How Technology Is Reshaping Care for Older Adults

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Contributor to *Health Progress*

From smart scales that help doctors detect heart failure, to errand-running robots that drop off lab specimens and pick up medication, technology is increasingly finding a role in health care.[1] These innovations help caregivers reduce hospital visits by detecting brewing health problems earlier and freeing up clinical staff from administrative burdens. High-tech tools are particularly valuable for clinical staff working with older adults in long-term care who have multiple chronic conditions. They also help older adults to safely live at home longer.

A new after-hours telemedicine program at Maryville, a long-term skilled nursing care facility in Beaverton, Oregon, shows how tech is reshaping care. Instead of a middle-of-the-night phone call, remote providers now perform a video assessment on an electronic tablet, often averting a trip to the emergency department, said Liz Chua Alcantara, director of nursing at Maryville.

Artificial intelligence (AI) is also becoming a valued tool for team members. At Providence, it helps reduce paperwork and physician burnout, said Dr. Scott Smitherman, chief medical information officer for the employed medical group in the Providence Clinical Network. And wearables like smartwatches, in-home sensors and fall indicators add a layer of connectivity and security for older adults living alone.

In the next decade, technologies that once seemed futuristic, like robot assistants and strength-enhancing body suits, may become more commonplace in U.S. long-term care.[2] However, as the use of technology rises, it's elevating privacy and security concerns, and creating a new time-consuming task: sorting through mountains of digital data. Facilities will need to solve those problems to help technology find its place alongside, not in place of, human caregivers.

"We can't pretend that technology takes the place of relationships," said Dr. Myles Sheehan, a Jesuit priest and director of the Edmund D. Pellegrino Center for Clinical Bioethics at Georgetown University.

CHANGING DEMOGRAPHICS INCREASE NEED

Technological advances are arriving right on time as the nation's health care system faces unprecedented pressure. The number of older adults in the United States is growing rapidly. By 2050, the Population Reference Bureau estimates that there will be 82 million adults aged 65 and older, many of them in need of health support.[3] At the same time, family dynamics have shifted, said Bob Kramer, founder of Nexus Insights and co-founder of The National Investment Center for

Seniors Housing & Care. A growing segment of the population is aging alone. For those who do have family support, work schedules can make it difficult for adult children to care for their aging parents. Assisted living or long-term care are options, but many struggle to afford it.

"There's a huge group that either can't or fears they can't afford to move into a senior living community," Kramer said. Technology that enables people to live at home longer is attractive because it can stretch their dollars.

The COVID-19 pandemic accelerated the adoption of new at-home services, including health care, and these offerings continue to expand. "The home is becoming more capable, connected and convenient than ever before. It offers, in a sense, a virtual form of assisted living where you can curate all kinds of services," Kramer said.

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TECHNOLOGY IN USE

The ability to track patient health remotely is central to home care. Technology gives caregivers peace of mind, monitoring everything from nutrition and medication adherence to ensuring that the patient isn't wandering.

Hospital care is being delivered at home through the Centers for Medicare & Medicaid Services Acute Hospital Care at Home program.[4] Devices play a crucial role in these initiatives. "I think some great examples are things like integrated blood pressure monitors and scales for congestive heart failure patients," Smitherman noted. Having a connected scale can motivate patients to weigh themselves regularly. One study found that detecting body fluid increases using a specialized scale could allow doctors to spot twice as many heart failure events in patients.[5] By catching fluid increases in real time, doctors can reduce costly hospital admissions with an inexpensive intervention.

However, not all home devices provide a clear return on investment, Smitherman said. For example, home blood pressure monitoring is more complex due to the volume of information and the number of patients who need monitoring.

Outside the home, technology also improves patient care in long-term care facilities. Electronic monitoring systems in the medical record at Maryville alert staff members to troubling changes in vital signs or potential drug interactions, Alcantara said. This adds a layer of safety to help ensure nothing is missed during a busy shift. A wound app is used to measure and track healing, and video capabilities provide comfort to families and patients. "If we have a resident who is confused and misses a family member, a video call is very helpful," Alcantara said.

Video technology also allows family members to communicate between visits, reduce transportation costs or be part of a last service or anointing if they can't be there in person. As health care system pressures and costs grow, experts hope that these new tools will provide a bridge to connect people when they cannot be together in the same place.

A TIME SAVER

While many people think of technology in terms of space-age gadgets, some of the most meaningful benefits of this growing electronic revolution are surprisingly low-tech. One scarce commodity it delivers is time. The rise of AI, in particular, is helping to reclaim hours lost to nonclinical tasks. AI can be used to record patient and physician encounters to generate the clinical note for the medical record.[6] Providence is one of the organizations using this technology, Smitherman said.[7]

"We're seeing huge improvements in burnout and even productivity in doctors who are using our AI, ambient scribing technologies," he said. "A doctor that is less burned out and is more focused on you is a better doctor."

It's easy to be distracted by glitzier uses of AI, but getting it to relieve doctors of the daily paperwork slog is just as important, he said. "Before this, for every 10 minutes that doctors spent with a patient, they were spending five minutes doing administrative tasks," Smitherman said. Nurses,

too, spend up to a third of their time on each shift carrying out nonpatient-facing tasks, according to a *Journal of Nursing Management* study.[8]

However, Providence's AI adoption has been cautious. Lower-risk administrative tasks are fair game, but AI isn't allowed to make clinical judgments, Smitherman said. Nonetheless, AI is still playing an important role that could expand over time. "I want to be treated by a doctor who's using AI. I want my family to be treated by doctors who are using AI, both to reduce their burden, but also for things like looking up information," Smitherman said.

MANAGING A GLUT OF DATA

For all the time technology saves, it's also creating new time-intensive challenges. "There was a time when technology was the barrier," Smitherman said. "Nowadays, the problem is more the avalanche of data and how we're going to manage it."

