



Post Call: How a pandemic transformed healthcare for the future

One year later, healthcare professionals look back at what went right amidst the trials of 2020 and ahead to a new healthcare ecosystem.



Building a world that works

GE Healthcare spoke with some of the industry's top professionals from around the world—executives, physicians, and analysts—to see how their experience over the course of one challenging year may shape many years to come.

They share their perspectives on lessons learned in 2020: what worked, what didn't, and what must be prioritized today to thrive tomorrow. The hard-earned wisdom of 2020 has led to visions of a new, more resilient healthcare ecosystem—one that is Intelligently Efficient; leverages technology to reduce burnout; expands access with virtual care; and improves data management to strengthen clinical decision making.



I. Apply the principles of Intelligent Efficiency

Inefficiency in health systems is a global problem. The World Health Organization (WHO) estimates that 20–40 percent of health systems' resources are wasted, which undermines service delivery.¹ For public health systems, performance management and efficiency are important priorities, crucial to accelerate progress on health outcomes at times of slow economic growth and healthcare budget limitations.² During the pandemic, healthcare institutions everywhere were forced to reevaluate their operations and proved that tomorrow's healthcare leaders must view efficiency as a process that improves every component of the care system and uplifts every individual who interacts with that system. For some institutions this is already becoming a reality, as they strive for a state in which quality care flows seamlessly and efficiently for providers and patients, guided by relevant insights. A concept termed Intelligent Efficiency.

"What health systems need to work on are the inefficiencies in their system, in front offices, and in the supply chain," says Shereese Maynard, MS, MBA, a healthcare strategist who works with provider organizations, "because that's where you're going to save money without compromising patient care."

Improve operational efficiency with real-time visibility

New technology must help clinicians diagnose earlier, better, and faster using devices that are leveraging artificial intelligence (AI), so healthcare providers can achieve a more precise diagnosis. Virtual assistants saw greater adoption during the pandemic. Accessible via voice or text, mobile smart device, or computer, these technologies enabled physicians to pull up health data, skipping the time-consuming process of looking through electronic medical records.

"If I'm on my bedside rounds and can get all the information I possibly need on my tablet, from lab reports to CT and MRI scans, then the quickness of my response will become much better and easier," says Narottam Puri, MD, medical adviser for health services at Fortis Healthcare, an integrated healthcare provider with 36 facilities in India.

"It is up to our ingenuity and emotional intelligence to determine the fate of technology," he adds. "It can be used to give clinicians more time, so they can devote more time to communicating with patients."

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Command center solutions that orchestrate real-time healthcare

With more patients, fewer open beds, and workflow chokepoints, hospitals and health systems turned to single data infrastructure software known as "command centers," featuring real-time decision support tools. Hospitals are seeing unprecedented orchestration of patient care activity in real time, using apps or "tiles" on a central dashboard. Enabled by AI—including machine learning, natural language processing (NLP), computer vision, and other modes—tiles are built for specialized use cases related to patient flow, quality, risk management, and system optimization. This has led to substantial savings for one hospital as the result of operating at maximum capacity, decreasing average length of stay, and reducing emergency room diversion.³



Photo courtesy of Humber River Hospital

Real-time display of patient data allows clinicians to be virtually there

HCA Healthcare, the largest health system in the U.S., is working on a technology pilot designed to help women in labor avoid complications such as hemorrhage and hypertension. Using a virtual care solution that integrates data from multiple sources, HCA Healthcare created data visualizations and alerts drawing on data from IV pumps, the patients' electronic medical record (EMR), bedside monitors and other devices that remote clinical experts use to observe and provide speedy support to bedside teams remotely. COVID-19 accelerated the wider rollout of the system, in service of better patient outcomes. "We're getting medications to the patients faster, and we're treating problems earlier when they occur, and all of that leads to better care and better outcomes," says Michael Schlosser, MD, MBA, senior vice president, Care Transformation and Innovation, HCA Healthcare. "But it also leads to a more efficiently run hospital."

