

The Hospital of the Future



During a recent virtual briefing on the Hospital of the Future hosted by Modern Healthcare, industry leaders shared perspectives on the near- and long-term transformation of hospitals and health systems. “Hospital of the future is really a metaphor for healthcare of the future,” said featured speaker Richard Zane, MD, chief innovation officer UCHealth, Colorado Health. Across the board, these stakeholders agreed that tomorrow’s hospitals will be “smarter,” more “connected,” and will better leverage technology to expand access to care, improve operational and clinical efficiency, support sustainability, and advance health equity.

Among the speakers, there was consensus that in coming years more care will be delivered outside the four walls of the hospital or clinic, most care will be provided in ambulatory settings, and innovative solutions for patient care monitoring, patient engagement, and health promotion will be driven by greater integration of technology. “We actually used to say that the hospital was the center of the healthcare universe,” said opening keynote speaker Robert Garrett, CEO, Hackensack Meridian Health. “Today, one could say it’s the cell phone.”

Garrett’s remarks centered around four major strategies that will be vital to health systems in the future:

- Expanding access and innovating care
- Advancing health equity
- Building a workforce for the future
- Reinventing medical education to align with future healthcare needs

“The only way for future healthcare to survive and grow is that we must partner with machines.”

**RICHARD ZANE, MD, CHIEF INNOVATION OFFICER,
UCHEALTH, COLORADO HEALTH**

Hackensack Meridian Health, headquartered in New Jersey, is a large, integrated health network with 18 hospitals, 500 patient care locations, 7,000 affiliated physicians, and 36,000 team members. Hackensack Meridian Health is already deploying advanced technology to address challenges in each of four strategic areas cited by Garrett.

Expanding Access

“COVID-19, the pandemic, made it clear we need a robust digital healthcare system that extends from the doctor’s office right to peoples’ home,” Garrett said. “One of the major trends for the future is creating...a ‘virtual’ front door between patients and the health system.” Hackensack Meridian Health launched its Patient Access Center system in 2021, and has since seen a 15 percent increase in appointments, Garrett said. The health system’s digital front door helps consumers find a provider, service, specialty, COVID-19 test, and more, with most incoming calls handled within 20 to 30 seconds.

In the months and years ahead, Garrett believes that the role of telehealth will expand and that reimbursement will become a standard for both Medicare and private payers. At present, about 15 percent of all visits across Hackensack Meridian Health's medical groups are done through telehealth, Garrett said. However, more than 60 percent of the health system's behavioral health visits are now conducted via telehealth. As demand for these services rises, telehealth is enabling more consumers to access behavioral health services, and telehealth solutions are also helping to mitigate the shortage of behavioral health providers. In another innovative step, Hackensack Meridian Health has opened a behavioral health urgent care center, offering individuals experiencing a mental health crisis streamlined access to care, an alternative to a general hospital emergency department.

As one of the early recipients of a Centers for Medicare & Medicaid Services (CMS) Hospital at Home waiver during the pandemic, Hackensack Meridian Health is continuing its investment in this model. Garrett believes the model is "here to stay" and will be "critical to meet the needs of an aging population." At two health system sites, Hackensack Meridian Health is launching a Hospital at Home pilot for eligible patients with congestive heart failure, COPD (chronic obstructive pulmonary disease), pneumonia, and/or cellulitis. Expectations are that this care model will eventually expand across the health system, Garrett said.

"When I look ahead to the next 5 years, 10, 20, even 50 years, imagine what our health system could look like," he said. "Artificial intelligence will continue to help us bridge the gap to a smarter healthcare system. The role of genomics will transform care delivery profoundly and help us make quantum leaps toward prevention. Remote care delivery will also continue to define the future of healthcare and provide even more connectivity and maybe address the equity issue—[imagine] a day when your ZIP code will not be an indicator of the quality of your health."

Staffing Challenges

Across the country, hospitals and health systems continue to face workforce shortages. "We're all looking for ways to retain, recruit, really re-tool our staff for the future," Garrett said. With the aging U.S. population and the demand for healthcare services on the rise, no one-size-fits-all solution is likely to solve the staffing dilemma. Hackensack Meridian Health is deploying a multi-pronged approach that includes:

- Enhancing salaries and benefits by about \$600 million since the start of pandemic.
- Launching a network-wide employee assistance program that provides one-on-one support.
- Establishing, with the community's help, a Circle of Compassion program that assists team members and families experiencing hardships during the pandemic.
- Creating partnerships with nursing schools and allied health schools to build the pipeline.

- Piloting a virtual nursing program that will use advanced technology to allow some nursing tasks to be handled remotely such as patient observation, care coordination, and aspects of the discharge process.
- Innovating to address workforce shortages.

Some healthcare institutions are re-tooling the hospital work environment by integrating automated solutions and investing in remote monitoring and patient-wearable technology, leveraging advances in these areas to improve care, provide real-time data, and reduce inefficiencies in the existing care environment.

The COVID-19 pandemic increased awareness of the need for and readiness to adopt wider integration of technology in healthcare.

In a discussion on "Leveraging Automation and Patient-Worn Technology to Enhance Patient Care," Angelo Venditti, DNP, RN, executive vice president for Patient Care, and chief nursing executive, Temple University Health System, and Michael Becker, RN, PhD, vice president and chief nursing executive, Masimo, talked about the role of patient-wearables and remote monitoring in the inpatient hospital setting and the potential for patient-worn technology to advance health. Masimo is a global medical technology company that develops and produces leading monitoring technologies, including measurements, sensors, and patient monitors.

