



# IoT: The Key to Improving Patient Outcomes Through Connected Healthcare

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More than half of all U.S. hospitals are investing in connected healthcare and telemedicine programs to expand services to patients located in geographically removed areas. Unfortunately, patients in remote areas of the U.S. have limited access to healthcare services and are disproportionately older and sicker. In addition, they often have lower incomes and are less likely to be insured.

Connected healthcare programs, which include a growing variety of IoT-enabled applications and services designed to enable clinicians to provide care remotely, are helping to connect these patients with healthcare services. Utilizing IoT-powered technologies such as out-patient tracking and monitoring applications, connected medical devices, and home healthcare delivery solutions, clinicians are able to bridge physical distance to provide high-quality care and improve outcomes.

Connected healthcare is also being used to improve patient outcomes after discharge from the hospital, helping to prevent readmissions by enabling providers to monitor patients at home. If a patient is readmitted within 30 days for the same issue, Medicare and Medicaid will not reimburse the provider. This provision is intended to motivate providers to focus on improving patient outcomes while controlling costs – which the fee-for-service model of healthcare struggled to do.

There are many new IoT solutions entering the market that arm healthcare providers with the tools

necessary to create improved treatment plans for remote patients with a variety of conditions including diabetes, high blood pressure, and various cardiac ailments. These IoT-enabled devices have the ability to gather physiological data and link that data to a patient's electronic medical record. Other IoT healthcare solutions allow physicians to conduct virtual patient visits, as well as access and upload cloud-based patient data regardless of location.



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In order to realize all of the potential benefits of connected healthcare, such as reduced costs and increased convenience, healthcare providers, legislators, and solution providers need to work together to perfect and expand existing programs and introduce new offerings.

Healthcare is a notoriously fragmented and highly regulated market, and IoT solutions in the space still face a number of legislative as well as technical hurdles. The technology associated with connected healthcare must be easy-to-use, reliable, comply with regulatory requirements, and integrate well with clinical workflows in order to address institutional and patient needs. Successfully navigating the complex IoT ecosystem to deploy the right mix of technologies, system architectures, and service approaches is the foundation for the growth of the connected healthcare market.

### Arming Patients with Technology

There are a number of disease states in which IoT is already revolutionizing care, giving patients deep insight into their own conditions and empowering them to manage their healthcare from anywhere. Here is a closer look:

- **Diabetes** – Patients now have access to stationary, wearable devices that automate the management of glucose levels as well as implantable and ingestible devices that both monitor glucose levels and deliver insulin. The development of bionic pancreases could also prove to be a major breakthrough in managing diabetes.
- **High Blood Pressure** – With the advent of IoT, there has been great attention paid to smart blood pressure gauges that easily and accurately take measurements over extended periods and securely transmit the results via smartphone to patients, doctors, or caregivers.

This data is valuable to patients and helps physicians more accurately prescribe necessary care during check-ups. Other IoT healthcare applications adjacent to telehealth include:



- Elderly tracking devices that help caregivers to locate patients quickly, reducing the risk of accidents.
- Home labs equipped with connected “wands” present the ability to take a biological sample through blood, saliva, or nasal swabs to detect any number of health-related issues such as the flu, fertility, or vitamin D deficiencies.

At an even broader level, there are now emerging trends in medication compliance, drug effectiveness, and patient behavior that can help to improve the overall patient experience, deliver better care, and drive improved outcomes.

### Deeper Technology

The technology associated with patient-utilized IoT solutions must be easy to use, reliable, and secure. In many cases, they are directly linked with healthcare providers, which must also satisfy regulatory requirements and integrate well with clinical workflows in order to address institutional and patient needs. Ensuring that all IoT capabilities are in place - ranging from strategy development, to connectivity and carrier management, to network and security management, among others - provide a strong foundation for growth in this market.

