

Your blood pressure and heart rate change to meet physical and social demands

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Blood pressure and heart rate are not fixed, but rather they adapt to meet physical and social demands placed on the body, according to new research from Binghamton University, State University at New York.

Researchers at Binghamton University recorded the blood [pressure](#) and [heart](#) rate of women in sedentary positions (e.g. secretaries, technicians) over a three-month time frame—from the moment these women woke up until they went to sleep.

"The reason why their job matters (sedentary type work) is that it is highly likely that the subjects are going to be doing the same things pretty much every day, so you can set up a hypothesis that similar activities give you the same results," said Gary D. James, SUNY Distinguished Service Professor of anthropology at Binghamton University.

The results showed that in these sedentary workers, both blood pressure and heart rate patterns during the day were highly reproducible over three months. The study provided strong evidence that blood pressure and heart rate undergo allostasis, meaning they change to meet demands, and that the body does not defend blood pressure or heart rate setpoints.

"The physiological concept of allostasis suggests that some biological functions constantly change to meet the demands of the external environment (both physical and social)," said James. "This principle is in juxtaposition to the concept of homeostasis, which states that biological functions try to maintain a setpoint (a good example is maintaining body core temperature at 98.6 degrees). Blood pressure and heart rate are thought to undergo allostasis. So, if that is true, then someone who goes through the same routine day after day (confronting similar demands each day) should have a reproducible pattern of circadian variation in their [blood](#) pressure and heart rate that corresponds to changing daily demands (e.g. going to work, being at home and then sleeping).

This sort of study is easy to do in a lab where you have control over the activities, etc., said James. What is unique here is that it shows that reproducible responses actually happen to more broadly defined activity

in real life, too.

"If the participants had an occupation that required varied activities from day to day, it wouldn't be possible to essentially mimic in real life what happens in the lab," said James. "The results demonstrate that there are repetitive biological responses to repetitive activity patterns. What impact repetitive responses have on long-term health is unknown."

The study, "The consistency of circadian [blood pressure](#) and [heart rate](#) patterns over three months in women employed in sedentary office jobs," was published in the *American Journal of Human Biology*.

More information: Alexandra M. Niclou et al, The consistency of circadian blood pressure and heart rate patterns over three months in women employed in sedentary office jobs, *American Journal of Human Biology* (2018). [DOI: 10.1002/ajhb.23177](https://doi.org/10.1002/ajhb.23177)

Provided by Binghamton University

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