

From vision to reality: AI's role in redefining integrated patient-centred care in Australia, Japan, and South Korea

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Introduction

As healthcare systems adapt to the digital age, artificial intelligence (AI) can accelerate the shift to patient-centred care. By streamlining processes, enhancing diagnostic accuracy and personalising treatment plans, AI promises to improve the efficiency and effectiveness of care delivery, leading to more integrated systems and better patient outcomes.¹

Economist Impact's *2023 Digital Health Barometer*, supported by Roche, evaluated the enabling environment for digital health across ten countries: Australia, Brazil, France, Germany, Japan, Mexico, South Korea, Spain, the UK and the US. The report emphasised that well-integrated and patient-centred care should be at the forefront of the digital health agenda to ensure patients:

- receive the right level of care at every stage of the healthcare system;
- do not "fall through the cracks";
- actively participate in their care and shared decision-making;
- have their unique needs, preferences and values considered; and
- are equal partners in a personalised approach to their care.

In this article, we explore how AI is shaping care integration and patient centricity in the Asia-Pacific region, focusing on Australia, Japan and South Korea. These nations feature mature digital and healthcare infrastructure, enabling their governments to explore AI-powered innovations to improve health while maintaining the utmost levels of data privacy and security.



How is AI shaping care integration and patient centricity?

As health systems work to improve care delivery, they must focus on patient-centred care, data privacy and security, and seamless service integration. AI can help to create more connected, coordinated systems, making it easier for healthcare providers to harness data for preventive and therapeutic measures. Its applications in remote monitoring and workflow optimisation streamline processes, while also encouraging patient engagement and increasing the use of services. By integrating AI into healthcare, providers can offer more efficient and personalised care, leading to better outcomes for patients.

Connected systems improve care coordination

Centralised health data, such as information stored in electronic medical records (EMR) or digital notes, are the bedrock of a digital health system. However, simply having these data is not sufficient; it must flow seamlessly to deliver patient-centred care. Australia has made strides

in healthcare data integration through the national My Health Record, which consolidates data from imaging, diagnosis, and treatment to support continuity of care.²

To ensure interoperability between clinical and administrative health data, Australia adheres to international standards for health data exchange, such as the Fast Health Interoperability Resources (FHIR) standard, one of several global health data standards grouped under the Health Level Seven (HL7) umbrella.³ Additionally, data analytics projects such as Pathling, developed by CSIRO, facilitate innovative analysis of FHIR standardised data.

In Japan, efforts to enhance accessibility and sharing of medical information include integrating personal health records through the My Number Card.¹ By 2026, Japan aims to establish a national medical information platform that will enable seamless data sharing among healthcare providers, laying the groundwork for AI-driven personalised treatment plans.¹

“We have a national system called My Health Record, which is a summary medical record containing information such as test results and hospital discharge summaries. It aims to provide **continuity of care for patients.”**

David Hansen, CEO and research director, Australian e-Health Research Centre (AEHRC), Commonwealth Scientific and Industrial Research Organisation (CSIRO).



Similarly, South Korea is developing a nationwide personal health records system that allows patients to access and download their health data, modelled on the US 21st Century Cures Act.⁴ Private companies are working to streamline diverse health data into a common model that supports more efficient analysis.⁵ However, standardisation remains a challenge. Soo-Yong Shin, Head of Research and Chief Privacy Officer at Kakao Healthcare, notes, “There is a lot of data, but it is not standardised across all institutions. This is our big challenge.”

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Once data is integrated, AI can help inform interpretation. “Connecting systems is not enough; we need technology to summarise data from various institutions into interpretable information so that it meets the needs of care providers”, says Takashi Okumura, professor at the Kitami Institute of Technology, Japan. “AI can help with that summarisation.”

