

Replace Sitting With Standing to Improve Cardiometabolic Risk Factors, Say Researchers

Michael O'Riordan | August 13, 2015

BRISBANE, AUSTRALIA — As documented in the popular press and in a growing body of clinical research, sitting for long stretches of time is now considered to be as dangerous as smoking, with many health experts urging the population at large to stand up and get moving, or at the very least, to just stand up.

New findings from an Australian study lend support to the harms of too much sedentary time, with researchers showing that excessive sitting is associated with various cardiometabolic risk factors, including larger waist circumferences, higher triglycerides, and lower HDL-cholesterol levels^[1].

In the study, published July 31, 2015 in the *European Heart Journal*, Dr Genevieve Healy (University of Queensland, Brisbane, Australia) and colleagues say that cardiovascular health benefits—particularly for glucose and lipid metabolism—can be achieved if an individual replaces sitting with standing.

In their study, which included nearly 700 individuals wearing a posture-based activity monitor (activePAL3, PAL Technologies) participating in the Australian Diabetes, Obesity, and Lifestyle Study, each additional 2 hours spent sitting, which meant 2 hours less spent standing or moving, was associated with an approximately 3% higher body-mass index (BMI), waists that were roughly 2 cm larger, and higher fasting and 2-hour postload plasma glucose levels. In addition, each 2 hours spent sitting was associated with higher triglyceride levels and lower HDL-cholesterol levels.

The association of sitting and the adverse fasting plasma glucose and cholesterol markers remained statistically significant even after adjustment for the amount of moderate to vigorous physical activity the individuals performed daily. Adiposity markers and worsened 2-hour postload glucose were not significant after adjustment for physical activity.

Alternatively, each additional 2 hours spent standing was associated with lower fasting plasma glucose levels, lower total/HDL-cholesterol ratios, lower triglycerides, and higher HDL-cholesterol levels, even after adjustment for physical activity. Each 2 hours spent physically moving was associated with an approximate 11% reduction in BMI, nearly 8-cm smaller waist circumferences, and a 20% reduction in triglyceride levels. Markers of plasma glucose and HDL-cholesterol levels were also significantly better with each 2-hour period spent moving.

In a "reallocation" analysis, which assessed the benefits of shifting a 2-hour sitting block of time to standing, the researchers report this was associated with lower fasting plasma glucose levels, lower triglyceride levels, a better total/HDL-cholesterol ratio, and a 2.5-mg/dL increase in HDL cholesterol. Shifting from sitting to physically moving, instead of just standing, also improved glucose levels, triglycerides, HDL cholesterol, and atherogenic cholesterol ratios.

"These findings provide important preliminary evidence on the potential benefits of standing for cardiometabolic risk biomarkers, especially improved lipid metabolism," state Healy and colleagues.

Increasing Thermogenesis Unrelated to Exercise

In an editorial^[2], Dr Francisco Lopez-Jimenez (Mayo Clinic, Rochester, MN) points out that even the most physically active individuals, those who perform many hours of exercise each week, can be sedentary for considerable stretches of time throughout the day. Given the enlarging waist lines, and the attendant growing epidemic of diabetes and cardiovascular disease, Lopez-Jimenez says there is a need for "simple, pragmatic, and scalable recommendations to decrease sedentary behavior in the population.

"It is very clear that the fight against sedentary behavior cannot be won based only on the promotion of regular exercise," he writes. "Relying on fitness centers to increase physical activity in the general population means that a city of 100,000 inhabitants would require at least 200 fitness centers to accommodate the needs of exercise for everybody."

While pursuing exercise must continue as a recommendation for health promotion, Jimenez points out that avoiding sedentary behavior relies on increasing "nonexercise activity thermogenesis [NEAT]," rather than achieving daily or weekly exercise targets.

"A person walking while at work for 2 hours, standing for another 4 hours, and performing some daily chores at home for another hour will burn more calories than jogging or running for 60 minutes," he states. "Thus, there is a need for more emphasis to increase NEAT in our daily lives than on achieving goals of vigorous exercise in order to decrease sedentary behavior."

The study was funded by the National Health and Medical Research Council of Australia. Funding and logistical support for the Australian Diabetes, Obesity, and Lifestyle Study were provided by the Australian Government Department of Health and Ageing, Abbott Australasia, Alphapharm, Amgen Australia, AstraZeneca, Bristol-Myers Squibb, City Health Centre-Diabetes Service-Canberra, Department of Health and Community Services—Northern Territory, Department of Health and Human Services—Tasmania, Department of Health—New South Wales, Department of Health—Western Australia, Department of Health—South Australia, Department of Human Services—Victoria, Diabetes Australia, Diabetes Australia Northern Territory, Eli Lilly Australia, Estate of the Late Edward Wilson, GlaxoSmithKline, Jack Brockhoff Foundation, Janssen-Cilag, Kidney Health Australia, Marian & FH Flack Trust, Menzies Research Institute, Merck Sharp & Dohme, Novartis Pharmaceuticals, Novo Nordisk Pharmaceuticals, Pfizer, Pratt Foundation, Queensland Health, Roche Diagnostics Australia, Royal Prince Alfred Hospital, Sydney, Sanofi, Sanofi-Synthelabo, and the Victorian Government's OIS Program. The authors report no relevant financial relationships.

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Cite this article: Replace Sitting With Standing to Improve Cardiometabolic Risk Factors, Say Researchers. *Medscape*. Aug 13, 2015.

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