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## **Sedentary teens more likely to have higher blood pressure**

Teenagers who spend a lot of time planted in front of the TV are more likely to have higher blood pressure, regardless of whether they are overweight. "This is the first research to show a direct and independent connection between TV watching and higher blood pressure among adolescents," said study leader Nicolas Stettler, M.D., M.S.C.E., a pediatric nutrition specialist at The Children's Hospital of Philadelphia.

The team reported on their study of 4,500 American adolescents in the February issue of the *Journal of Adolescent Health*. They found that sedentary activities and higher body mass index (BMI) were associated with higher systolic blood pressure. Systolic blood pressure is the pressure found when the heart pumps, in contrast to diastolic blood pressure, the pressure between heart beats.

"It was already known that physical activity lowers blood pressure in both adults and children, but sedentary activity is not just the opposite of physical activity," said Dr. Stettler. "For example, other studies have found that decreasing sedentary activity in young people helps prevent or treat obesity better than interventions to increase physical activity."

If further studies confirm these results, encouraging adolescents to reduce their sedentary activity may improve their blood pressure and lower their later risk of cardiovascular disease and stroke.

The researchers studied nationally representative data from 4,500 U.S. adolescents, aged 12 to 19, who participated in the 1999-2002 National Health and Nutrition Examination Survey. Interviewers assessed the adolescents' nutritional intake and activities. Measurements of blood pressure and BMI were adjusted for gender and age.

Within the 12- to 15-year-old age group, the study team found higher blood pressure to be especially associated with higher levels of watching television and video. "Although the

association between sedentary activity and systolic blood pressure was rather small, most adolescents spend several hours per day in sedentary activities," said Yasuki Kobayashi, M.D., Ph.D., of the University of Tokyo Department of Public Health, a co-author on this study.

"Interventions to decrease sedentary activities may have an important public health impact."

"Elevated blood pressure is one of the most important risk factors for cardiovascular diseases and stroke," said Mr. Takehiro Sugiyama, a medical student at the University of Tokyo and first author on this study. "High blood pressure in adolescents is predictive of hypertension in adulthood, and in addition, adolescent obesity is a predictor of obesity and cardiovascular risk factors in young adulthood and beyond."

The researchers also found that higher BMI is associated with lower diastolic blood pressure, contrary to associations found previously in studies of adults. The implications of this finding are unclear, but shows that adolescents are not just "small adults" and may have determinants of blood pressure that are different from adults said the authors.

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Dr. Stettler's co-authors were Takehiro Sugiyama, of the University of Tokyo, Japan; Dawei Xie, of the University of Pennsylvania; Rose C. Graham-Maar, M.D., M.S.C.E. now of St. Christopher's Hospital for Children; and Kazuo Inoue, M.D., Ph.D., and Yasuki Kobayashi, M.D., Ph.D., Department of Public Health, University of Tokyo.

About The Children's Hospital of Philadelphia: The Children's Hospital of Philadelphia was founded in 1855 as the nation's first pediatric hospital. Through its long-standing commitment to providing exceptional patient care, training new generations of pediatric healthcare professionals and pioneering major research initiatives, Children's Hospital has fostered many discoveries that have benefited children worldwide. Its pediatric research program is among the largest in the country, ranking third in National Institutes of Health funding. In addition, its unique family-centered care and public service programs have brought the 430-bed hospital recognition as a leading advocate for children and adolescents. For more information, visit <http://www.chop.edu>.

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