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Photo courtesy of Oregon Health & Science University

"You don't always need the bigger machines. Portable ultrasounds are easy—some are even designed to fit in your pocket. Many doctors have said it's going to become the new stethoscope." — Sobhi Fares, emergency medical physician, Saint George Hospital, Lebanon

Optimize scheduling to maximize appointments

Millions of patients secure clinical appointments through careful scheduling by healthcare providers, who divide their clinical resources based on availability to maximize the number of appointments. Despite this planning, "no-show" rates of 6.5 percent or higher⁴ are common, and healthcare providers regularly contend with unplanned cancellations and absences.

New predictive algorithms for "smart scheduling" integrate with existing technology and radiology information systems and EMR systems to train machine learning algorithms. The result is cost-effective and clinically relevant scheduling analytics that reduce no-show rates by 70 percent.⁵

Agile, portable solutions for quick diagnoses

In the past year, virtual, mobile, and agile diagnostic aids emerged as key clinical tools in hospitals facing COVID-19 surges. Healthcare leaders saw firsthand how mobile and handheld technologies, including diagnostics, empower clinicians to access data and perform tasks with ease, in a variety of settings. "Things like mobile blood pressure machines, pulse oximeters, and even handheld ultrasounds have been very helpful," says Sobhi Fares, MD, and his fellow emergency medicine physicians at Lebanon's Saint George Hospital know this well. Last year, they worked through the stresses and heartbreak of caring for patients with COVID-19. Then an explosion rocked a nearby port in Beirut, jamming the emergency room with trauma patients. To Dr. Fares, each incident reinforced the need for quick, accurate diagnoses—even when the job seemed overwhelming.

Since then, he has used a portable, streamlined point-of-care ultrasound system to gain lifesaving information swiftly. Diagnoses that once took 30 minutes or more now require mere seconds and can be performed in the hospital, primary care facility, or home.

"You don't always need the bigger machines," Dr. Fares says. "Portable ultrasounds are easy—some are even designed to fit in your pocket. Many doctors have said it's going to become the new stethoscope."

Improve diagnostics and safety by thinking outside the box

Another proven success was a mobile, ready-to-use solution for performing CT scans in emergency situations, a lifesaver during the pandemic. In India and Europe, hospitals employed a CT-in-a-box solution to assess patients with COVID-19, streamlining clinician workflows in the process. With urgent capacity, no time to build a custom room, and the need to reduce risk of infection, they needed a mobile CT solution that could be placed close by—on a lawn or in a parking lot—that could be quickly activated and ready for use. The CT-in-a-box provided a scan room size to rival most departmental scanners and allowed users to maintain scanning, independent from their main radiology departments.

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— Amit Gupta, cardiothoracic radiologist, University Hospitals Cleveland Medical Center, USA

On-device AI for data where, when, and how clinicians need it

Across specialties—from oncology and radiology to cardiology and Ob-Gyn—the availability and adoption of AI-enabled applications is quickly growing, and the beneficial impact is evident in workflow improvements, in triage, diagnostics, and patient management at the point of care.

Today, there are many powerful AI algorithms embedded into medical devices, such as magnetic resonance (MR), CT, X-ray, ultrasound and more, along with applications that can reduce bureaucratic tasks like paperwork, charting, and patient data capture and help make clinicians' daily work more manageable. New features and guided workflows help new users learn the technology faster and use it more effectively.

Amit Gupta, MD, cardiothoracic radiologist at University Hospitals Cleveland Medical Center, who started using AI for pneumothorax detection in early 2020, knows its benefits well: "The role of AI is not to replace radiologists but assist radiologists. Radiologists are a critical part of the success of AI. Now, we can have a second line of defense where the AI tool can help tell us which patient requires immediate attention."



