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# Sports Medicine *Bulletin*

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## Active Voice: Limit Your Sedentary Time – and Your BMI

By Stephanie E. Bonn, Ph.D., and Andrea K. Chomistek, Sc.D.

*Viewpoints presented in SMB commentaries reflect opinions of the authors and do not necessarily represent positions or policies of ACSM.*

*Stephanie E. Bonn, Ph.D., is a nutritional epidemiologist and assistant professor in the Clinical Epidemiology Division of the Department of Medicine at Karolinska Institutet in Sweden. Dr. Bonn is an ACSM member. Currently, she is a visiting scientist in the Department of Nutrition at the Harvard T.H. Chan School of Public Health in Boston, Massachusetts.*



Stephanie E. Bonn,  
Ph.D.



Andrea K. Chomistek,  
Sc.D.

*Andrea K. Chomistek, Sc.D., is an adjunct assistant professor in the Department of Epidemiology and Biostatistics at the Indiana University School of Public Health-Bloomington. Dr. Chomistek is a member of ACSM.*

*Today's feature commentary relates to the research paper that Dr. Bonn and Dr. Chomistek published with other colleagues. Their paper, "Exercise periodization over the year improves metabolic syndrome and medication use," appears in the December 2018 issue of Science in Sports & Exercise® (MSSE).*

For many years, physical activity research has been focused on the beneficial health effects of activities of moderate-to-vigorous intensity, e.g., dancing, jogging or playing tennis. More recently, sedentary time and its potential detrimental effects on health have gained increasing attention. While total sedentary time has been the focus in many studies, the ways we accumulate our total time spent being sedentary may be of considerable importance. For example, the approximately eight hours that people may typically spend in a sedentary state each day might be accumulated through many short bouts or in fewer longer bouts. Evidence of the detrimental effects of prolonged sedentary time on health is emerging, while previous studies also indicate that breaking up sedentary time, i.e., accumulating sedentary time in shorter bouts, is beneficial for health. We aimed to further study the difference of sedentary time accumulated in different ways in relation to energy expenditure and anthropometric markers. Duration of active and sedentary bouts may affect body mass index (BMI) and waist circumference, both of which strongly correlate to cardiometabolic risk.

Our 24-hour day is made up of sleeping time, sedentary time and time spent in activity of varying intensity levels including light, moderate and vigorous physical activity. How we choose to spend our time is a matter of individual choice but participating in one activity means not participating in another. Therefore, we cannot look at each behavior as independent. Findings from previous research suggest that replacing sedentary time with activities of higher intensity is beneficially associated with both BMI and waist circumference. Possibly, this is explained by an increase in energy expenditure. However, it is not known if a difference in energy expenditure might explain the differential effects of shorter versus longer bouts of sedentary time on health outcomes.

In this study, as described in [our research article published in the December 2018 issue of MSSE](#), we analyzed information from a large data set that included almost 1,400 women and men. Time spent in activities of varying

intensity levels was measured using a research-grade tri-axial accelerometer. Then, we calculated accelerometer-determined sedentary time in prolonged (30 minutes or more) or non-prolonged (less than 30 minutes) bouts and time spent in activities of higher intensity, i.e., light, moderate or vigorous. Thereafter, we investigated the associations between sedentary time or time spent physically active with body mass index (BMI), waist circumference and physical activity energy expenditure. Using the isotemporal substitution approach, we could account for the interdependency between time spent at different intensity levels.

Our results showed that replacing prolonged sedentary time with non-prolonged sedentary time was significantly associated with lower BMI and waist circumference in men, but this replacement was not associated with physical activity energy expenditure. However, replacing either type of sedentary time with light or moderate-to-vigorous physical activity was associated with higher physical energy expenditure, as well as lower BMI and waist circumference in both men and women.

Decreasing the number of prolonged sedentary bouts may have beneficial effects on BMI and waist circumference. Limiting overall time spent being sedentary and replacing sedentary time with activities of higher intensity may have additional effects on physical activity energy expenditure. Our results are important for future public health messages for some individuals, particularly older adults. For instance, it may be more feasible for older adults to replace sedentary time with light-intensity physical activity rather than moderate-to-vigorous activities. Although we did not see a difference in physical activity energy expenditure when substituting prolonged for non-prolonged sedentary time, limiting sedentary time of any kind, i.e., increasing time spent in any other physical activity behavior, is likely an important factor in weight maintenance.