One of the main challenges for health systems is the rising incidence of complex, chronic diseases as a result of ageing. Centralised health data provides an essential foundation for enabling healthcare systems to deal with individuals’ complex care needs. Seamless transitions across primary, secondary and tertiary care are critical to prevent disruptions in patient-centred care and maintain hospital efficiency. AI is already being used in emergency departments for triage

and chronic disease management to enhance follow-up care.⁶

In Japan, companies like Almex, a provider of user management and automated payment facilities, are advancing care coordination through AI assistants that manage administrative tasks, enhance patient engagement and triage patients using clinically validated questionnaires and real-time data.⁷ Japan has also adopted integrated care as the predominant model for the elderly population, as outlined in the Community-based Integrated Care System policy.⁸ AI enhances care coordination by facilitating communication among healthcare providers, pharmacies and local governments.¹ The My Number Card initiative, for instance, will improve care integration by allowing information-sharing across entities to avoid duplication. Standardising documentation and streamlining the administrative process can both boost efficiency and cut medical costs.¹

AI can bring healthcare into the home, providing more comfortable and personalised care from the very start of the patient journey. In South Korea, care coordination is evolving with greater participation from the technology industry.^{4,9} “Our ‘digital front door’ platform puts patients at the centre,” says Mr Shin. “Through the communication platform Kakaotalk, patients can make hospital reservations, manage their records and receive tailored recommendations based on their symptoms. It gives them the autonomy to navigate the healthcare system.” Another example is Today’s Health, an app that offers AI and Internet-of-Things (IoT)-based healthcare services for older people. It provides a contactless healthcare model, allowing public health centres to deliver continuous services to elderly residents in local communities. The app connects patients and caregivers, enabling better management of health data and facilitating timely interventions when necessary.¹⁰

Well-coordinated systems help patients navigate through the varied health services they need over time. Australia, for instance, developed tools

to streamline citizens' interface with healthcare. "Healthdirect Australia is a national organisation helping patients navigate the healthcare system, from providing general health advice to providing a symptom checker that will then suggest a relevant healthcare provider," says Mr Hansen.¹¹ However, there is room to expand this integration. "The idea of an AI-based navigator through Australia's rather distributed health system would be a great tool," says Mr Hansen.

Consolidated health information ensures continuity of care and places the patient at the centre of their health journey. "AI's potential is easier to harness in emergency departments due to their independent nature, allowing for straightforward information exchange, unlike the complex integration needed in primary care", says Professor Okumura. However, the scope of AI's applications extends far beyond emergency settings. Once data is gathered and consolidated, it enables the delivery of more targeted preventive and therapeutic care, enhancing overall patient outcomes across the entire healthcare continuum.

Data driving patient-centred care

Care quality depends on high-quality data and analytics. AI can enhance patient care by generating actionable insights from the vast amounts of clinical data produced about patients. By making sense of consolidated health data AI can provide decision support in areas including risk stratification, prognosis assessment, and predictions regarding disease occurrence and treatment efficacy.¹²

In Australia, tools like CSIRO's VariantSpark process genetic information to identify complex phenotypes. Separately, CSIRO research into Alzheimer's disease uses large cohort data to predict clinical outcomes.³ Proactive health data analysis enables healthcare providers to intervene before health issues escalate. CSIRO's AEHRC stresses that predictive analytics can enhance overall healthcare system performance, ensuring that providers can anticipate and

address patient needs.³ Predictive analytics is also useful in identifying patients at risk. "Some of our hospitals have ten years of electronic medical records, and they can use traditional machine learning on that data to do predictive analytics, for example, to identify patients who might be susceptible to sepsis," explains Mr Hansen, referring to the Australian context.

"An early warning [from data analysis] that someone is heading towards sepsis means we can intervene and make sure the patient does not end up in critical condition."

