

INTRODUCTION

There is widespread interest in the association between time spent sitting (sedentary behavior) and health outcomes, such as diabetes, cardiovascular disease, some cancers, and premature mortality. People who sit in prolonged static postures at work (that is, more than 80% of the day and continuously for more than two hours at a time) have taken notice, and there is growing interest to improve the traditional office/desk work environment to reduce sedentary behaviors. As a result, a dizzying amount of new research, recommendations, and different equipment and furniture options are available (such as adjustable sit-stand workstations and active treadmill or bicycle workstations) to help reduce the negative health consequences of prolonged static sitting. However, it is confusing to try and understand what information is accurate and reliable research, versus what is recent or new opinion. This statement provides background for Humantech's position on the practice of prolonged static sitting at work.

Humantech's position is that prolonged static sitting and prolonged static standing at work should be avoided. Prolonged static sitting and standing should be minimized through the use of "movement-promoting" workplace designs and equipment and furniture options. We recommend that people transition regularly among sitting, standing, and walking throughout the work day.

SEDENTARY BEHAVIOR AT WORK

For the context of this position statement, sedentary behavior is defined as time spent sitting. In the general population, sedentary behavior occupies approximately 55% of our waking hours or about 7.7 hours per day. People whose work requires intensive computer use (computer programmers, designers, and call center employees) spend up to 80% of their work days sitting. People whose work requires regular computer use spend 65-75% of their work day sitting; more than 50% of this time is spent in prolonged periods of static sitting.

NEGATIVE HEALTH OUTCOMES OF PROLONGED STATIC SITTING

Research demonstrates an association between the amount of time people spend sitting and their risk of diabetes, obesity, cardiovascular disease, some cancers, and premature mortality. For example, those who sit for the majority of the day (more than 80% of the day) and for extended periods (2 hours or more at one time) have twice the risk of type 2 diabetes and cardiovascular disease, a 13% increased risk of cancer incidence, and a 17% increased risk of mortality. For every additional hour of sedentary behavior per day, there is a 10% higher risk of developing type 2 diabetes, a 7.5% higher risk of developing cardiovascular disease, and a 5% increase in risk of premature mortality.

In addition, sitting has been identified as one of the major risk factors for developing low back pain for many years. Surprisingly, however, research now shows that prolonged static sitting alone is not associated with low back pain, but prolonged static sitting, with the additional presence of awkward postures, is.

IMPACT OF DISRUPTING PROLONGED STATIC SITTING AND STANDING AT WORK

As a result of the negative health outcomes and musculoskeletal disorders (MSDs) associated with prolonged static sitting at work, several changes to the traditional work environment have been implemented to reduce sedentary behaviors. Initially, there was a trend to simply replace time seated with time standing. Unfortunately, prolonged static standing is associated with similar negative health outcomes, including cardiovascular system changes (carotid atherosclerosis and varicose veins), lower limb discomfort, and low back pain. Simply changing the work posture from prolonged static sitting to prolonged static standing does not improve health or MSD outcomes.

More recently, the use of “movement-promoting” workplace designs and equipment/furniture options have been implemented. Adjustable sit-stand workstations and active treadmill or bicycle workstations have been shown to reduce sedentary behavior and to slow the negative health outcomes of prolonged static standing. Sit-stand workstations seem to be associated with nominal physiological benefit, reduced musculoskeletal discomfort, and less low back pain. They also have no negative impact on task performance. Active workstations such as treadmill or bicycle workstations appear to be linked with meaningful, positive physiological outcomes. Active workstations can reduce low back pain, but they are sometimes associated with lower limb discomfort and they tend to slightly reduce task performance.

GUIDELINES TO OPTIMIZE WELL-BEING AT WORK

Our recommendations to optimize well-being at work:

- Limit prolonged static sitting to 2 hours at one time.
- Limit static (constrained) standing to 15 minutes at one time.
- Transition regularly among sitting, standing, and walking throughout the work day. Transition prior to feeling pain or discomfort.
- Strive for a 1:1 ratio between seated work and non-seated work (walking, standing, and noticeable movement) throughout the day. For an 8-hour work day, this equates to 4 hours of seated work and 4 hours of non-seated work.
- Start with accumulating at least 2 hours non-seated work throughout the work day. Then transition toward a total accumulation of 4 hours.
- Limit average sitting time to 9 hours (≤ 6 hours at work and ≤ 3 hours at home) per day.

CONCLUSION

Sitting or standing in a static posture for a prolonged period of time can have negative effects on health and comfort. Design work tasks and work spaces that promote regular changes in posture and movement.

ENDORSEMENT

This position statement was accepted by Humantech's Senior Leadership on October 24th, 2016.

REFERENCES

Benatti, F.B. and Ried-Larsen, M. (2015). *The Effects of Breaking up Prolonged Sitting Time: A Review of Experimental Studies*. Med Sci Sports Exerc., ct;47(10):2053-61.

Buckley, J.P., Hedge, A., Yates, T., Copeland, R.J., Loosemore, M., Hamer, M., Bradley, G., and Dunstan, D.W. (2015). *The sedentary office: an expert statement on the growing case for change towards better health and productivity*. Br J Sports Med., Nov;49(21):1357-62.

Callaghan, J.P., De Carvalho, D.D., Gallagher, K., Karaholis, T., and Nelson-Wong, E. (2015). *Is standing the solution to sedentary office work?* Ergonomics in Design, July, 20-24.

Davis, K.G. and Kotowski, S.E. (2015). *Stand up and move; your musculoskeletal health depends on it*. Ergonomics in Design, July, 9-13.

Hysmans, M.A., van der Ploeg, H.P., Proper, K.I., Spekle, E.M., and van der Beek, A.J. (2015). *Is sitting too much bad for your health?* Ergonomics in Design, July, 4-8.

MacEwan, B.T., MacDonald, D.J., and Burr, J.F. (2015). *A systematic review of standing and treadmill desks in the workplace*. Preventative Medicine, 70, 50-58.

Toomingas, A., Forsman, M., Mathiassen, S.E., Heiden, M., and Nilsson, T. (2012). *Variations between seated and standing/walking postures among male and female call centre operations*. BMC Public Health, Mar 2;12:154.

Water, T.R., and Dick, R.B. (2014). *Evidence of health risks associated with prolonged standing at work and intervention effectiveness*. Rehabilitation Nursing, May-Jun;40(3):148-65.