Sit–Stand Desks – Are they worth it?

James Allan
Sedentary Behaviour

‘Any waking behaviour characterised by an energy expenditure of less than 1.5 Metabolic Equivalent of Task while in a sitting or reclining position.’
# Metabolic Equivalent of Task

<table>
<thead>
<tr>
<th>Physical Activity</th>
<th>MET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleeping</td>
<td>0.9</td>
</tr>
<tr>
<td>Watching television</td>
<td>1.0</td>
</tr>
<tr>
<td>Writing, desk work, typing</td>
<td>1.5</td>
</tr>
<tr>
<td>Walking (2.7 km/h)</td>
<td>2.3</td>
</tr>
<tr>
<td>Walking (4 km/h)</td>
<td>2.9</td>
</tr>
<tr>
<td>Bicycling (Stationary 50 Watts)</td>
<td>3.0</td>
</tr>
<tr>
<td>Walking (4.8 km/h)</td>
<td>3.3</td>
</tr>
<tr>
<td>Walking (5.5 km/h)</td>
<td>3.6</td>
</tr>
<tr>
<td>Bicycling (Stationary 100 Watts)</td>
<td>5.5</td>
</tr>
<tr>
<td>Jogging (General)</td>
<td>7.0</td>
</tr>
<tr>
<td>Jogging (9.0 km/h)</td>
<td>8.8</td>
</tr>
<tr>
<td>Jogging (11.0 km/h)</td>
<td>11.2</td>
</tr>
</tbody>
</table>
Compared to sitting less than 6 hours a day, sitting for 10 hours a day or more per day was found to be associated with a 38% higher risk of a heart attack and 31% higher risk of all-cause mortality.
Human Evolution
Look how far we’ve come!
Are they real?
Where to next?
Sitting is the New Smoking

When you think of something that could threaten your life, you probably don’t think about your chair at work. But according to many researchers, it’s one of the biggest potential threats to your health.

Research shows that you can reduce your chances of cancer, type 2 diabetes, cardiovascular disease, and back pain, all with one simple lifestyle change: reduce the time you spend sitting.

“Sitting is more dangerous than smoking, kills more people than HIV, and is more treacherous than parachuting. We are sitting ourselves to death,” says James Levine, a professor of medicine at the Mayo Clinic, in an interview with the LA Times. “The chair is out to kill us.”

You may have heard the saying, “sitting is the new smoking,” which is credited to Dr. Levine. He’s not the only one who believes that we’re sitting ourselves to death. There’s a growing body of research that supports his claim and the benefits of standing desks.

“We weren’t designed to sit,” claims Dr. Joan Vernikos, former director of NASA’s Life Sciences Division and author of the “Sitting Kills, Moving Heals”. “The body is a perpetual motion machine.”

Don’t fall off your perch, but sitting is the new smoking and your chair is out to kill you. No, really. This is the sorry state of affairs thanks to our increasingly seated existence, said doctors in an LA Times feature published earlier this week.

As evidence, the doctors pointed out various studies, including this Australian one from last year which found that every hour of (seated) TV watching we do cuts about 22 minutes from our lifespan. That was contrasted with this study, which estimated that smokers shorten their lives by about 11 minutes per cigarette.
Sit–Stand Study

The Objective:

‘To determine the effectiveness of a computer-based intervention designed to increase sit–stand desk usage and help reverse physical activity.’
Advanced Settings

Last 7 days

Computer use
33:34 hours
40 hours
Micropause compliance
75%

Mouse use
19:53 hours
40 hours
WorkSpace Break compliance
30%

Current Settings:
Quiet mode (no alerts)

Micropauses
After using your computer continuously for: 3:35 mins
You will get a Micropause for:
Enforcement Level:

WorkSpace Break
After using your computer continuously for: 1:00 hour
You will get a WorkSpace Break for:
Enforcement Level:

Daily Usage Limit
After actively using your computer for: 6:00 hours
Enforcement Level:

Exercises
Exercises per WorkSpace Break: 3

Learn your keyboard shortcuts
Check spelling F7

Ergonomic Tip
Try and organise your work so you can change your posture frequently between tasks
Work Intensity

Break Compliance
# Overall Risk

Your assessment shows an Overall **High Risk** for RSI, with 12 recommendations.

Click on each Risk Category or recommendation for advice on reducing your risk.

You are strongly advised to implement the recommendations in the High and Medium risk categories **as soon as possible**. Please contact your manager or Health and Safety Manager for assistance with this.

# Risk Profile and Recommendations

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Risk Level</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Use</td>
<td>High Risk</td>
<td>- You have high computer use. Avoid unnecessary computer work.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- If possible try to avoid working at the computer for more than 6 hours per day.</td>
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<tr>
<td></td>
<td></td>
<td>- Re-run the WorkPace Setup Wizard.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- You have high mouse use. Aim for <strong>less than 15 hours a week</strong>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Reduce your mouse use by learning keyboard shortcuts.</td>
</tr>
<tr>
<td>Speed &amp; Intensity</td>
<td>Medium Risk</td>
<td>- You have a very high level of mouse clicking. See if you can reduce the number of mouse clicks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Reduce your mouse use by learning keyboard shortcuts.</td>
</tr>
<tr>
<td>Breaks</td>
<td>High Risk</td>
<td>- Improve your Micropause Compliance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Improve your WorkPace Break Compliance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Avoid working very long days at the computer.</td>
</tr>
<tr>
<td>Posture &amp; Workstation</td>
<td>Medium Risk</td>
<td>- Support your arm on your chair’s arm rest when using the mouse.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Shift your mouse closer to your keyboard.</td>
</tr>
<tr>
<td>Discomfort</td>
<td>Low Risk</td>
<td>None</td>
</tr>
</tbody>
</table>
Eligibility Criteria