David Hansen, CEO and research director, AEHRC, CSIRO



While Japan has not yet widely implemented predictive analytics in routine practice, research indicates strong potential for developing predictive models for various health needs, including diabetes and new-onset hypertension, as well as using AI to anticipate future healthcare requirements.^{13,14} The government's AI Strategy, introduced in 2022, promotes the development of predictive analytics tools with a focus on early disease detection and intervention.¹⁵

In South Korea, predictive analytics has shown promising results. One tool predicts the health-related quality of life of elderly people with chronic diseases.¹⁶ Elsewhere, machine learning models are identifying risk factors affecting patient outcomes and enhancing the efficiency of triage in emergency departments.¹⁶ Studies using AI to analyse cardiovascular data also demonstrate a commitment to harnessing predictive analytics for proactive health management.¹⁷

As predictive tools become integrated into healthcare systems, they pave the way for advanced remote monitoring solutions that enable real-time patient engagement and continuous oversight of health conditions. Remote patient monitoring allows clinicians to collect and act on real-time information. Wearable devices, for instance, are valuable tools for monitoring physiological parameters like oxygen levels, especially when paired with apps that collect data from these devices.¹⁸

In Australia, mobile health applications are utilised for the management of chronic conditions.³ AEHRC has conducted research into monitoring devices, such as wearable sensors that monitor movement in babies to assist with early diagnosis of conditions such as cerebral palsy. Such efforts support ongoing technology integration, allowing providers to adjust treatment plans based on real-time data.³

Japan has established technologies for remote management of cardiovascular conditions.¹⁹ Remote monitoring of implantable electronic devices has enabled early detection of complications, reducing hospitalisation rates. Systems for home monitoring of chronic conditions, such as peritoneal dialysis, allow patients to effectively manage their health from home, decreasing the need for visits to emergency departments.²⁰

South Korea is exploring remote monitoring capabilities through initiatives such as the Korean Frailty and Aging Cohort Study (KFACS) model, which allows for early detection of frailty among the elderly using machine learning.²¹ Meanwhile, the AI care robot "companion", Hyodol, delivers personalised care for older adults by engaging with them in conversation and gathering data about their daily activities.²² It also creates a 'multi-care network' and connects care providers and these older patients to improve remote monitoring.²³ These advancements reflect a commitment to integrating technology into healthcare, ensuring continuous monitoring and timely interventions.



Workflow Optimisation

Workflows and processes are a major challenge for health systems, where the presence of multiple overlapping bodies and entities leads to complexity, confusion and inefficiencies from appointment management to billing and consultation. Such processes waste the time of a workforce already struggling to balance increasing demand, driven by an ageing population, with workforce shortages. They also impact patients when they lead to errors and inaccurate information. This is another area where AI can help.

Australia is leveraging AI for workflow optimisation. "We are starting to see applications of AI that are not directly clinical, such as managing waiting lists or predicting how many people will turn up at a hospital," Mr Hansen says. "These applications are helping with the administration of the healthcare system and making those services more efficient." AI can also support clerical tasks. Mr Hansen describes using "AI bots to listen in and create notes in the