II. Leverage Technology to Reduce Burnout

Nearly two-thirds of doctors surveyed still cite excessive bureaucratic demands as the primary cause for burnout, more than one-third pointed to long hours, and 8 percent of doctors said the stress of treating Covid-19 patients was the primary cause of their burnout.⁶ Just prior to the pandemic, in February 2020, a study found that Ob-Gyn clinicians in the U.S. had some of the highest burnout rates among physicians, with the leading factor being bureaucratic tasks like paperwork, charting, and patient data capture.⁷

But when technology works for clinicians by surfacing actionable data on command, healthcare has a stronger chance to hold on to the people who keep the system running smoothly. In using an ultrasound, for instance, examining the central nervous system of a fetus can require multiple keystrokes.⁸ But a deep learning model built into the device can cut the number of keystrokes by 78 percent, streamlining the process, reducing opportunity for error, and limiting repetitive tasks.

Digitize processes to reduce manual labor.

Dr. Michael Schlosser, Senior Vice President, Care Transformation and Innovation at HCA Healthcare, describes a project in which his team digitized alerts and communications around telemetry, creating a Central Monitoring Unit. At most health systems, technicians and nurses completed the process manually. HCA Healthcare is implementing the new, streamlined system just when nurses need it most. Typically, when technology identifies a patient with arrhythmia, the information is sent to a tech, who calls a nurse and provides the information. Now, the entire process is digitized, devoid of manual labor.

“We have the ability to leverage technology to make sure that the nurses only have to deal with the most meaningful alerts,” Dr. Schlosser says. “It’s taking time off their plates and making things more efficient, so they can focus on patient care.”

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Technology for MR and CT also leverages AI to make imaging faster for both technicians and patients. Intelligent MR slice prescription software uses deep learning algorithms to automatically detect and prescribe slices for routine and challenging knee and brain exams, delivering consistent and quantifiable results. It automates the workflow and optimizes technologist efficiency and reproducible planning to ensure exam consistency for same patient follow-up.

New CT camera-based positioning uses real-time depth sensing technology to generate a 3D model of the patient’s body. Then, using a deep learning algorithm, it pinpoints the 3D center of the scan range and automatically aligns it with the isocenter of the bore. With one click, Auto Positioning uses all of this information to automatically center the patient for a completely hands-free positioning experience and frees up technologists so they can focus on making patients feel more comfortable.



III. Expand the Care Ecosystem with Virtual Care and Telemedicine

In March of 2020, during the early days of the pandemic, the U.S. Centers for Disease Control observed a 154 percent jump⁹ in the number of telemedicine visits in the U.S. What's more, in 2020, virtual care models gained the endorsement of payers, which contributed to the increased use of telemedicine. This rise in virtual care will continue, in part because of positive patient attitudes and experience with telehealth.¹⁰

In Asia, where healthcare systems have long been familiar with SARS outbreaks, hospitals quickly deployed telehealth and remote-monitoring technologies in the face of COVID-19, adds Prof. Ong, of Singapore's Sengkang General Hospital. With a fresh technology infrastructure and integrated data across the organization, clinicians at the brand-new hospital leveraged recent innovations to ensure patients with chronic diseases had access to medications, monitoring, and the appropriate information. "The infrastructure can support a lot of capabilities," Prof. Ong says.

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The COVID-19 pandemic has led to examining the necessary frameworks for supporting wider adoption of telemedicine worldwide.¹¹ Once-underutilized care paths like telemedicine have become popular, sparking new urgency around using digital technology to improve workflows and make systems more productive.

Remote monitoring solutions are fast emerging as a reliable and cost-effective technology to connect ICUs using a hub and spoke model. There are two types of remote monitoring, one connects remote hospitals to those in metropolitan city centers, and the other allows monitoring of ICU beds across the floors of a hospital building at a single location. It enables clinicians advanced consultation, care, and monitoring of their critically ill patients without having to physically transfer them to a super-specialty hospital. This reduces risk of clinical deterioration.



Virtual ICU is extending the critical care expertise of Oregon Health & Science University (OHSU) to patients in rural communities where specialists are not otherwise available. It provides critical care specialists at OHSU with digital tools to deploy hospital-defined care protocols to remotely identify changes in patient status, respond in real time, and support local clinicians caring for patients in their local communities. Their virtual care solution seamlessly integrates and embeds into the workflow of the virtual ICU, which eliminates workflow inefficiencies like double documentation in the EMR; collects and delivers disparate data to clinicians in a single, unified view; and provides real-time analytics and reports to drive continuous improvements and help improve outcomes.

