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Healthcare Technology Trends for 2024 and Beyond

An Evolving Healthcare Landscape

Healthcare is an industry that has balanced technological innovation at the bleeding edge with an evidence-based approach to clinical technology implementation. As a result, certain technology advancements may take years to be implemented into practice as they're put through rigorous testing and clinical trials.

Even for non-clinical use cases, healthcare systems have often been slower than other industries to adopt new technologies in order to enhance patient experience and operational efficiencies. But that paradigm is changing. Between a historic labor shortage, declining reimbursement rates, the increasing consumerization of healthcare, and a new raft of emerging cybersecurity threats, the pace of technology adoption in healthcare is rapidly accelerating.

In this report, we'll unpack how technology leaders in the healthcare space are rolling out initiatives across functions:

- **Patient experience:** Discover how evolving patient expectations are driving healthcare providers to embrace digital solutions, enhancing care and connectivity for a seamless patient journey.

- **Data and analytics:** Learn about the transformative power of data analytics and AI in unlocking valuable insights, optimizing healthcare delivery, and pioneering personalized treatment plans.

- **Generative AI:** Explore the cutting-edge potential of generative AI in revolutionizing healthcare through synthetic data creation, accelerating drug discovery, streamlining provider workflows and refining diagnostic accuracy.

- **The Internet of Things:** Uncover how IoT technologies are enabling smarter operations and workflow optimizations, providing actionable insights and improving patient care both in hospitals and at home.

- **Cybersecurity:** Understand the critical importance of robust cybersecurity measures to help protect sensitive patient data amidst an increasingly digital and interconnected healthcare landscape.

Let's dive into the technological innovations reshaping healthcare, highlighting the opportunities and challenges that lie ahead in this rapidly evolving landscape.

Elevating Patient Experience

Patients are no longer passive recipients of care. They are active participants engaged in their own healthcare journeys—a phenomenon that is directly shown to improve individual health outcomes.

But achieving that engagement isn't easy. Amid a rising trend of healthcare consumerism—as patients expect the same level of choice, convenience and personalization they experience in other aspects of their lives—providers are prioritizing patient experience initiatives that humanize care and create meaningful interactions both inside and outside of traditional care settings.

Fostering Loyalty through Cutting-Edge Experiences

Meeting these new expectations requires a new set of digital solutions. Technologies that once seemed futuristic are now at the forefront of transforming the patient experience. Patient portals empower individuals to access their medical records, schedule appointments, and communicate with providers from anywhere. IDC predicts, meanwhile, that by 2028, personalized health data platforms will support 75% of patients in advanced economies, creating more accurate and comprehensive patient journey simulations. This digital shift enables providers to offer care that is not just reactive but proactive, preventive, and personalized, leveraging data analytics to tailor health recommendations and treatment plans to individual patient needs.

Telehealth and digital health platforms are prime examples of how technology is being leveraged to enhance patient engagement, from anywhere. The convenience of accessing care from the comfort of one's home, coupled with the ability to maintain continuous communication with healthcare providers, exemplifies the industry's move towards a more patient-centric care model.

Moreover, healthcare leaders are increasingly adopting interactive educational tools and virtual reality (VR) for patient education and therapy. These technologies not only make healthcare more accessible but also more engaging, especially for younger generations who are accustomed to digital interaction.

Market Forces Driving Technology Innovation

The consumerization of care: Patients seek convenience, personalization, and seamless experiences—attributes that haven't traditionally been associated with healthcare. Meanwhile, digital disruptors like Amazon, CVS, and Walmart have entered the healthcare arena, forcing providers to elevate experience.

Labor pressures: The **30,000 doctors** entering the U.S. workforce each year aren't nearly enough to replace the number retiring or reducing clinical hours. Experts expect the shortage of physicians could climb as high as **86,000 by 2036.** Remaining staff are being forced to do much more, with much less.

Cybersecurity threats: Hospitals' attack surfaces are growing, and bad actors are growing more sophisticated, aided by technology like generative AI. In healthcare, breaches cost big money. In 2023, the healthcare industry **reported breaches** that cost on average $10.9 million.