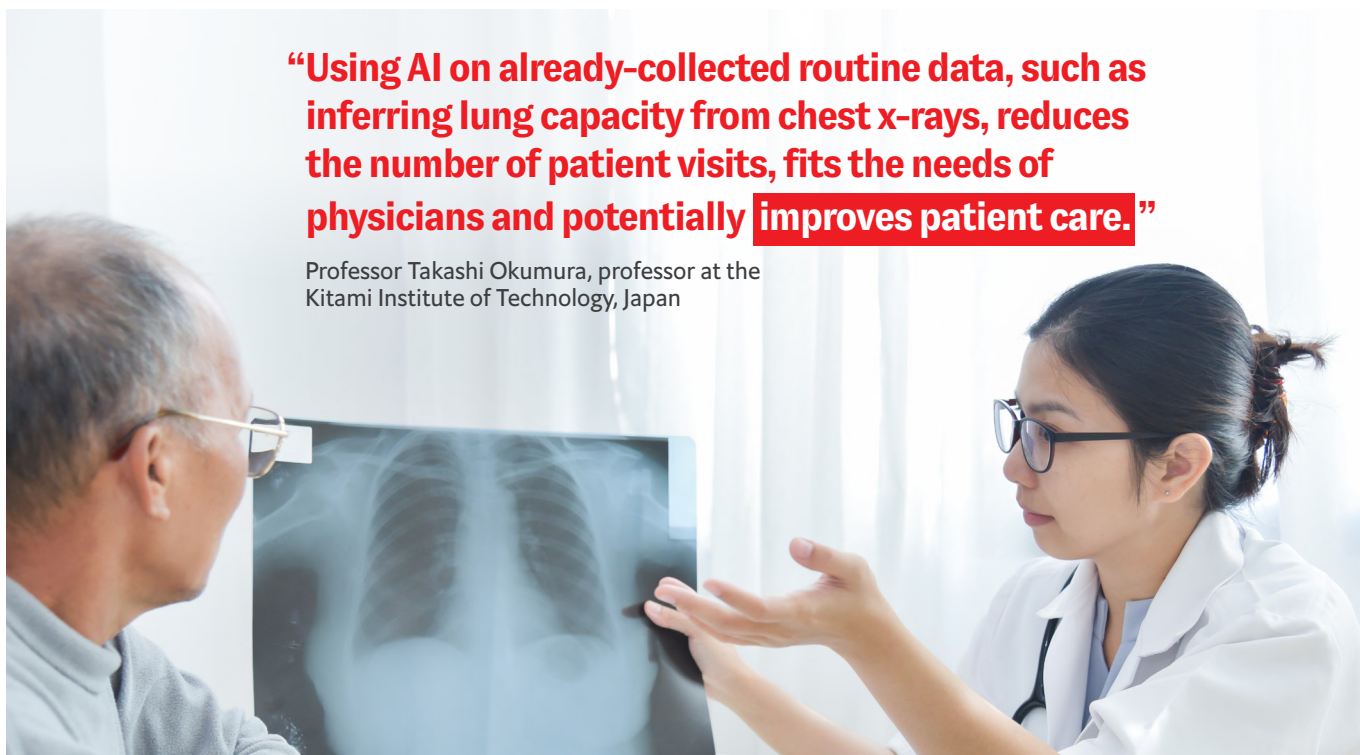
medical record, like a digital scribe," reducing the administrative burden on staff. "Medical staff should still check the notes being added to the medical record," he adds.

In Japan, AI is helping support more accurate and efficient diagnoses, relieving the workforce.²⁴ The country has established frameworks to aid in imaging diagnosis and digital pathology to reduce the workload on healthcare professionals, enhancing care delivery and saving time.²⁵ "Using AI on already-collected routine data, such as inferring lung capacity from chest x-rays, reduces the number of patient visits, fits the needs of physicians and potentially improves patient care," says Professor Okumura.

In South Korea, AI-based medical image analysis systems are currently being rolled out.⁵ These systems, along with automated nursing tools, demonstrate the potential of AI to significantly reduce routine tasks, allowing medical staff to focus on patient care. Some hospitals have even trialled the use of robots to assist with patient rounds and administration.²⁶

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Professor Takashi Okumura, professor at the Kitami Institute of Technology, Japan



Ethical, inclusive AI as the cornerstone of healthcare innovation

The *2023 Digital Health Barometer* highlighted that although digital health technologies can enhance efficiency, accuracy and flexibility, they require robust regulatory and clinical oversight to maintain high standards of care and data privacy and security. Like any innovative technology, AI has the potential to exacerbate potential vulnerabilities around data privacy, security and misuse, which countries must address.

Australia, Japan and South Korea have all proposed ethical frameworks to mitigate risks. Australia's ethical framework for AI is guided by the Therapeutic Goods Administration, which regulates software-based medical devices.²⁷ This is coupled with CSIRO's work on promoting ethical practices and developing national procurement guidelines to balance innovation with regulatory compliance.³ Japan seeks this balance through the Act on Securing Quality, Efficacy and Safety of Products Including Pharmaceuticals and Medical Devices.⁷ Similarly, South Korea's Artificial Intelligence Act

sets guidelines for the development and implementation of AI technologies in healthcare.

Strong governance will be essential to establish and maintain public trust in AI, as well as safeguard against errors and questionable practices. "People are always worried about their privacy and data security, questioning whether their information is being used without permission," explains Mr Shin. "Even after ISO and HIPAA certifications, there is still doubt. That is a major hurdle to overcome."

