

Why men and women handle stress differently

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Jason Carter and Huan Yang set up a subject in their lab for stress testing.

Men and women handle stress differently. Most people probably would agree with that statement, but researchers at Michigan Technological University are pinpointing the physiological reasons behind what is, indeed, fact.

Jason Carter, chair of kinesiology and integrative physiology; math

professor Tom Drummer; and graduate student Huan Yang, recently reported some surprising findings in the *American Journal of Physiological, Heart and [Circulatory Physiology](#)*. They claim that younger women's bodies may handle stress better than [younger men's](#), but that might not be true later in life.

"It is well known that men are more susceptible to high blood pressure early in life," Carter says. "However, most people are unaware that women may be more susceptible after menopause."

Carter, Drummer and Yang's work focuses on the muscle [sympathetic nerve activity](#) (MSNA), part of the "fight or flight" response that helps to increase heart rate and blood pressure when the body senses a need.

They tested 34 men and women during five minutes of [mental stress](#) and five minutes of rest, inserting a microelectrode needle into a nerve in the subjects' lower legs. Measurements included [heart rate](#), blood pressure and limb blood flow.

The scientists found that during mental stress, women experienced more widening of their calf blood vessels ([vasodilation](#)), and that was similar to the results of test on their forearms. Men, on the other hand, experienced no such change in the calf. This vasodilation could help the women deal with stress, Carter suggests.

However, he says, the key finding was what happened with the [sympathetic nervous system](#).

"The study found an inverse relationship between changes of calf blood flow and MSNA in men but not in women," Carter says. "In other words, men saw a potent surge of sympathetic activity associated with stress, which led to more constriction of blood vessels in the leg. We call this 'sympathetic vascular transduction,' and this study was the first to

demonstrate that this transduction was more potent in young men than young women during stress."

And the big picture?

"This work is important because we know that stress takes an enormous toll on human bodies, especially the cardiovascular system," Carter says. "[High blood pressure](#), increased heart rates and cardiovascular disease are all related to stress."

The research findings are also important because of one overlooked aspect.

"Traditionally, women did not play a role in neural-cardiovascular research until fairly recently," Carter says. "Today, NIH won't fund your work unless women are included, and rightly so. Women and men may not need the same types of preventative or therapeutic strategies for disease, and we won't know that if we avoid studying 50 percent of our population."

In the future, Carter would like to determine if this 'sympathetic vascular transduction' changes at menopause, a time when [women](#) become a much higher risk for cardiovascular disease. He says there is evidence suggesting such changes do occur, primarily as a result of hormonal changes.

Provided by Michigan Technological University

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