KORE

IoT in Healthcare: Transforming Patient Care with Three Key Use Cases

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IoT is becoming a disruptive factor in the Healthcare industry – a statement that is agreed upon by 73% of healthcare executives[12]. A market that is expected to grow to $158B by 2022[13], healthcare IoT provides the technologies needed to automate, enhance, and mobilize legacy medical processes and solutions, truly transforming and improving the ways that patient care is delivered.

Out Patient Monitoring

mPERS (Personal Emergency Response System)

Remote Workforce Monitoring

IoT in Healthcare

Here are three use cases that represent the most promising opportunities for improving patient outcomes with healthcare IoT implementations.

1. MOBILE PERSONAL EMERGENCY RESPONSE SYSTEMS (mPERS)

The global population of people aged 65 or older is expected to reach nearly 1.5 billion by 2050 as there have been significant improvements in life expectancy and healthcare delivery over the last 50-100 years[2]. People are living longer, working longer, and determined to maintain their independence longer, with 87% of adults aged 65+ in the United States choosing to stay in their current home and community as they age[3]. With many of these older adults living alone, **more than 40% of seniors said they would be likely to use fall detection or location tracking solutions to ensure their safety and security**[4].

mPERS solutions represent the fastest growing segment of an expanding PERS marketplace, providing aging adults or other at-risk individuals with a wearable, push-button system connected to a call center service to signal the need for urgent, emergency attention and call for assistance. PERS solutions traditionally relied on landline connections to facilitate the medical response service, however IoT technologies and emerging wireless connectivity options are providing people with more flexible options, enabling them to live more independent, healthy lifestyles.

The Personal Emergency Response System (PERS) market is expected to grow from $6.61B in 2017 to $9.22B by 2023, with the mPERS segment expected to grow at the highest CAGR during the forecast period[1].

1. MOBILE PERSONAL EMERGENCY RESPONSE SYSTEMS (mPERS)

Next-gen, IoT-enabled mPERS solutions deliver much more than just mobility for end users, and go beyond the simple "panic button" concept to provide services including automatic fall detection as well as navigation guidance or boundary perimeter alerts for patients with Alzheimer's or dementia. **These solutions are now available in a variety of different form factors (i.e. pendant, wearable watch, wristband, clip-on device, etc.)** which are GPS capable and embedded with accelerometer sensor technologies to provide the aforementioned enhanced people tracking capabilities.

For healthcare providers, there are significant benefits associated with offering patients mPERS solutions, and they can often be implemented as an extension of existing mHealth, telehealth, and connected home solutions to enable emergency response capabilities. mPERS devices are designed to work with specific applications with targeted off-the-shelf options available. The mPERS IoT ecosystem can be challenging to navigate, though, as solution capabilities, coverage areas, etc. vary greatly from provider to provider.

2. OUT-PATIENT MONITORING

Hospitals and other healthcare clinics and organizations are under pressure to reduce unnecessary patient readmissions, which not only contribute to a negative patient experience but also pose a significant financial threat. **In fact, the cost of treating patients that are admitted within 30 days of discharge is estimated at $41.3 billion annually**[6]. The leading cause of preventable readmissions is the recurrence of a chronic issue that led to the initial hospitalization, which is why healthcare providers are increasingly leveraging IoT-enabled patient monitoring solutions to better manage these conditions.