Both agreed that the COVID-19 pandemic increased awareness of the need for and readiness to adopt wider integration of technology in healthcare. "We think about innovation differently today than we did pre-pandemic," said Venditti. "We think about the opportunity for technology differently than we did pre-pandemic...It's a real inflexion point [in healthcare]." Becker agreed, "[We are] managing technology like we've never managed it before because it became an essential part of the team."

As an example, Venditti cited the nursing shortage, which he said has been a problem in U.S. hospitals since the 1930s. Hiring more staff will not solve the issue, in his opinion. "Wearable technology, patches to gain information, is really where we need to go. Why? Because it creates a diverse care environment where we can do so much more without shifting the patient from unit to unit or nurse to nurse. We can have that information at our fingertips, and I think that creates a better practice environment for the nurse, whereby we get better outcomes. I think nursing is ready for this as a profession," he said.

Temple University Health System is already using a wide range of technology with complex patients and is partnering with Masimo to roll out wearable-patch technology in some of the

system's intensive care units (ICUs). The technology will support better patient turning and reduce hospital-acquired pressure injuries, Venditti said. He and Becker agreed on the importance of vendors and healthcare clients "innovating together." Becker attributes the success the current ICU project at Temple to the health system frontline staff's comfort level in providing feedback to the vendor. "We each need the other to get the technology to the next level," he said.

While Venditti believes healthcare organizations are ready for increased application of technology to care delivery, he cautions that "cost will play a huge role. Can we get technology that hospitals can consume at an affordable pace? Can vendors and suppliers think about how they supply hospitals differently and really partner with organizations in acquiring technology and working through innovation so that we see an adoption uptick? I think that partnership piece is really important," he said.

Wearables and patch-technology offer opportunities for improving individual health and patient-centered care. "[With] wearable technology and bio-patches...we will have more information visiting our physician—whether that is in person or virtual—than we've ever had. Imagine what that means to wellness, the cost of care, the amount of time it takes to provide care. If you could walk into [the] physician's office with 60 days of vital sign data, and they [the physicians] know what your blood pressure is, and how your weight fluctuates, etc., etc.—imagine the impact we could make," Venditti said.


What will the hospital of the future look like? "[We], as a healthcare community, [will] no longer [be] spending \$1 billion on a building but rather putting \$250 million or \$500 million into technology," Venditti said. "Because while the workflow, and the flow, and the storage, and the office space of the building might be inadequate, I think we're not too far off from hospitals looking much smaller than they do today because of technology. I think we have to ramp up our investment in technology. I also think that just like we measure patient experience, just like we measure quality outcomes, I think there should be standards, and organizations should be recognized for their innovation and adoption of technology."

Intelligence at the Point of Care

Briefing keynoter Richard Zane, MD, chief innovation officer UHealth, Colorado Health, began his presentation by zeroing in on the essence of healthcare: people, processes, and tools. Taking a wider view, he then shared a look at the U.S. healthcare delivery system through the lens of the current era. "[A time where] everything is connected to something else...[an] age of data science...a fundamental age of disruption." Technology—and its rapid evolution—is a driver of disruption to everyday life, from information and knowledge dissemination, to communication, to entertainment, commerce, and education. U.S. healthcare, which at present is not accessible for many, lacks efficiency, and is insupportably expensive—needs to be disrupted as well, he said. In the midst of this age of disruption, we are also experiencing a cognition revolution, where what we are connected to helps us make decisions, he said. (Think about your smart phone,

Siri, GPS, apps, crowdsourcing, and more.) Data science—and its influence on cognition—are powering this revolution, he said. The exponential increase in information today means that "providers are actually encountering seven times the amount of variables and data than a human brain can actually adjudicate at the same time," Dr. Zane said. "The only way for future healthcare to survive and grow is that we must partner with machines."

Artificial intelligence (AI) will help shape the healthcare environment of the future, assessing where humans and human intelligence are needed and where tasks are appropriate for machine intelligence, he forecast. As our partnership with machines in healthcare advances, bricks-and-mortar hospitals will largely provide intensive care and ED (emergency department) services. In the future, most healthcare services will not require hospitals. Instead, the hospital of the future will have a smaller footprint, as increased adaption of technology-enabled solutions leads to a healthcare environment where care delivery is more streamlined, efficient, and affordable, he said.

For the future, "we need to have smart healthcare and smart hospitals. Intelligence at the point of care," Zane said. With greater integration of technology, including ongoing advances in AI, he envisions a future where healthcare is delivered "in bricks-and-mortar facilities, along with virtual, synchronous, and asynchronous communication." Much more than a "virtual" visit, a technology-enabled delivery system will provide care to patients across the entire health continuum, allowing earlier intervention that will prevent not just hospitalizations but suffering. 

Amanda Patton, MA, is a freelance healthcare writer. She worked as a senior writer and editor for the Association of Community Cancer Centers for more than 15 years.

Find a current list (as of 1/31/2023) of the 260 hospitals and 114 health systems in 37 states that have approval for Acute Hospital Care at Home at:

<https://qualitynet.cms.gov/acute-hospital-care-at-home/resources>.