A customized tele-ICU has been deployed extensively in India since the onset of the pandemic. Approximately 800 beds are connected using the solution to enable remote monitoring and efficient care for critically ill patients remotely across the country. Dr. Shailesh Jhawar, Chief Intensivist, Apex Hospital in Jaipur E-ICU Command Center said, "Previously I was able to see 10-15 patients a day. With the capabilities now, we are managing 80-100 patients, so it enhances the quality of the care that we are giving at least by four to five times."

After using the tele-ICU for six months, he noticed that sick patients being treated at the spoke had improved and had enhanced survival. They were even able to free up some beds.

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Decentralize access to patient care

The evolution of virtual care signals a trend: the decentralization of care. The healthcare experts interviewed expect healthcare delivery to occur in an increasingly dispersed manner, delivering care to patients in their homes, outside traditional clinical settings. Accessible technology used beyond traditional hospital walls could further spotlight and help address social determinants of health that strengthen disparities.¹² “The only way we’re going to fix health inequity is if we go back and say, ‘Let’s work on how we’re training doctors and how we’re building out technology solutions,’” says Maynard, the healthcare strategist. One technology solution increasing access to quality care and making it easier for clinicians to examine patients wherever they are, is portable handheld ultrasound. It includes intuitive software, and in a technological leap forward, is completely wireless. Patient data is secured on the device rather than cloud, so an internet connection is not needed, which is critical in emergent situations or in areas with underserved populations that may not have internet access. Handheld ultrasound also has extra processing power that can deliver clear, high-quality images.

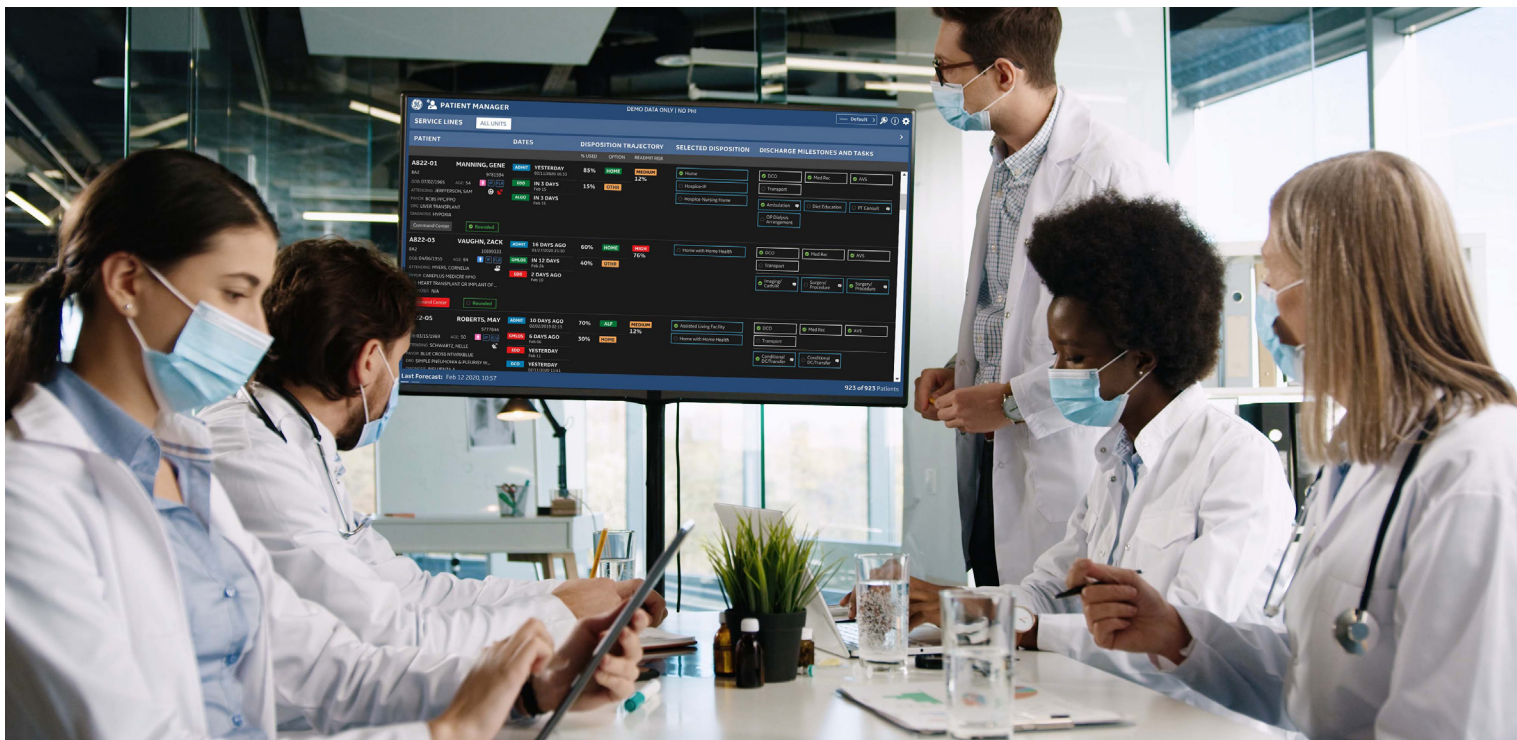
Mirna Salloum, MD, a general practice and emergency medicine physician in Paris, France, often makes house calls. An early evaluator of a new wireless pocket-sized handheld ultrasound technology, she predicts that it will become an indispensable tool. “It’s an amazing machine because it’s wireless, and it’s not heavy. The quality of the image is really amazing. It’s really magic, it’s the future.”

