

Blood pressure recording over 24 hours is the best predictor of heart and vascular disease

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High blood pressure is the most important treatable risk factor for

diseases of the heart and the arterial system. Blood pressure recorded over 24 hours predicts these complications more accurately than blood pressure measured on a single occasion. That is the conclusion of an international study coordinated by Professors Jan A. Staessen and Zhen-Yu Zhang of KU Leuven in Belgium. Dr. Gladys Maestre from the University of Texas, Rio Grande Valley School of Medicine, supervised the study in Venezuela, one of the participating countries. The study was published in the *Journal of the American Medical Association*.

An international consortium of scientists followed 11,135 individuals for 14 years. Study participants included residents of 12 countries in Europe, East Asia, and Latin America. The researchers compared the predictive accuracy of [blood](#) pressure measurements made by a healthcare provider in an office setting, to repeated blood pressure measurements recorded for 24 hours, during both day and night. The results showed that the probability of heart and vascular disease during follow-up was closely associated with the blood pressure measured over a 24-hour period.

"Although heart and vascular disease are strongly associated with blood pressure, irrespective of how it is measured, until now we did not know which type of blood pressure measurement captured risk in the most accurate way," Dr. Maestre said.

At the start of the study, investigators made individual blood pressure measurements using all available approaches, and determined other risk factors. Blood pressure was also recorded over a 24-hour period using automated portable blood pressure monitors. The number of blood pressure measurements averaged 30 during daytime and 10 during sleep. One of the advantages of measuring blood pressure during sleep, with individuals lying down in bed, is that the results are not influenced by daytime activities or meals. This at least partly explains the accuracy of nighttime blood pressure in predicting cardiac and vascular illness.

High blood pressure is the leading treatable risk factor for diseases of the heart and vascular system. Worldwide, high blood pressure causes 10 million deaths each year, with more than half of that mortality attributable to cardiovascular disease. The present study is unique in its large sample size and long follow-up period. The characteristics of participants were similar to those of the populations from which they were enrolled, so the results can be generalized.

"Our research highlights the necessity of using 24-hour measurements to diagnose high blood pressure and to institute and fine tune its treatment," said Dr. Maestre. "Nevertheless, most health insurers in the US reimburse 24-hour ambulatory blood pressure monitoring only when blood pressure is found to be high in the clinical setting, but is suspected to be normal otherwise, or if undetected or masked hypertension is suspected. However, 24 hour ambulatory blood pressure monitoring is cost effective: It enables the prevention of cardiovascular disease by starting treatment in a timely manner."

Prevention and improved control of high blood pressure is also cost effective, because hospital-based treatment of the complications of high blood pressure, such as chest pain caused by narrowing of the arteries of the heart, myocardial infarction, and stroke, is expensive. Furthermore, prevention reduces the risk of premature disability and death, thereby avoiding suffering of patients and their families. About 30 percent of all adults and 60 percent of people age 60 and over have [high blood pressure](#). Therefore, ambulatory [blood pressure](#) monitoring should be available at all levels of the healthcare delivery chain.

More information: Wen-Yi Yang et al, Association of Office and Ambulatory Blood Pressure With Mortality and Cardiovascular Outcomes, *JAMA* (2019). [DOI: 10.1001/jama.2019.9811](https://doi.org/10.1001/jama.2019.9811)

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