Wearables, in particular, deliver vast amounts of information that's only useful if someone can digest and interpret it, which is not always feasible for a physician at the end of a long workday. New data processing needs raise practical questions, such as how doctors are going to be compensated for the hours they spend poring over this data.

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Roschelle Fritz, a UC Davis Health researcher and associate professor at the Betty Irene Moore School of Nursing, said the answer may lie in solutions that offer a snapshot of patient health trends rather than a deep dive into data. She's researching unobtrusive smart-home sensors in volunteers' residences. The system uses AI to track movement trends and to flag concerning changes.[9]

"When people don't feel well, they move differently," Fritz said. Ambient sensors eliminate the need for wearables and the flood of granular-level data. "We can even get pretty good sleep information with ambient sensor monitoring," Fritz said. "We can't get the different stages of sleep like they do with the wearable sensors. But we can understand whether or not somebody is having interrupted sleep, if there's a change in sleep location, bathroom use, or time spent outside the home. And those are really some of the major things that you look at for management of chronic conditions."

Smart-home solutions may be one way to manage digital overload. Other AI tools could offer another. For example, doctors often don't have sufficient time to review a complex patient's chart prior to an office visit. "All of us would like to think that our doctor spent 30 minutes before you walked in studying all of your records, but obviously that's not the reality," Smitherman said. Eventually, AI could help provide a summary.

RISKS AND DRAWBACKS

The risk of a dangerous error or privacy and security breaches has slowed digital adoption. AI is prone to mistakes. Large language models sometimes generate false information if they can't find a requested answer. These "hallucinations" present unique dangers in health care. A seemingly trivial error in a health care record could be serious if the doctor doesn't catch it, Smitherman said. "You need to balance that against the status quo, where many times doctors were missing stuff in their own documentation," he added.

Facilities should have processes in place to ensure the benefits of technology outweigh the drawbacks. "Here at Providence, we have established an AI guardrails committee that carefully reviews any new product that uses AI for safety, etc.," he said.

Other risks include the potential for bias, which can be inadvertently built into algorithms, and abuse of monitoring devices to essentially spy on patients in their homes. Helping patients understand technology well enough to make informed decisions about its use is also a challenge, particularly for patients who might not be tech savvy, Fritz said.

Technology adoption also risks increasing existing inequities, she said. While tech tools may

be accessible to everyone in a country like Japan with a national health care system, in the U.S. it could create a divide between the haves and have-nots. "Whether or not Medicare pays for something is huge," she said. When technology is covered, it helps ensure equitable access.

MOVING INTO THE FUTURE

These potential pitfalls will need to be addressed as new technologies move into the home and into care facilities. To get a glimpse of the future, look to Japan, Kramer said. The country has one of the oldest populations in the world, coupled with extremely low immigration and birth rates. In recent years, it has had to be innovative to meet the health care needs of its people. As a result, the Japanese long-term care system is on the leading edge of tech adoption. They're using robot companions, exoskeleton body suits, which are wearable robotic devices that increase strength or mobility, and smart adult diapers, equipped with sensors that can tell you not only when someone's soiled or wet, but whether they're dehydrated, Kramer said.

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"Much of the technology that's commercialized in Japan to serve older adults was actually developed in the U.S., but there was no commercial market for it. There was no felt need," Kramer said.

But in Japan, where 60- to 80-year-olds are often caring for people who are even older, technology is essential. An exoskeleton body suit can make it possible for a 67-year-old to care for and lift an 85-year-old, Kramer said. With limited staff, smart diapers can allow workers to work efficiently without constantly checking on residents, he said. One study found that Japanese facilities that used robots to help with patient-related tasks — such as lifting, moving or bathing — and to track and report data experienced lower staff turnover and saw gains in productivity and care quality.[10]

Now facing similar demographic pressures, the U.S. could follow Japan's lead, Kramer said. While many of these technologies, including robots, are just starting to move into the U.S. health care market, it's likely that adoption will move quickly in the next five years, said Fritz.

"Technology is changing so fast, and its ubiquity is deepening all the time," she said.

However, while technology can play an important role in care, it's no replacement for human connection. Treatment decisions still depend on a strong doctor-patient relationship. "You have to ascertain not just what's the biomedical good, but what is the good for that person as a human being," Sheehan said. "Are we respecting true autonomy and dignity and their deepest spiritual needs?"

Human connections are what keep people moving forward, Kramer said. "High tech will not replace high touch. It enables high touch," he said. Facilities and families that adopt technology need to pay close attention to the voices of those they serve. "Listen carefully to the people who are supposedly being helped by the technology to see that they really are getting their biological, psychological, social and spiritual needs met in the way that we would in a regular healing encounter," Sheehan said.

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QUESTIONS FOR DISCUSSION

This article points out that technology can help provide some solutions for people and their care providers as they age, but is no substitute for meaningful interactions or appropriate staffing levels. Both the late Pope Francis and Pope Leo XIV have been clear that technology is effective when it supports humans and their relationships and does not dominate or replace them.

1. What are you experiencing in your work environment related to the use of technology and care for older populations? Are there ways that technology makes it easier for you to focus on improved patient care?

2. Does increased use of technology make it harder to genuinely connect with those you work with and care for? What could your system do to better foster teamwork, collaboration and feelings of belonging?

3. Is your organization planning and budgeting now for technology upgrades? What sort of education, training and shifts in responsibility might you anticipate?

4. As your organization increases the use of artificial intelligence (AI), what guardrails do you have in place to ensure that bias is not present and that all patients have access, regardless of their status or financial resources?

5. As the "loneliness epidemic" deepens in our society, what concerns and hopes do you have about how AI can either worsen or help to lessen this reality?

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