Remote clinical training and support

Another virtual solution that proved key during the pandemic was remote clinical training. This was critical to resolve imaging application issues when clinical support personnel couldn’t come into hospitals. Users connected to a live one-on-one interactive training session with clinical experts to train on and optimize the capabilities of their own equipment.

In India, using on-demand, remote real-time support helped clinicians achieve the best image quality in the shortest time possible and to enhance the quality of scans when needed, without losing crucial time. “The latest software applications are completely utilized by the remote person, he can go through it, navigate it, and give us the best image quality in the shortest time possible on our patients, therefore resulting in better patient outcomes,” said Dr. Pyarelal Chathunny, consultant radiologist, Elite Mission Hospital, Thrissur.

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IV. Improve Data Management to Strengthen Clinical Decisions

Healthcare systems everywhere are overwhelmed by the amount of data they collect, and many don't have the means to turn that information into the valuable insights they need for more efficient care. In fact, 54 percent of hospitals don't have enough data to optimize their costs.¹³

The effective use of data requires changing the way it is stored and used today. Experts say healthcare leaders must revamp the protocols and technologies that silo data and prevent information from informing action. Data integration strengthens clinical decision-making and patient outcomes by providing insights to healthcare professionals when they need it.

"Most of the barriers that keep healthcare data siloed are antiquated," says Abner Mason, founder and CEO of ConsejoSano, which specializes in multicultural patient engagement solutions. "We need to knock them down with a stronger data strategy. That's non-negotiable if the goal is to do right by patients."

Hospitals must craft plans to manage and capitalize on unstructured data, a challenge that existing technology can mitigate. They must look to invest in digital technologies that will help aggregate their data, applying AI and analytics. These new intelligence platforms have been designed specifically to meet the need to take advantage of that data in new and significant ways.

One solution is the implementation of cloud-based systems that can effectively and safely manage the exchange of relevant, real-time data to clinicians across the hospital enterprise, while anonymizing patient data when required. Such systems are being deployed to streamline data gathering, and boost patient privacy and data security.

Large semiconductor chip manufacturers, global cloud platforms and medical technology companies have joined forces to improve the speed and quality of healthcare leading to more productive staff and better care for patients. One chip manufacturer is partnering with healthcare providers to manage data in the cloud that is collected using on-device AI, bringing that information near the patient, and for use to analyze population trends. It puts tools in the hands of the clinician where it receives data, so the clinician doesn't have to take their eyes off the patient.

