which  
impacts on the functionality and  
ease of use of our workspace*

*.... enabled us to have a bit more  
energy throughout the day. Instead  
of getting the sitting slump, you're  
able to actually move and I find you  
actually get more energy by doing  
that, by moving more regularly and  
being able to alternate between sit  
and stand*

---



# Where to next?

From Research to Reality – Evidence based translation



**Reducing  
prolonged sitting  
in the workplace**

An evidence review: summary report

[www.vichealth.vic.gov.au](http://www.vichealth.vic.gov.au)



Australia



# BeUpstanding Toolkit™

---



- Free online web based toolkit
  - Designed as a comprehensive resource for the Workplace Champion
- 
- Provides background evidence, program messages and strategies of the BeUpstanding Program™

**Find out more about the toolkit in the next session**

**2pm to 3pm – New Toolkits for workplaces**

---

# Key messages

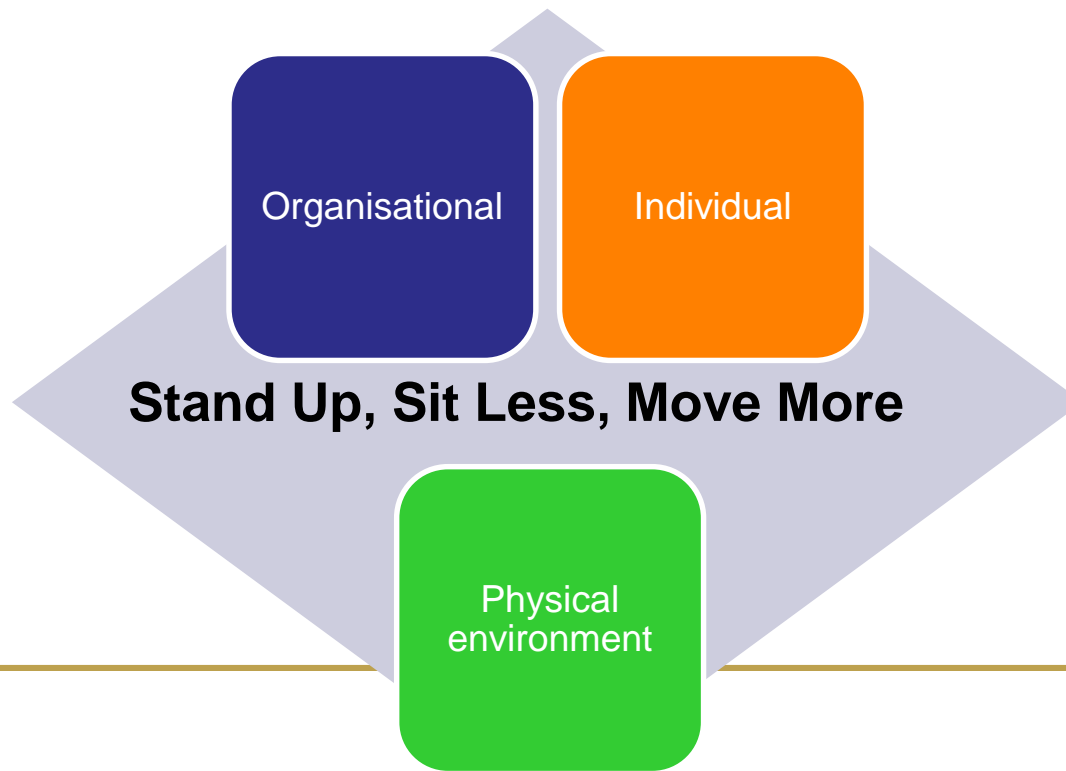
---

- **Cluster-RCT** evaluating multi-component approach to reducing workplace sitting
    - Intervention systematically developed
  - Intervention was **acceptable & effective**
  - Designed with **consideration for scale-up & dissemination**
    - Currently being developed & evaluated
-

# Recommendations

---

- **Physical environment** key for sustainable change, but needs to be underpinned by **relevant policies**, **raising awareness**, & building a **supportive culture**



# Thank you for listening

---

## Acknowledgements

Investigators, participants & project staff

Funding bodies: VicHealth, NHMRC

**Particular thanks:** Prof David Dunstan, Prof Elizabeth Eakin, Prof Anthony LaMontagne, Prof Neville Owen, Prof Marj Moodie, Dr Glen Wiesner, Dr Elisabeth Winkler, Lisa Willenberg

## Contact Details

**Dr Genevieve Healy**

The University of Queensland, Brisbane, Australia

[g.healy@uq.edu.au](mailto:g.healy@uq.edu.au)

