

# Surpassing critical blood pressure threshold could signal hypertension regardless of age

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Hypertension, abnormally high blood pressure, is associated with an increased risk of heart attack and stroke. Many healthcare professionals still believe that incremental changes in blood pressure are normal, and expected, with aging. A new study by investigators at Brigham and Women's Hospital, published in the journal of *JAMA Cardiology*, found that a systolic (top) blood pressure that regularly exceeds 120-125 mmHg could signal impending hypertension, regardless of age. These results are in line with the recently updated American College of Cardiology and American Heart Association high blood pressure guidelines, which categorize high blood pressure as greater than 130/80 mmHg.

"There used to be a widespread belief that a gradual increase in blood pressure over time is part of normal aging," says Susan Cheng, MD, a cardiologist at BWH and senior author on the paper. "But, if you look at native communities, where people live without the lifestyle exposures usually seen in industrialized societies, this trend is hard to find. And so, we wondered if blood pressure is supposed to very gradually increase over time or instead remain stable. We also wanted to find out, for people in whom blood pressure does rise, is there a tipping point at which hypertension starts to develop. In other words, if hypertension does develop, when does the change start to happen, what does it look like, and how might we prevent it?"

In the study, researchers examined data from 1,252 participants from the Framingham Heart Study, which contains one of the few existing cohorts

with standardized blood pressure (BP) measurements performed at frequent intervals (every two years) over an extended period of time (1948 to 2005). The team defined hypertension onset as a blood pressure over or equal to 140/90 mmHg. Participants were categorized based on the age at which their hypertension was diagnosed (age 40-49, 50-59, 60-69, 70-79 years, or no onset).

The research team found that, among the patients who developed hypertension, blood pressure trajectories leading up to the onset of hypertension appeared similar in pattern. In fact, their [blood pressure levels](#) were generally stable until they approached the range of ~120-125 mmHg, above which their blood pressure rose rapidly and into the range of hypertension. This finding was consistent whether the hypertension developed in middle or older age, suggesting that blood pressures above this level could represent a critical threshold of vascular remodeling occurring in the body. Interestingly, this blood pressure range is in line with recently published guidelines that lowered the definition of high systolic blood pressure to 130 mmHg.

"Although our findings suggest the potential importance of working to keep your top blood pressure number below 120 mmHg, they also offer a hope for healthy aging - our results demonstrated that some individuals are able to maintain a very normal range of blood pressure throughout life," says Niiranen Teemu, MD, first author and a research associate at Brigham and Women's Hospital.

The researchers found that many people in the study were able maintain a [systolic blood pressure](#) below 120-125 mmHg and, in effect, delay the uptick of blood pressure elevation until much later in life and, in some cases, avoid it altogether. This new way of understanding life course trends in blood pressure could affect clinical practice by motivating physicians to be more vigilant when encountering blood [pressure](#) at or approaching uptick levels. Further investigations are needed to unravel

the sequence of changes in the body that occur before [hypertension](#) sets in and to determine the potential benefits of interventions in preventing progressive rises in [blood pressure](#), at any age.

Provided by Brigham and Women's Hospital

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