Rapid advancement in AI technologies and solutions: Healthcare organizations are starting to harness the enormous potential of AI technologies. Solutions are being tested and rapidly adopted across the care continuum—from clinical note capture through voice-to-text models to image recognition and analyses in imaging diagnostics; from medical research summarization to large data set analytics for revenue and risk management.

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Enhancing the Visitor Experience in Healthcare Environments

Within the four walls of the hospital, care leaders are also striving to make their facilities feel like an extension of the home—both for patients and their visiting families. This means ensuring reliable connectivity for patients and their loved ones to access WiFi, entertainment, and virtual communication platforms during visits or stays.

High-speed WiFi and low-latency networks have become fundamental in facilitating these environments, enabling families to stay connected to their support networks, access entertainment, and, most importantly, remain in constant communication with medical teams. This level of connectivity supports various digital interactions, from virtual visits to real-time updates on patient care, making the healthcare journey more inclusive and less isolating for patients and their families alike.

The Future of Care at Home: Expanding Possibilities

The shift towards home-based care is rapidly gaining momentum, driven by advancements in telemedicine, remote patient monitoring, wearable technologies, and IoT devices. The Hospital-at-Home model, growing slowly over the last two decades, went mainstream during the pandemic. Providing acute-level hospital care at home using in-person or remote monitoring, home care is rising as a means to control healthcare costs, mitigate staffing shortages, enhance patient experience, decrease readmission rates, and even improve health outcomes.

As Hospital-at-Home models continue to grow, so too will relevant technology investments. IDC predicts that "by 2027, a doubling of hospital-at-home patients will propel a 55% growth in investments in tech-enabled integrated care initiatives to address patient safety, workforce shortages, and care access concerns."

Ensuring equitable access to these at-home technologies and addressing social determinants of health (SDoH) are important issues to consider. According to IDC, 60% of healthcare organizations will shift priorities by 2027 to focus on tech partnerships that champion "techquity," reducing the digital divide and recognizing social determinants of health.

Achieving this level of care outside traditional healthcare settings demands an unprecedented focus on connectivity. Secure and reliable networks are the backbone of telehealth and remote monitoring services, enabling healthcare professionals to deliver care effectively, regardless of physical distance.

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SOURCE: IDC FutureScape: Worldwide Healthcare Industry 2024 Predictions

By 2027

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SOURCE: IDC FutureScape: Worldwide Healthcare Industry 2024 Predictions

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As Analytics Transform Healthcare, Data and Connectivity Are At the Forefront

Healthcare providers sit on vast stores of data: clinical data, patient profiles, operational information, and much more. Given the walled garden nature of electronic health record (EHR) systems, a myriad of legacy systems and databases still in use, as well as the stringent data protections in place regulating the healthcare industry, hospitals and healthcare systems have been traditionally unable to put that data to its highest use.

But when consolidated and leveraged, that data holds tremendous power. It can be used to enhance diagnoses, predict health risks, recommend optimal treatment paths, and drive operational efficiencies. By leveraging advanced data analytics and artificial intelligence, healthcare providers can unlock valuable insights from the immense volumes of patient information they collect. Capitalizing on these opportunities, however, requires networking and data processing strategies and solutions that can handle the intense data demands.

Unleashing the Power of Data Analytics

Data analytics offers a lens into the complexities of healthcare, from patient diagnostics to operational efficiencies. The adoption of AI and machine learning technologies is propelling this forward, enabling providers to parse through vast datasets to uncover insights that drive better care decisions and predict health trends. However, the foundation of these technologies' effectiveness lies in their ability to access and analyze comprehensive, relevant and accurate data in real-time, which is only possible through the secure and rapid flow of information among applications and departments. Advanced networking has emerged as a key tool to enable rich analytics, allowing, for example, application aware network traffic to ensure that analytics applications and AI inference workloads can be accessed optimally, without interrupting other critical healthcare services.

