

UVA Health Team Maps Brain's Blood Pressure Control Center Researchers ID Nerve Cells that Stabilize Moment-to-Moment Blood Pressure Changes

Charlottesville, Va., Feb. 18, 2026 – Doctors usually focus on a person's average blood pressure, but research increasingly shows that how much blood pressure fluctuates from moment to moment is just as important. Excessive short-term variability is a strong and independent predictor of heart disease, stroke and brain injury.

A group in University of Virginia School of Medicine's Department of Pharmacology has identified a group of nerve cells in the brainstem – a region that controls vital automatic functions – that act as a stabilizing system for blood pressure. The new research suggests these cells help prevent fluctuations when the body shifts between everyday activities such as sleeping, waking up, standing or exercising.

"What we found is that a loss of just a few hundred nerve cells leads to unstable blood pressure even though the mean blood pressure was normal," said UVA's Stephen Abbott, PhD, the lead investigator of the study. "This shows that the system that keeps blood pressure steady from moment to moment is no longer working."

Loss or dysfunction of these same brain cells has already been documented in people with multiple system atrophy, a rare and fatal neurological disease related to Parkinson's disease that is marked by severe blood pressure problems. The findings suggest that similar brain-based mechanisms could contribute to blood pressure instability in other conditions where average blood pressure appears normal by standard measurements. The findings could open the door to treatments to stabilize blood pressure and prevent those harmful effects.

"Our work emphasizes a new appreciation for how we think about blood pressure problems," Abbott said. "It's not just about lowering the numbers – it's about keeping blood pressure stable from moment to moment."

Abbott and his colleagues have published their blood pressure findings in the scientific journal *Circulation Research*. The research team consisted of George M.P.R. Souza, Harsha Thakkalapally, Faye E. Berry, Leah F. Wisniewski, Ulrich M. Atongazi, Daniel S. Stornetta and Abbott. The scientists have no financial interest in the work.

The research was supported by the National Institutes of Health, grant HL148004.

Finding new ways to understand and treat the most complex and challenging medical conditions is a primary mission for UVA's new Paul and Diane Manning Institute of Biotechnology. The institute aims to accelerate how quickly lab discoveries can be translated into lifesaving new treatments for patients.

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