

MEDIA RELEASE

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NATIONAL UNIVERSITY HOSPITAL TO EXPAND WEARABLE TECHNOLOGY FOR PATIENT MONITORING FOLLOWING SUCCESSFUL PILOT

Continuous smartwatch monitoring shown to safely support post-surgical care, reducing disruptions for patients and easing nursing time for direct patient care

SINGAPORE — The National University Hospital (NUH) is set to expand the use of wearable technology after a successful pilot found that continuous smartwatch-based monitoring could identify changes in patients' vital signs up to two hours earlier than routine manual observations, demonstrating its potential to allow clinicians to respond sooner, reduce disruptions to recovering patients, and enable nurses to spend more time on other aspects of patient care that require their clinical judgement.

Following the month-long pilot, which concluded in June, NUH is now working towards having up to 10 per cent of suitable inpatient vital signs monitoring be supported by wearable technology over the coming year. The initiative is part of the hospital's broader efforts to leverage digital innovation to enhance patient safety, improve the patient experience, and optimise care delivery.

The pilot was led by the NUH Department of Surgery in collaboration with a multidisciplinary team comprising surgical ward nurses, operations staff, and researchers from the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine). The project team included A/Prof Tan Ker Kan, Senior Consultant, Dr Lee Kai Yin, Consultant, and Dr Lim Tian Zhi, Associate Consultant.

Participants wore a smartwatch equipped with Health Sciences Authority (HSA)-approved vital signs monitoring capabilities that continuously monitored patients' blood pressure, pulse rate, and blood oxygen saturation.

Throughout the pilot, nurses continued routine bedside vital signs checks by recording the smartwatch readings at the usual hourly or four-hourly intervals. Where the smartwatch detected abnormal readings, nurses confirmed the measurements using standard bedside equipment before escalating care in accordance with existing protocols.

Earlier detection while maintaining patient safety

The pilot demonstrated that wearable monitoring could safely complement routine post-surgical care while providing clinicians with earlier visibility of potential physiological changes.

Key findings included:

- **No critical clinical events were missed** during smartwatch monitoring.
- **Abnormal vital signs were identified up to two hours earlier** than routine nursing observations.
- **All abnormal readings triggered existing clinical escalation protocols** and were reviewed promptly by nurses.
- **Patients experienced fewer disruptions**, especially from routine overnight observations.
- **Nurses reported reduced time spent on routine and repetitive monitoring tasks.**

During the pilot, the smartwatch identified the following earlier than routine nursing observations:

- 14 episodes of low systolic blood pressure (below 100 mmHg).
- Two episodes of high systolic blood pressure (above 160 mmHg)
- One episode of low pulse rate (below 50 beats per minute); and
- One episode reduced blood oxygen saturation (below 95%).

All patients were promptly reviewed by nurses in accordance with existing clinical protocols, and none of these episodes progressed to clinical deterioration.

Helping patients recover more comfortably

Beyond patient safety, the pilot sought to improve patients' recovery experience by reducing unnecessary interruptions, particularly when being warded overnight.

Patients in both the smartwatch and conventional monitoring groups reported waking an average of around three times during the night. However, only seven per cent of the 30 patients (two patients) in the smartwatch group attributed these disruptions to routine vital signs measurements, compared with 17 per cent of the 30 patients (five patients) who underwent conventional monitoring.

One patient who participated in the pilot, Mdm Ho Mei Guat, said: "I found the smartwatch comfortable to wear and easy to get used to. It allowed me to rest well during my stay in hospital, and it was reassuring to know that my vital signs were being monitored continuously as I recovered."

Giving nurses more time to focus on patient care

Currently, routine vital signs monitoring is one of the most frequently performed nursing tasks in the hospital. Each observation takes nurses approximately two minutes, including manual documentation.

Following the pilot, NUH plans to integrate smartwatch data directly into its EPIC electronic medical record system, enabling automatic documentation of patient observations. This is expected to reduce the time required for each check from two minutes to around 40 seconds per patient.

Nurse Manager Lim Pooi See said: "Routine vital signs monitoring is a critical component of post-surgical care, but it can also be time-consuming and repetitive. Wearable technology enables continuous patient monitoring while reducing unnecessary interruptions. By replacing conventional wired monitoring with a wearable device, patients can move more comfortably with fewer attachments, supporting early mobilisation during recovery. At the same time, nurses can devote more time to patients who require closer observation and more direct, personalised care."

A step towards the future of inpatient care

Associate Professor Asim Shabbir, Head and Senior Consultant in the Department of Surgery at NUH, said, "This pilot shows how technology can strengthen, rather than replace, clinical care. By automating vital signs monitoring, we can identify changes in patients' conditions earlier, giving clinicians greater visibility of their recovery without having to wait for the next scheduled observations.

"At the same time, patients can rest without being woken for vital signs checks, while nurses have more time to focus on direct patient care instead of routine tasks.

"The encouraging results have given us confidence to explore wider implementation across suitable patient groups. As we expand the programme, patient safety will remain our top priority, and we will continue to evaluate the clinical context and suitability of the technology in different care settings, where it can deliver the greatest benefits."

The pilot marks the first step in NUH's broader efforts to integrate wearable technology into inpatient care. As the programme expands, the hospital will continue evaluating how the technology can be safely introduced for other suitable patient groups to improve both patient experience and support more efficient care delivery.

Chinese Glossary

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About the National University Hospital (NUH)

The National University Hospital (NUH) is Singapore's university hospital. While the hospital at Kent Ridge first received its patients on 24 June 1985, our legacy started from 1905, the date of the founding of what is today the NUS Yong Loo Lin School of Medicine. NUH is the principal teaching hospital of the medical school.

Our unique identity as a university hospital is a key attraction for healthcare professionals who aspire to do more than practise tertiary medical care. We offer an environment where research and teaching are an integral part of medicine and continue to shape medicine and transform care for the community we care for.

We are an academic medical centre with over 1,200 beds, serving more than one million patients a year with over 50 medical, surgical and dental specialties. NUH is the only public and not-for-profit hospital in Singapore to provide trusted care for adults, women and children under one roof, including the only paediatric kidney and liver transplant programme in the country.

The NUH is a key member of the National University Health System (NUHS), one of three public healthcare clusters in Singapore. For more information, visit www.nuh.com.sg

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