The opportunities created by AI algorithms are driving the need for better data and real-time access. Machine learning models can rapidly analyze large datasets to identify subtle patterns and anomalies that may go unnoticed by human experts alone. This capability is enabling more accurate diagnoses, earlier disease detection, and the development of personalized treatment plans precisely tailored to each patient's unique genetic profile and health markers. IDC predicts, in fact, that care providers will see a 60% increase in AI solution adoption by 2025—all driven by the need for improved diagnostic accuracy, speed, and workflow efficiency.

By 2025

60%

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SOURCE: IDC FutureScape: Worldwide Healthcare Industry 2024 Predictions

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Automation to Enhance Operations and Experience

As healthcare organizations grapple with a historic labor shortage, they are looking to investments that help them both close that gap and reduce manual burdens for doctors and nurses. In fact, 36% of healthcare organizations say the availability of skilled workers is the main external factor shaping their business goals. Automation is a key tool in that effort, but AI-driven automation relies on available, connected data. By automating routine data capture, analysis and reporting tasks, healthcare providers can allocate their focus more on interpreting results, spending more time with patients and making informed decisions. This not only enhances operational efficiency but also allows for real-time insight generation, and a better patient experience, crucial for responsive and adaptive patient care.

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SOURCE: Gartner, 2024 Tech Trends in Healthcare: Insights to Attract and Retain Software Buyers

Generative AI's Power and Potential

While the new opportunities created by data analytics, artificial intelligence, and machine learning have been underway in medicine for years, the ongoing adoption of generative AI is continuing to create never-before-seen opportunities. From the creation of synthetic data for algorithm training to the acceleration of drug discovery, to improvements to imaging quality, the use cases are vast. But there's no easy roadmap—healthcare tech leaders may be challenged to keep up with the pace of innovation while developing and deploying their AI strategies.

Innovations in Payment Technology

The impact of GenAI on healthcare efficiency will indeed be profound. IDC predicts that as early as next year, generative AI technologies will liberate up to 15% of clinicians' time, translating into an estimated $350 billion in annual global healthcare savings. This shift will usher in greater workflow automation, streamline operations, alleviate provider burnout, and allow healthcare professionals to focus more on patient care than administrative tasks. Some 60% of global healthcare organizations are projected to double down on their GenAI commitments by 2026.

Generative AI's ability to create realistic synthetic data for training other AI/machine learning algorithms can help overcome hurdles like data scarcity and privacy concerns around using real patient data. Synthetic data produced by generative AI could accelerate development of AI models for drug discovery, diagnosis, and clinical decision support without compromising safeguards.

Generative AI's viability, however, hinges on the availability of robust, high-performance computing and network infrastructure. The computational demands of GenAI applications are substantial, requiring sophisticated data processing capabilities and storage solutions. As such, at the same time they are making heavy investments in generative AI itself, healthcare organizations must also prioritize the development of advanced IT infrastructure that can support intensive data and computational needs.

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Revolutionizing Healthcare with GenAI

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Generative AI could save as much as 15% of clinicians' time by 2025.

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SOURCE: IDC FutureScape: Worldwide Healthcare Industry 2024 Predictions

IoT for Smarter Operations

Healthcare leaders are increasingly turning to The Internet of Things (IoT) as both a source of data and actionable insights—as well as a means to put those insights to bear in real-time. From tracking equipment and managing inventory to monitoring environments and streamlining workflow, IoT technologies are helping providers achieve new levels of operational efficiency.

Device Insights Inside (and Outside) the Hospital

IoT devices are quickly becoming ubiquitous in every healthcare environment. Within hospital facilities, IoT sensors can monitor temperature, humidity, air quality and other environmental factors to ensure optimal conditions for patient care and staff safety and comfort. Connected biomedical devices—leveraged in the hospital or in Hospital-at-home settings—can automatically upload data to patient records. RFID asset tracking tags allow real-time location monitoring of critical medical equipment to avoid misplacement.

Meanwhile, IoT can enable smarter inventory management by providing real-time supply chain visibility. RFID and IoT sensors can automatically detect low stock levels for medications, supplies, and equipment, triggering restocking alerts to avoid outages. This level of operational intelligence helps reduce waste, cut costs, and ensure critical resources are always available.

