

## Interventions with potential to reduce sedentary time in adults: Evidence and implications for public health

### Review on which this evidence summary is based:

Martin A, Fitzsimons C, Jepson R, Saunders D, van der Ploeg HP, Teixeira PJ, et al. (2015). **Interventions with potential to reduce sedentary time in adults: Systematic review and meta-analysis.** *British Journal of Sports Medicine*, 0, 1-10.

### Review Focus

- P** Adults aged 18 years or more who have left school
- I** Any intervention which included a sedentary behaviour (SB) outcome measure in free-living adults
- C** No intervention, waiting list, attention control, usual care, and alternative treatment
- O** *Primary Outcomes:* SB, proxy measures of SB and patterns of accumulation of SB  
*Secondary Outcomes:* cardiometabolic health, mental health and body composition

### Review Quality Rating:

9 (strong) *Details on the methodological quality are available [here](#).*

### Considerations for Public Health Practice

#### Conclusions from Health Evidence

This high-quality systematic review is based on 51 studies (44 were randomized control trials (RCTs) and 7 were cluster RCTs). Most included studies were low or unclear risk of bias. 34 studies were included in the meta-analysis.

#### Primary Outcomes:

- Lifestyle interventions (including a combination of physical activity, sedentary behaviour, and dietary/nutrition components) and SB-only interventions reduce SB in healthy adults
- Combined physical activity and sedentary behaviour and PA-only interventions are not effective to reduce SB in adults
- Combined PA/SB interventions 3-6 months and PA-only interventions longer than 6 months increase SB in adults
- Intervention duration up to 3 months or shorter and those targeting men and mixed genders produce significant reductions in SB

#### Secondary Outcomes:

- Some PA-only and lifestyle interventions reported on cardiometabolic risk factors, body composition and mental health outcomes. The majority of these studies did not show a reduction in SB so it is unclear if these reported intervention effects are

#### General Implications

Public health should focus on implementing lifestyle and SB-only interventions that are 3 months or shorter to reduce SB in healthy adults.

Public health should not implement PA-only and PA/SB interventions of any duration as they do not effectively reduce SB.

There is currently no evidence that PA/SB interventions longer than 6 months, or SB only longer than 3 months are effective in changing SB, and therefore are not recommended without further evaluation.

Further research is needed to determine if effective interventions for reducing SB result in clinically meaningful and sustained improvements in health outcomes.

due to a reduction in SB. Therefore it was not possible to determine the effect of reduced SB on these outcomes.

## Evidence and Implications

### What's the evidence?

### Implications for practice and policy

**1. Lifestyle interventions (including a combination of physical activity, sedentary behaviour, and dietary/nutrition components) reduce SB in adults by about 25 mins/day** (95% CI -40.66 to -7.70; 20 studies; 3981 participants; moderate quality evidence)

**1. Lifestyle Interventions**

- **Duration ≤3 months**

- Lifestyle interventions **reduce** SB by 97.75 min/day (95% CI -121.88 to -73.61; 5 studies; 297 participants; high quality evidence)

- **Duration 3-6 months**

- Lifestyle interventions have **no effect** on SB (-8.42 min/day 95% CI -19.05 to 2.21; 7 studies; 1664 participants; moderate quality evidence)

- **Duration >6 months**

- Lifestyle interventions have **no effect** on SB (-3.99 min/day 95% CI -21.93 to 13.96; 8 studies; 2040 participants; moderate quality evidence)

- Public health should consider implementing lifestyle interventions (including a combination of physical activity, sedentary behaviour, and dietary/nutrition components) 3 months or shorter as there is compelling evidence that such interventions reduce sedentary behaviour in adults.

- Public health should be cautious implementing lifestyle interventions longer than 3 months to reduce SB in adults as there is no evidence of effectiveness.

**2. PA/SB interventions have no effect on SB in adults** (-32 .51 min/day 95% CI -106.52 to 41.50; 4 studies; 471 participants; moderate quality evidence)

**2. PA/SB Interventions**

- **Duration ≤3 months**

- Combined PA/SB interventions have **no effect** on SB (-54.69 min/day 95% CI -166.60 to 57.22; 3 studies; 214 participants; very low quality evidence)

- **Duration 3-6 months**

- Combined PA/SB interventions **increase** SB by 23.60 min/day (95% CI 0.78 to 46.42; 1 study; 257 participants; moderate quality evidence)

- **Duration >6 months**

- There was no evidence available for this intervention duration.

- Public health should not implement combined PA/SB interventions in healthy adults to reduce SB.

- Intervention durations of 3-6 months in fact increase SB in adults, while there is no evidence available for intervention durations longer than 6 months.

**3. PA interventions have no effect on SB in adults** (-6.08 min/day 95% CI -38.00 to 25.84; 8 studies; 1354 participants; moderate quality evidence)

**3. PA Interventions**

- **Duration ≤3 months**

- PA interventions have **no effect** on SB (-10.43 min/day 95% CI -49.85 to 28.98; 5 studies; 935 participants; moderate quality evidence)

- **Duration 3-6 months**

- PA interventions have **no effect** on SB (-21.52 min/day 95% CI -103.55 to 60.51; 2 studies; 184 participants; moderate quality evidence)

- Public health should not implement PA-only interventions of any duration for reducing SB as they do not effectively reduce SB in adults. PA-only interventions longer than 6 months in fact increase SB in healthy adults.

