Hidden menstrual cycle patterns offer new way to track aging and long-term health

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Scientists at SRI International in the US have developed an open-source tool designed to analyze the vast wealth of physiological data hidden within the menstrual cycle. Their long-term goal is to provide

personalized health monitoring by identifying unique bodily patterns in different individuals. Already, the team behind the innovation has used it to chart how a woman's resting body temperature and cycle length shift as she grows older.

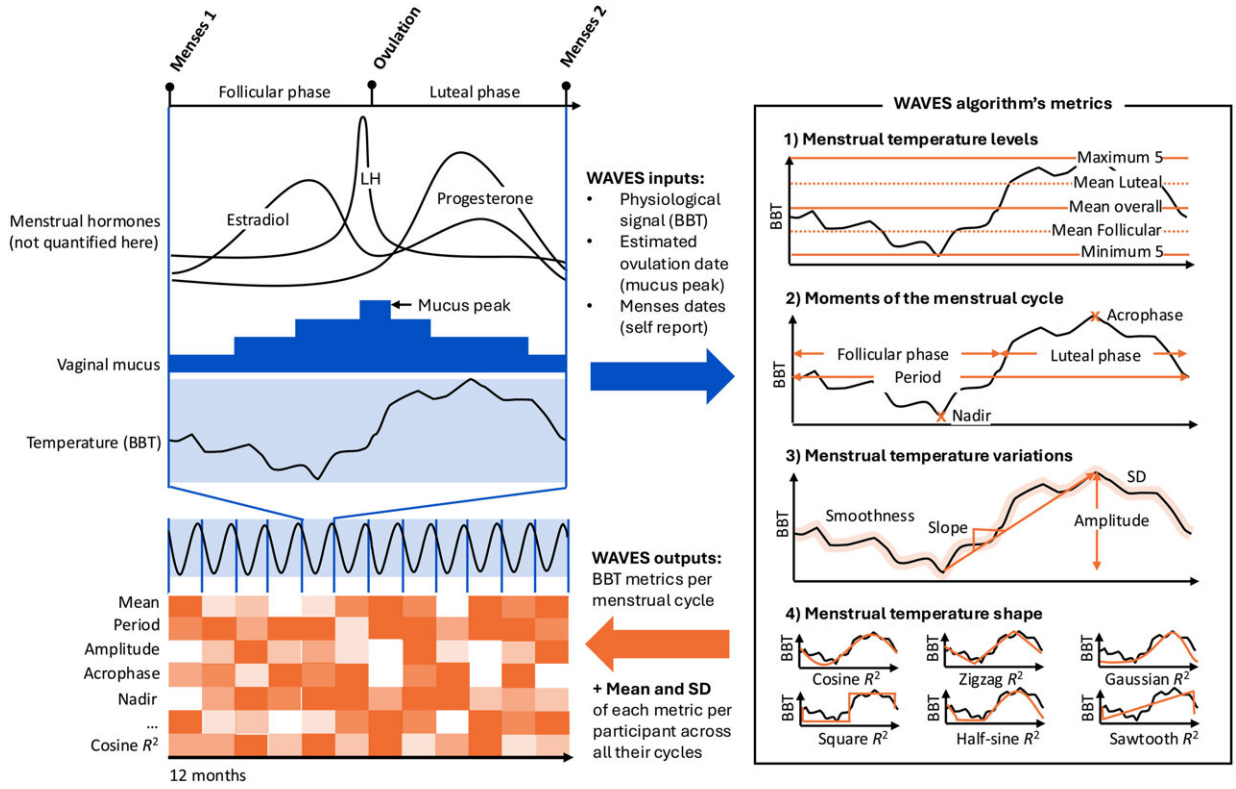
The menstrual cycle is an underused yet powerful tool for understanding overall health. Most menstrual health research and consumer apps focus mainly on fertility, yet only about 1% of a lifetime's cycles result in a pregnancy.

Tapping into the biological data

To tap into this rich source of biological information, researchers developed WAVES (women's health assessment through variability in endocrine-related signals). It is essentially an algorithm that can take daily physiological signals linked to the menstrual cycle and break them down into dozens of measurable health metrics.

As the scientists write in a paper published in *Science Advances*, they tested WAVES using a dataset comprising 5,674 menstrual cycles from 753 individuals aged 18 to 42.

The algorithm concentrated on two daily measurements that women already track, which are resting body temperature and shifts in the cervical mucus. This last indicator helps estimate when ovulation occurs. Using this information, WAVES broke down each cycle into 32 metrics such as cycle length, the timing of ovulation, how fast temperature rises, and day-to-day temperature fluctuations.



Schematic representation of the menstrual cycle variations and how the WAVES algorithm captures menstrual temperature metrics. Credit: *Science Advances* (2026). DOI: 10.1126/sciadv.aeb1175

"Certain metrics of the menstrual cycle patterns in temperature may be particularly relevant to consider at the individual level across multiple cycles, first establishing the individual's baseline and regularity levels, to allow the assessment of changes over time in relation to aging or health conditions," explained the team in their paper.

Next, the study authors used those metrics to compare a younger group (ages 18 to 35) with a slightly older group (ages 35 to 42). They found that the older women have shorter menstrual cycles, slightly higher temperatures, and less regular cycle patterns.

They also tracked individual users over time to see how their metrics changed with age. This revealed that many individuals have a unique health profile that stays remarkably consistent from month to month, only shifting gradually as they age.

Next-gen tools

Because this individual menstrual cycle information can serve as a basis for tracking long-term wellness, the scientists note that it could lead to new medical technologies.

"This work suggests that the WAVES algorithm can be used for advancing digital biomarker discovery and highlights the relevance of a personalized approach in the development of next-generation tools for women's health," said the researchers.

More information: Marie Gombert-Labedens et al, Identifying menstrual metrics as personal health markers: Age trends and individual footprints in temperature across 5674 cycles, *Science Advances* (2026). DOI: 10.1126/sciadv.aeb1175