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Wichita State research team receives NIH funding to develop wearable fetal heart rate monitor

By WSU Strategic Communications



From left, Wichita State University researchers Jolynn Dowling, Yongkuk Lee, Nikki Keene Woods and Jamie Harrington.

A Wichita State University research team has received \$432,565 from the National Institutes of Health (NIH) for its proposal, “Examining the feasibility of a wearable device for fetal heart rate monitoring through interdisciplinary research.”

The objective is to develop a wireless, non-invasive, wearable fetal electrocardiogram monitoring device that will use algorithms and cloud-based health monitoring to improve clinical care among pregnant women in rural communities.

Maternal and infant health outcomes in rural areas of the U.S. represent a constant and growing health need. Innovative wearable medical devices create an opportunity to address health disparities in rural communities.

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— Jamie Harrington

Widespread use of a wearable fetal heart monitoring device is likely to improve obstetrical care for pregnant women through the ability to increase maternal mobility during labor and improve birth outcomes for both women and infants.

“In my practice, many of my patients live in rural and underserved areas and have to drive long distances to access health care,” says Jamie Harrington, a certified nurse midwife and family nurse practitioner at Sunflower Health. “A wireless, portable fetal monitoring device could improve screening and monitoring during pregnancy without the need for an actual in-person office visit. This device has the potential to be able to detect abnormalities in the fetal heart rate, which could improve perinatal outcomes and be a solution to improve access to health care.”

The combination of sensor technologies, wearable electronics, and real-time remote health monitoring provide a unique opportunity to improve the quality of health care, decrease costs and increase access to health care that could positively impact maternal and infant care, especially in rural and remote areas.

The funding is part of the NIH Research Enhancement Award Program (REAP) for Health Professional Schools, which supports small-scale research projects at educational institutions.

This REAP award will allow more qualified graduate and undergraduate students to participate in research opportunities at Wichita State. Through this interdisciplinary research project, students will learn new research skills in the fields of biomedical engineering, nursing and public health.

Funding is provided by the National Institute of Child Health and Human Development. The last time WSU received funding from this division of NIH was in 1999.

The research team members are:

- **Dr. Nikki Keene Woods**, professor in the Department of Public Health Sciences and principal investigator for the project
- **Dr. Yongkuk Lee**, assistant professor in Biomedical Engineering
- **Jolynn Dowling**, Janice M. Riordan Distinguished Professor in Maternal Child Health in the School of Nursing
- **Jamie Harrington**, assistant professor in the School of Nursing and clinical partner lead from the Sunflower Birth and Family Wellness Center in Winfield

The research team is excited to continue its interdisciplinary research with an emphasis on training students in research, Keene Woods said.

“Support from federal agencies such as the National Institutes of Health, the leading medical research agency, is important to continue to grow the culture of research at Wichita State,” she said.