<ul style="list-style-type: none"> <li>● <b>Duration &gt;6 months</b> <ul style="list-style-type: none"> <li>● PA interventions <b>increase</b> SB by 48.60 min/day (95% CI 1.66 to 95.54; 1 study; 235 participants; moderate quality evidence)</li> </ul> </li> </ul>	
<p><b>4. SB interventions reduce SB in adults by about 42 mins/day</b> (95% CI -78.92 to -4.60; 2 studies; 62 participants; low quality evidence)</p> <ul style="list-style-type: none"> <li>● <b>Duration ≤3 months</b> <ul style="list-style-type: none"> <li>● SB interventions <b>reduce</b> SB by 41.76 min/day (95% CI -78.92 to -4.60; 2 studies; 62 participants; low quality evidence)</li> </ul> </li> <li>● <b>Duration 3-6 months</b> <ul style="list-style-type: none"> <li>● There is no evidence available for this intervention duration.</li> </ul> </li> <li>● <b>Duration &gt;6 months</b> <ul style="list-style-type: none"> <li>● There is no evidence available for this intervention duration.</li> </ul> </li> </ul>	<p><b>4. SB Interventions</b></p> <ul style="list-style-type: none"> <li>● Public health should consider implementing SB-only interventions that are less than 3 months duration for reducing SB in adults.</li> <li>● Public health should be cautious implementing SB-only interventions that are 3 months or longer as there is currently no evidence of effectiveness on SB.</li> </ul>
<p><b>Legend:</b> P – Population; I – Intervention; C – Comparison group; O – Outcomes; RCT – Randomized Control Trials, CI – Confidence Interval; MD – Mean Differences  **For definitions see the <a href="http://www.healthevidence.org/glossary.aspx">healthevidence.org</a> glossary at <a href="http://www.healthevidence.org/glossary.aspx">http://www.healthevidence.org/glossary.aspx</a></p>	

### Why this issue is of interest to public health:

Extended periods of time spent sedentary is a growing public health concern. In 2013 Canadian adults aged 18-79 years spent an average 9.8 hours/day sedentary.<sup>1</sup> In adults, sedentary behaviour is associated with increases in weight gain, chronic inflammation, cardiovascular disease, type 2 diabetes, metabolic syndrome, and all-cause mortality.<sup>2,3</sup> Time spent sedentary is also linked to an increase in the risk for developing cancer. Furthermore, current research shows that there is a dose-response relationship between sitting time and negative health outcomes independent of leisure time physical activity.<sup>3,4</sup> Due to the increased health concerns as a result of increased sedentary time, it is important for public health to consider interventions to reduce sedentary behaviour.

1. Statistics Canada. (2015). *Average time spent sedentary, household population by sex and age group*. Retrieved from <http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1170020&pattern=&csid=>
2. De Rezende, L.F., Lopes, M.R., Rey-López, V., Matsudo, R., & do Carmo Luiz, O. (2014). Sedentary Behavior and Health Outcomes: An Overview of Systematic Reviews. *PLoS One*, 9(8), 1-7. doi: 10.1371/journal.pone.0105620
3. Canadian Cancer Society. (2016). *Sedentary Behaviour*. Retrieved from [http://www.cancer.ca/en/cancer-information/cancer-101/what-is-a-risk-factor/sedentary-behaviour/?region=on#Risk\\_factor\\_and\\_cancer](http://www.cancer.ca/en/cancer-information/cancer-101/what-is-a-risk-factor/sedentary-behaviour/?region=on#Risk_factor_and_cancer)
4. Katzmarzyk, P.T., Church, T.S., Craig, C.L., & Bouchard, C. (2009). Sitting Time and Mortality from All Causes, Cardiovascular Disease, and Cancer. *Medicine & Science in Sports & Exercise*, 41(5), 998-1005. doi: 10.1249/MSS.0b013e3181930355

Other quality reviews on this topic are available on [www.healthevidence.org](http://www.healthevidence.org).

### Suggested citation:

Cino, C., Dobbins, M. (2016). Interventions with potential to reduce sedentary time in adults: Evidence and implications for public health. Hamilton, ON: McMaster University. Retrieved from [http://www.healthevidence.org/documents/byid/28660/Martin2015\\_EvidenceSummary\\_EN.pdf](http://www.healthevidence.org/documents/byid/28660/Martin2015_EvidenceSummary_EN.pdf)

*This evidence summary was written to condense the work of the authors of the review referenced on page one. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.*

*The opinion and ideas contained in this document are those of the evidence summary author(s) and healthevidence.org. They do not necessarily reflect or represent the views of the author's employer or other contracting organizations. Links from this site to other sites are presented as a convenience to healthevidence.org internet users. Healthevidence.org does not endorse nor accept any responsibility for the content found at these sites.*