

## Long-Term Blood Pressure Variability Is Associated with Structural and Functional Changes to the Heart

*Greater BP variability in early adulthood correlated with worse echocardiographic features at middle age.*

Visit-to-visit blood pressure variability (BPV) has been associated with adverse cardiovascular outcomes, independent of BP level. To understand if BPV in early adulthood is associated with later subclinical alterations in cardiac structure and function, researchers used data from a U.S.-based community cohort study (CARDIA) in which participants aged 18 to 30 at enrollment underwent eight BP evaluations over 25 years of follow-up and an echocardiogram at year 25.

A total of 2400 participants completed follow-up (men, 43%; African-American, 41%; mean age at year 25, 50). Greater visit-to-visit systolic and diastolic BPVs, independent of the mean BP, were associated with worse results on measures of left-ventricular mass index, diastolic function, left-ventricular filling pressure, and global longitudinal strain. The findings were consistent even among participants with normal BP levels (<130/80 mm Hg) and those who had never used BP-lowering medications.

### COMMENT

Blood pressure is dynamic and can change from minute to minute in response to physiologic signals. But BPV refers to fluctuations in BP from day to day or from one clinic visit to another. Prior evidence suggests that increased long-term BPV is associated with higher risk for stroke, cardiovascular events, and mortality. This study adds to our knowledge by showing an association between high BPV in young adulthood and risk for myocardial alterations known to precede cardiovascular disease outcomes. — **Karol E. Watson, MD, PhD, FACC**

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Nwabuo CC et al. Association between visit-to-visit blood pressure variability in early adulthood and myocardial structure and function in later life. *JAMA Cardiol* 2020 Apr 15; [e-pub]. (<https://doi.org/10.1001/jamacardio.2020.0799>)