Governance is vital for ensuring that these technologies benefit all stakeholders. While governments take the lead in regulation and legislation, there is an active role for companies in developing and continuously strengthening their governance frameworks. Mr Shin explains that health companies are used to regulatory compliance, but IT firms - who are entering the field through AI - may not be and will require support to align with regulatory and legislative requirements.

Smarter patients and savvier providers

Even with strong ethical and regulatory oversight, digital health technologies like AI still need to be designed and delivered with users in mind.

The *2023 Digital Health Barometer* found that digital technologies are sometimes not fully embraced by patients or providers. Patients often hesitate to use apps because they find them confusing, and clinicians may lack awareness of AI, be too busy to learn, or even fear the expansion of automation to be a threat to their livelihood. Close engagement with patients and care providers is critical to ensure tools like AI are successfully adopted.

Health literacy is crucial for patients to be active participants in their health. "For patient-centred health, there are two things we need to do," says Mr Shin. "One is to allow patients access to their records and the other is to improve health literacy. We can use technology to nudge people

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Soo-Yong Shin, Head of Research and Chief Privacy Officer at Kakao Healthcare



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Takashi Okumura, professor at the Kitami Institute of Technology, Japan

into thinking about their health in a different, positive way.” Australia is implementing national programmes to enhance digital health literacy by informing the public about AI’s benefits and risks.²⁷ Initiatives like OntoGPT aim to help patients understand complex medical conditions, and efforts are underway to integrate patient voices into professional guidelines.³ Some apps, like South Korea’s Today’s Health app, are helping senior citizens access information more conveniently and focusing on vulnerable populations.¹⁰

Another avenue for improving patient engagement and literacy is through AI chatbots. In Australia, chatbots provide 24/7 support and information retrieval for various physical and mental health conditions.³ Chatbots currently in trial include one designed to assist with pain (Dolores) and another to help with smoking cessation (Quin).³ Mr Shin says that chatbots, harnessing AI, can empower patients. “It is a two-way channel; accepting patient input and then providing [patients] with easy-to-understand health information, which in turn improves their health literacy.”

Deeper clinician engagement with AI is equally important to build trust and ensure effective integration. Professor Okumura stresses the importance of using AI to support clinicians, rather than replacing them. “It is reasonable to use AI to train and support care providers, but not to take the duty away from physicians or replace them. Projects in Japan that attempted to use AI to replace human roles have not succeeded; they must be designed to support care providers.” Mr Hansen echoes this

sentiment, citing an example of how radiologists can use AI to cut the time taken to process an image or use an AI algorithm as a second pair of eyes and a safety net when analysing images, while still retaining the final decision-making responsibility.

With appropriate engagement, healthcare providers will adopt technologies when they see the benefit to their daily work. Training programmes for medical professionals can ensure the workforce is equipped and informed.

So far, there have been different approaches to this process. Japan has relied strongly on academia. “There is increased research funding from the Japanese government for establishing teams at national universities aimed at developing AI and training physicians in AI-related research, enhancing education in medical schools across Japan,” says Professor Okumura. South Korea is initiating education programmes for future AI experts at institutions such as the Health Innovation Big Data Center, a hospital-based programme that aims to develop a skilled workforce capable of commercialising AI algorithms and improving healthcare delivery.²⁶ Countries continue to evaluate their approach. “We’re still working out how to train clinicians in AI,” says Mr Hansen. “At the moment, it’s the more tech-savvy clinicians who are [exploring] with AI, but training will have to come.”

Ultimately, a multifaceted approach to enhancing both patient health literacy and provider training in AI will be crucial for realising the full potential of technology in delivering effective, patient-centred care.

Moving forward on solid foundations

The integration of AI into healthcare offers myriad opportunities. “We’re now starting to understand both the opportunities and challenges with using AI,” says Mr Hansen. What we need to do next, he says, is “to work through governance, implementation, regulations and how to take advantage of it.”

As we continue to explore these avenues, we stand on the brink of a transformative era in healthcare. Guided by ethical principles, this new era promises to foster better patient engagement, improve health literacy and ultimately enhance overall wellbeing while maintaining data privacy and security.



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