- At least > 20 hours active computer use

- > 5 work days per employee (equivalent to 1 work week)

- Inactive computer use
  - > 30 seconds during which there was no keyboard or mouse use.
Eligibility for Study

- ~624 employees
- ~194 users with sufficient valid data for analysis

  - Employees excluded because joined study too late or left too early ($\leq 20$ hrs or $\leq 5$ days data recorded before and after intervention)

  - Employees users excluded due to $>15\%$ missing data (e.g. cable not connected, using laptop without sit-stand workstation, etc)
Study Stages

- Baseline Recording
  - 3 months
  - Monitored current usage, no prompts

- Post Intervention (2 phases)
  - 9 months
  - Prompts turned on
  - Reminders set for 30 minutes of sitting and 20 minutes of standing
Results

![Graph showing mean ACU hours per work day over months from November 2016 to November 2017, with two lines indicating Sit-ACU and Stand-ACU. The graph shows a slight increase in mean hours for Sit-ACU compared to Stand-ACU.]
Results

Mean Desk Position Changes Per Work Day

Month

Nov-16  Dec-16  Jan-17  Feb-17  Mar-17  Apr-17  May-17  Jun-17  Jul-17  Aug-17  Sep-17  Oct-17  Nov-17
Results

Frequency of desk position changes

- Baseline
- Intervention

Percent of Participants

- ≥3 times a day: 10%
- 1-2 times a day: 15%
- Once a day: 16%
- 2-3 times a week: 24%
- Once a week: 21%
- Once a month: 13%
- Never: 15%
- Once a month: 8%
- Never: 6%
- Never: 5%
- Never: 4%

Results

Mean Time Between Desk Position Changes
(ACU Hours)

Month

Nov-16  Dec-16  Jan-17  Feb-17  Mar-17  Apr-17  May-17  Jun-17  Jul-17  Aug-17  Sep-17  Oct-17  Nov-17
Results

Percent of computer use time when desk was in a standing position

- Baseline
- Intervention
How helpful did you find the Wellnomics sit stand software in using your sit stand desk?

- Very or Somewhat helpful: 80%
- No opinion: 9%
- Unhelpful or Very unhelpful: 11%
Did you spend more time in standing at your workstation each day once the software started reminding you?

- More time standing: 70%
- No change: 24%
- Less time standing: 7%
Since using the sit stand software have you noticed any changes in the following while at work?

- **Higher**
  - Mental alertness: 20%
  - Fatigue: 3%
  - Discomfort: 5%

- **No change**
  - Mental alertness: 66%
  - Fatigue: 68%
  - Discomfort: 63%

- **Lower**
  - Mental alertness: 14%
  - Fatigue: 29%
  - Discomfort: 33%
What were the biggest benefits of using the sit stand software (if any)?

“*I had more energy and I felt healthier*”

“*Keeps you moving - less likely to feel sluggish*”

“*Reminding me that I need to move, rather than getting me to stand at my desk*”

“*good tool to remind me to stand!*”

“*I no longer have lower back pain as I am standing more often*”

“*Encourages me to stand more often*”

“*The software does the thinking for me :)*”
What were the biggest drawbacks (if any)

“None”

“Constant arrows. Feel pressured to stand up to get rid of them”

“The red arrow getting angry if you don’t move in time...”

“Appreciate the limitations but it doesn’t account for the time I spend at my desk reading”

“Initial discomfort in legs and hips due to not being used to standing for long periods of time”

“The height not aligning when I have high heels on”

“Sometimes the prompt came up at an inconvenient time”
What did you MOST like about the sit–stand software – its behaviour, user interface and features, and why?

“*The reminders and ease of use (arrow key to raise desk)*”

“*Changing posture and position. Arrows were annoying but got used to it.*”

“*endorse the program. great initiative.*”

“*user interface simple*”

“*That you can ignore it or turn it off if you need to*”

“*Flexibility to set up specific to user’s needs*”

“*That it was so simple - arrow up, arrow down, nothing in between. It didn’t bother or distract me.*”
What did you LEAST like about it?

“Nothing”

“It doesn’t take into account time away from the desk - need to be able to tell it if just spent an hour sitting in a meeting or walking around at lunch.”

“Arrows were annoying but got used to it.”

“Standing and typing documents do not work efficiently. Typing is slower when standing at least for me”

“those damn arrows flashing red”

“Initially the reminders were way too often and distracted from work and productivity”

“The constant reminders to stand when I did not want to”
Key Points

- Study accounted for time employees spent away from computer
- Software prompts are an effective way to increase usage
- Research can be used to create further sustainable interventions.
Implications for Advisors

- Perform a Risk Assessment
- Provide training and instruction to employees
- Consider purchasing a software solution with the introduction of sit-stand desks.