Global cloud platforms are providing the core cloud infrastructure on which healthcare services can be built. They provide limitless storage, and computational and database capabilities that allows healthcare technology partners, consulting partners, and customers to build services and solutions to service patients. Their partnership with one medical technology company uses a healthcare-specific AI and machine learning environment that allows researchers to look at healthcare data securely and to develop new AI and machine learning models.

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Efficient management of actionable data is essential to delivering high-quality, efficient care. But when COVID-19 struck, HCA Healthcare leadership saw an opportunity to solve lingering challenges for the millions of patients who visit the organization's 185 hospitals and 2,000 care sites. They quickly began standardizing data sets, unifying disparate data sources, and determining how to use insights to aid its hundreds of thousands of physicians and clinicians, in the fight against COVID-19 and beyond.

"We want to take forward our improved focus and use of data and analytics to not only provide better care, but to do so more efficiently," says Jonathan Perlin, MD, PhD, president, clinical operations, and chief medical officer.

"This crisis has forced accelerated learning and greater focus on the use of data to improve care," Dr. Perlin adds. "And the capacity to focus and accelerate has allowed us to deploy technologies faster."

With actionable data, the application of technologies like AI across the entire patient journey can help achieve precision healthcare that's integrated, efficient, and highly personalized.

Advance Healthcare with Strategic Public-Private Partnerships

Health systems can't do this alone, they must partner with industry experts who can act as the integrator of these data sets, helping providers take advantage of data in new and significant ways, helping to make precision health a reality that delivers, capacity, productivity, and patient outcomes.

They must create a new ecosystem, one that leverages the strengths of clinicians, technology partners, academics, and others to advance healthcare together. Public institutions and private healthcare organizations across the world have been relying on collaboration. Jesus Rueda Rodriguez, director of general strategies, special projects, and international affairs for MedTech Europe, a European trade association representing medical technology industries says the road ahead might be bumpy, but we can expect a greater focus on innovative data partnerships. "Public-private partnerships are going to be essential in showing everything that we can leverage and how effective we can be," he adds.

Holistic partnerships with vendors can drive the development of new technologies. As COVID-19 lockdowns took hold and suppliers reimaged how they serviced existing and future clients, their relationships turned virtual, delivering remote support to the right people at the right moment.

A large university health system in the US worked with GE Healthcare to create virtual care software and other technologies to care for critical care patients, not just in their hub hospital, but in satellite hospitals across the entire region. During COVID, it allowed the care of critical patients remotely, so the clinician didn't have to be bedside to provide quality critical care. Another example was a partnership between GE Healthcare and a research team at the University of California, San Francisco to develop technology to detect collapsed lung and the positioning of breathing tubes. As a result of the partnership, they were able to rapidly adapt those for COVID patients, to reduce exposure of healthcare personnel to potentially high-risk situations, to make care for patients faster and more efficient, and diagnoses quicker.

In the UK, the University of Oxford-led National Consortium of Intelligent Medical Imaging (NCIMI) is bringing together a wide range of academic, clinical, and industry expertise into one sustainable ecosystem to address unmet needs in AI. One of these collaborations with NCIMI is developing and testing algorithms to aid in the diagnosis and management of COVID-19 pneumonia.

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Conclusion

The COVID-19 pandemic brought many trials and tribulations to an already overburdened sphere. But it also brought opportunity for those leaders who were able to modernize and improve their healthcare ecosystems, accelerating transformations in the making and offering a glimpse into the future of healthcare.

The transition to a data-driven health ecosystem is about improving outcomes by finding new ways to reach and treat patients, while creating capacity for providers, and making precision health a reality. To achieve this, health systems must continue to prioritize digital innovation. It will be essential for responding to patients' expectations for greater expediency, access, and convenience.

If they do so, the experiences and insights of the experts featured here show that the future of healthcare is filled with promise for providers and patients alike.



Notes

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⁵ Smart Scheduling reduced no shows by 70% from 4.6 to 1.2% at pilot sites over a six-month period. Results cannot be guaranteed

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