For healthcare's mobile workforce, IoT wearables help track staff locations and activity levels to optimize scheduling and ensure enough resources are deployed to meet patient needs across a facility. IoT environmental sensors in ambulances can monitor factors like temperature control of medication storage.

Edge computing, 5G, and software-defined networking all play a role in this smart, connected healthcare operations environment. Robust cybersecurity is also paramount to protect this proliferation of IoT devices and data streams from threats.

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Healthcare's Cybersecurity Imperative

Unfortunately, healthcare organizations have become an attractive target for bad actors. In the last half decade, there has been a staggering 256% increase in hacking-related breaches and a 264% jump in ransomware attacks in healthcare.

Electronic health records, connected IoT medical devices, telehealth solutions, and other new data streams are exponentially expanding healthcare's attack surface area. At the same time, strict data privacy regulations like HIPAA are being enforced with significant non-compliance penalties. Investing in robust cybersecurity has shifted from an IT priority to an overarching clinical and operational imperative. And finally, generative AI and ease of access on the dark web have made more sophisticated attacks readily available for attackers.

Healthcare organizations need comprehensive, multi-layered security strategies that protect patient data across the entire digital attack surface—from edge IoT devices and mobile, all the way to data centers and clouds. This includes deploying threat detection, encryption, endpoint detection, and other advanced cybersecurity technologies.

256% ↑
Five-year increase in hacking-related breaches in healthcare

264% ↑
Five-year increase in ransomware attacks in healthcare

SOURCE: U.S. Department of Health and Human Services Office for Civil Rights

Payviders and the Need for Tight Security

Healthcare is also witnessing the rapid emergence of "payviders"—entities that merge payer (insurance) and provider (care delivery) functions. This model, aimed at streamlining care delivery and enhancing cost-effectiveness, is gaining traction. By 2026, according to IDC, 55% of worldwide private health insurance companies and 75% of U.S. health systems will adopt payvider models to mitigate risk and better manage the cost of care.

Payviders rely on data exchange and communication between and among healthcare entities, further expanding potential attack surfaces and making safe data exchange a prerequisite of operation. The interoperability of systems, while maintaining the highest standards of data protection, poses a unique challenge, requiring sophisticated cybersecurity frameworks and secure data transmission protocols.

Envisioning Healthcare's Tech-enabled Future

As healthcare organizations navigate an evolving landscape, the integration of advanced technologies and robust cybersecurity measures will be paramount in delivering care that is not only effective and personalized but also secure and resilient.

Looking ahead, healthcare leaders have myriad opportunities to redefine patient care and operational excellence. The key to unlocking this potential lies in harnessing the power of digital innovation, ensuring that technology serves as a bridge to the future of healthcare, where care is personalized, every endpoint is secured, and every process is optimized.

$10.9 million
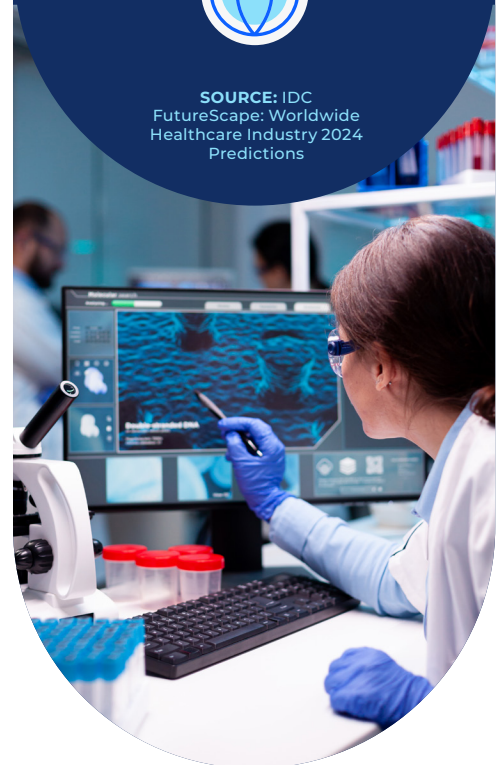
The average cost of a healthcare data breach in 2023

SOURCE: World Economic Forum

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