

# Wearables Using Photoplethysmography Sensors for Non-Invasive Blood Glucose Detection Validated

*A local study shows that sensors commonly found in wearables can aid in the non-invasive detection of elevated blood glucose levels*

SINGAPORE, SINGAPORE, SINGAPORE, October 10, 2024 /EINPresswire.com/ -- Imagine detecting the risk of diabetes with a wearable device, allowing for early intervention through positive lifestyle changes to delay or even prevent the development of this chronic disease.



Sensors commonly found in wearables can aid in the non-invasive detection of elevated blood glucose levels (Image source: Stock image)

Type 2 diabetes mellitus (T2DM) is a global non-communicable disease, with cases surging from 108 million in 1980 to 422 million in 2014[1]. Recognising the importance of early detection and intervention, [Actxa](#) Pte Ltd (Actxa) partnered with KK Women's and Children's Hospital (KKH) on a research study.

This study, "Utility of photoplethysmography in detecting elevated blood glucose among non-diabetics", recently published in the Singapore Medical Journal, shows that using photoplethysmography (PPG) signals (the green or red light on most wearables that measure heart rate), a non-invasive method of assessing T2DM risk, is a viable option to provide a more cost-effective and more accessible modality for screening in the community. The full study can be accessed [here](#).

From October 2021 to February 2023, healthy volunteers were recruited at KKH. 483 volunteers' capillary glucose levels were measured alongside PPG signals using Actxa's Spark + Series 2 activity tracker and an in-ear wearable. The volunteers were evaluated over eight minutes to obtain accurate PPG readings.

Participants with capillary glucose levels of 11.1 mmol/dL or less consumed a standard glucose tolerance drink (TRUTOL. 75 g) and returned one hour later for a follow-up test. In contrast,

those with readings exceeding 11.1 mmol/dL were exempted from the glucose tolerance drink. This methodology ensured the thorough evaluation of blood glucose levels, thereby enhancing the reliability of the study's findings.

This research leverages the innovative use of PPG sensors to monitor and evaluate increased blood glucose levels non-invasively. The study has revealed that non-invasive diabetes risk assessment using PPG is a practical and cost-effective method for population-wide screening. This non-invasive nature of the PPG approach makes it accessible, encouraging early detection and allowing individuals to adopt timely positive lifestyle changes and seek medical interventions before more severe complications develop.



Actxa CEO, Marcus Soo

This study has also demonstrated the capabilities of Actxa's Blood Glucose Evaluation & Monitoring ([BGEM](#)) technology, the world's first non-invasive diabetes risk assessment powered by an AI-driven algorithm. BGEM is a cloud-based technology that can be seamlessly integrated into wearable devices with PPG sensors to assess the risk of impaired glucose regulation.

As countries grapple with rising healthcare costs related to diabetes care, this technology can potentially reduce long-term healthcare burden by focusing on prevention. Early detection enables individuals to make lifestyle changes that can prevent or delay the onset of T2DM, ultimately leading to healthier populations and more sustainable healthcare systems.

Marcus Soo, Chief Executive Officer of Actxa, said, "In our pursuit of innovative solutions to address global health challenges, Actxa is proud that our technology has been validated through a local study. We are on track to reveal a transformative breakthrough in how we evaluate prediabetes and T2DM risk using PPG sensors.

Actxa's BGEM technology, which integrates into wearables with PPG sensors, offers a cost-effective and scalable method for non-invasive blood glucose risk assessment, positioning us at the forefront of preventive health technology.

The opportunities here are paradigm-shifting—a wearable device on your wrist, finger, or ear

could detect early diabetes risks, enabling individuals to make proactive lifestyle changes. This collaboration reflects our commitment to pushing preventive healthcare innovation, making early detection and prevention accessible for all. Together with our partners, we are charting the course towards a healthier future for individuals and our communities.”

Future developments will involve incorporating various non-invasive detection sensors to enhance sensitivity and specificity, enabling better management of T2DM through non-invasive methods alongside capillary glucose measurements.

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