Our increasingly connected world is transforming healthcare in ways no one could have imagined, while satisfying the aforementioned requirements. Technical innovations enabling the expansion of telemedicine include:

- Cloud-based platforms with open APIs
- Highly developed security protocols and technology
- The spread of cellphones and tablets powered by 4G LTE and Wi-Fi
- Failover solutions limiting potential downtime, should an outage occur
- Sensors and networks supporting the IoT
- Services such as data analysis, AI, automation, and virtual reality

Although the increasing availability of IoT technologies is helping to make connected healthcare a day-to-day reality, there is a high level of IoT ecosystem complexity that must be addressed to ensure these programs are successful.

Healthcare IoT solutions depend on reliable, secure connectivity as data needs to flow from various endpoints (RFID, NFC, beacons, tablets, watches, etc.) to the cloud or enterprise systems that process, correlate, analyze, and generate insights from the raw data these devices generate.

As connectivity, device, and data analytics become more sophisticated, and IoT providers make these solutions more accessible, healthcare IoT adoption - especially in rural areas where resources may be prohibitive - will continue to grow.



### Key Considerations for Success in Connected Healthcare

Connected healthcare device manufacturers need to think about how their connected product ecosystem will work across the globe. It is important that manufacturers are able to minimize risk and speed time-to-market in order to achieve a competitive advantage. Considerations include: How is the device connected, procured, stage-kitted, delivered, and managed throughout its lifecycle?

As an example, think about an IoT-connected pacemaker:

- The device manufacturer knows the technology and requirements for the pacemaker, but might not know the technology and requirements for the appliance that connects to the device, making it “smart” (essentially a dedicated tablet or smartphone).
- The manufacturer needs to get the appliance procured, ensure it works in all required geographies, and plan for the lifecycle of the appliance as well as the device.
- As a result of this added layer of complexity, manufacturers are increasingly seeking out experienced IoT solution providers that recognize the importance of a secure supply chain from device to network through to application.

#### Security

Based on the use case, configuring appliance settings and security policies for inclusion in a medical solution can vary. However, in every case, the manufacturer needs to establish what the policies are, how they are implemented, and the frequency with which the device is audited to ensure vigilance.

#### Operations

Healthcare IoT telemedicine device manufacturers are also faced with managing new layers of operations, including application, network, and device performance and security. In this new business-to-business-to-consumer model (B2B2C), someone has to manage every single point of interaction, point of value, and point of information control.



#### Lifecycle Events

Planning for the connected side of the product’s lifecycle also requires thought and attention. How does the manufacturer manage warranties or recalls? How does it build an operational model, validate it, and optimize it? For every new technology, the manufacturer must consider the associated installation, post-installation, and recall needs.

#### Logistics

There are a lot of moving parts, and device manufacturers must take into account the forward logistics of both the device and the appliance. They need to consider demand forecasting and who manages relationships with the appliance manufacturer, then build the pre-production plan, validate it, run the pilot, and create the production model.

### Leveraging Expertise to Plan and Execute Go-to-Market Strategies Faster

The benefits of healthcare IoT solutions, including reduced ER costs and improved patient care, promise to change the experience and delivery of healthcare. Many IoT applications for telemedicine are currently emerging, with more are expected in the next few years. Those looking to succeed in this complex, fast-moving environment need to commit resources and partner with best-of-breed IoT service providers in order to create sustainable long-term solutions.

IoT solution providers must also recognize the importance of a secure supply chain, understand and participate in security, operations, lifecycle, and logistics. KORE offers technology-agnostic IoT solutions that tightly integrate edge-devices, big-data applications, and analytics into a unified ecosystem, purpose-built to solve industry challenges.



#### About KORE

KORE is a pioneering leader and trusted advisor that helps deliver transformative business performance from IoT solutions. We help customer organizations of all sizes navigate the complexities of IoT and improve execution, so they can focus on operational and business results. Our IoT expertise and experience, global reach, independence, and deployment agility accelerate and materially improve our customers' return on their IoT investments.



Learn how KORE can leverage complete IoT management capabilities to help your organization navigate the complexity of IoT and achieve transformative business performance.