

The transformative potential of remote patient monitoring in health care

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The health care community has often been compelled to innovate, often with remarkable speed and effectiveness. Among these innovations, the deployment of remote patient monitoring systems is a paradigm shift.

In the study reported in this issue of the *MJA*, Kim and colleagues investigated the safety and effectiveness of remote patient monitoring during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) Omicron wave in the South Eastern Sydney Local Health District during 26 November 2021 – 30 June 2022.¹ Their retrospective study included 276 236 people aged 15 years or older with positive test results for SARS-CoV-2. The authors offer compelling evidence for the utility of remote patient monitoring in enhancing health outcomes. People who were remotely monitored could benefit from timely clinical interventions facilitated by the continuous monitoring of their vital signs and symptoms via a smartphone app that enabled the early identification of clinical deterioration and clinician support. Compared with a propensity score-matched people with SARS-CoV-2 infections who received routine care, 28-day mortality was markedly lower for those who participated in remote patient monitoring (adjusted odds ratio, 0.19; 95% confidence interval [CI], 0.08–0.43). Remote patient monitoring was also associated with more hospital admissions, but with a shorter mean hospital length of stay, probably reflecting a model of care in which appropriate escalation of care is a priority, ensuring that hospital resources are used effectively. The hospital stays of people who had been remotely monitored were a mean 3.54 (95% CI, 0.69–6.39) days shorter than for those receiving usual care, which could result in substantial hospital bed-day savings.¹

Kim and colleagues found that the 28-day mortality risk was higher for Indigenous Australians with coronavirus disease 2019 (COVID-19), even after adjusting for socio-economic status and comorbidity. This finding indicates that remote patient monitoring and other interventions must be tailored according to the barriers faced by disadvantaged groups, including cultural, linguistic, technological, and geographic obstacles. The authors' success in leveraging technology for community care suggests that remote patient monitoring could be a powerful tool for overcoming health care inequities if implemented inclusively.

Other important goals of health system design — improving the experience for both patients and clinicians, reducing health care costs^{2,3} — were not evaluated by Kim and colleagues. One notable aspect of their study design was that the remote patient monitoring group included a larger proportion than the usual care group of people at high risk of severe COVID-19, including older adults and people at greater risk of hospitalisation or with other medical conditions. The selection process for remote patient monitoring was not clearly described, and people under 15 years of age were excluded. These factors introduced selection

bias that should be carefully considered when generalising the study results. While the authors used propensity score adjustment to reduce potential confounding, they acknowledged that residual confounding by unmeasured variables could not be fully eliminated.

The broader implications of the study by Kim and colleagues extend beyond the COVID-19 pandemic. The principles of remote patient monitoring — proactive monitoring using digital health technologies such as mobile phone apps, phone calls, and wearable devices, data-driven decision making, and person-centred care — are applicable to a variety of acute and chronic conditions.^{4,5} People with chronic diseases such as heart failure, hypertension, diabetes, and chronic obstructive pulmonary disease could benefit immensely from similar remote patient monitoring frameworks.⁶ Further, AI-driven predictive analytics could improve the efficiency, accuracy, and person-centric focus of these systems.⁷ Kim and colleagues also highlight the importance of resource allocation, commenting that targeted remote patient monitoring programs that are focused on people at greatest risk yield the greatest benefits.¹

Despite its promise, remote patient monitoring faces several challenges.⁸ Recent initiatives, including Medical Research Future Fund grants and departmental programs, have indicated that the Australian Department of Health is committed to advancing remote patient monitoring.⁹ But to fully realise its potential, funding mechanisms are needed to support both hospital-based and primary care applications, ensuring equitable access and long term sustainability. Current activity-based funding arrangements cover virtual care costs for public hospital services when remote patient monitoring is delivered as part of in-scope services, such as hospital-in-the-home with therapeutic or clinical content.⁹ Technological literacy, access to reliable internet, and data security are other aspects that need to be considered.¹⁰ Limitations inherent to retrospective analyses, such as unrecognised confounders and data linkage errors, must be carefully managed in future studies.

The findings of Kim and colleagues are a strong basis for advocating the expansion of remote patient monitoring initiatives, during and beyond pandemics. The integration of remote patient monitoring into routine health care could transform how we manage patient care, improving outcomes while optimising resource use, with the aim of an equitable health care system. By harnessing technology to monitor patients in their homes, health care systems could reduce short term mortality, alleviate pressure on hospital resources, and reduce inequities in care. The study by Kim and colleagues is not just a testament to the potential of remote patient monitoring, but also a clarion call for its broader adoption in health care systems worldwide. As we navigate an uncertain future, remote patient

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monitoring is a beacon of resilience and innovation in modern medicine.

Competing interests: No relevant disclosures.

Provenance: Commissioned; not externally peer reviewed. ■

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