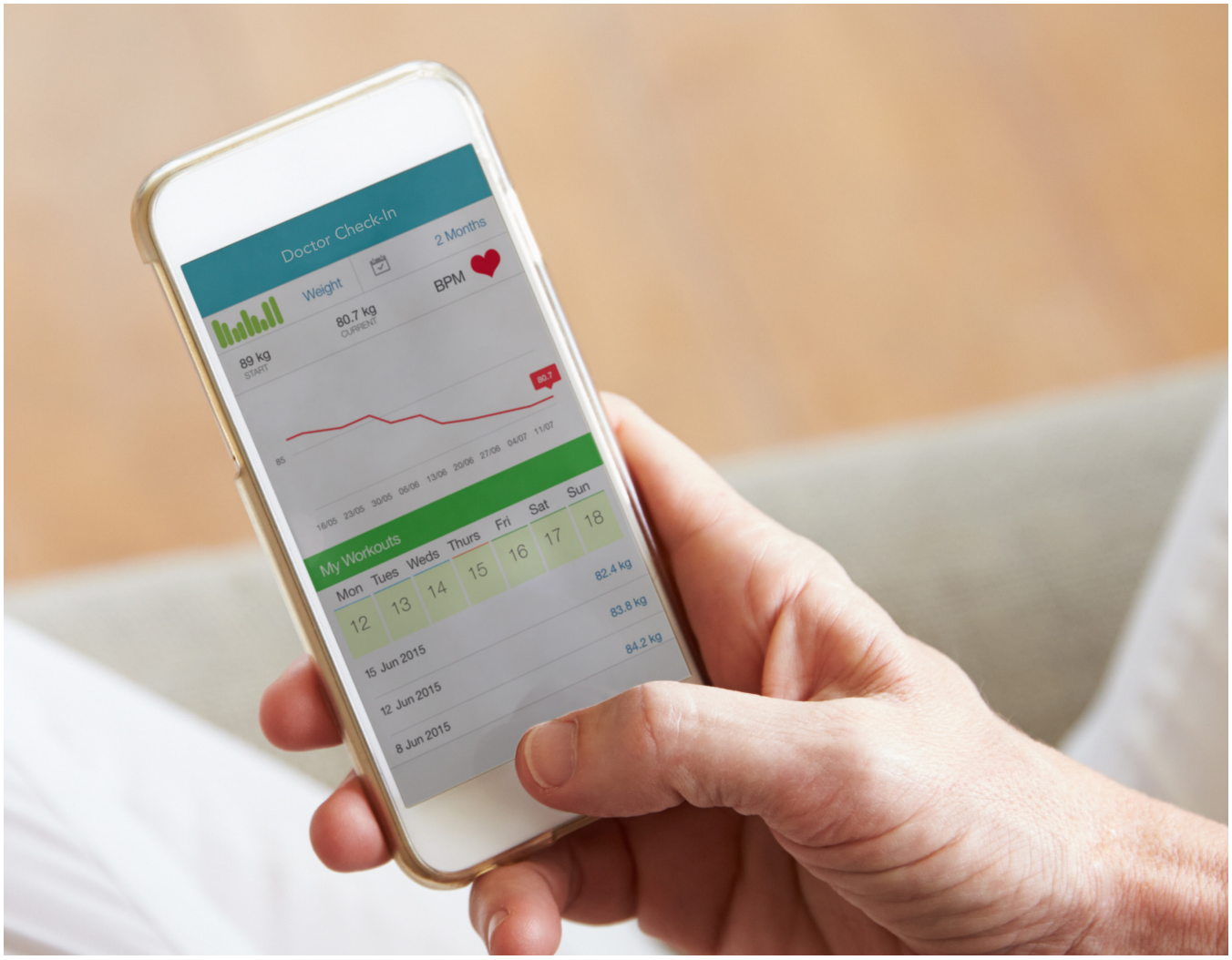
Out-patient monitoring services enable remote monitoring of cardiac monitors (including blood pressure, arrhythmia, and ECG), pacemakers, implantable defibrillators, weight scales, and resynchronization therapy devices among a broad variety of other sensing devices. By utilizing IoT technologies to transform traditional medical devices into "smart" medical devices, healthcare providers and patients can more accurately assess treatment efficacy, detect anomalies or potential issues, and ultimately reduce hospitalizations and improve overall patient health.

The global remote patient monitoring market is accelerating, growing at an estimated ~16% CAGR through 2022[5]

2. OUT-PATIENT MONITORING

IoT-enabled out-patient monitoring solutions leverage sensors with embedded wireless communication – typically facilitated through a cellular gateway – to collect and upload defined physical data to a secure, cloud-based application or platform where intended parties (i.e. users, medical professionals) can access the data, trends, analysis, and other related information to ensure proper medical treatment is administered.

The value that out-patient monitoring solutions deliver for both patients and healthcare providers is considerable, enabling improved patient outcomes and reduced costs for both parties. However, the market for these types of solutions remains highly fragmented which can present challenges for organizations trying to procure, integrate, and manage the various technologies required for a secure, successful implementation.



3. REMOTE WORKFORCE MONITORING

In 2016 alone, criminal and civil charges were brought against more than 300 medical professionals for participating in healthcare insurance fraud schemes totaling approximately $900 million in false billings[8]. In an effort to prevent such fraud, the use of electronic visit verification (EVV) systems will be required for all Medicaid-reimbursed home healthcare providers by January 1, 2019 under the 21st Century Cures Act, resulting in growing adoption of IoT-enabled remote workforce monitoring solutions by healthcare providers.

EVV solutions leverage mobile applications and connected devices to capture home healthcare delivery information including when service begins and ends to validate that patient care has been delivered and insurance claims are accurate. These solutions typically use tablets or smartphones so providers can access GPS capabilities for location verification as well as biometric capabilities (i.e. fingerprint scanning, facial recognition) for identity verification. EVV transaction records deliver auditable records for proof-of-presence as well as billing, scheduling, and tracking.

50% of healthcare IoT adopters are using IoT to establish remote operation and control, and 57% of healthcare providers are confident that IoT has the potential to improve workflow productivity and reduce costs[7].

Powered by IoT technologies, remote workforce monitoring solutions not only enable healthcare organizations to meet regulatory requirements, but also facilitate enhanced operational efficiencies and improved patient experience. **Mobile devices used for EVV can be integrated with other systems and applications so caregivers can remotely access patient-specific information** such as electronic health records (EHR) regardless of their location. This also enables more accurate and expedient record of patient information at point-of-care to reduce missing patient data and contribute to continuity of care, ultimately improving patient outcomes.

Remote workforce monitoring solutions deliver a clear path for home healthcare providers to obtain compliance with the 21st Century Cures Act, but also present an opportunity for other types of healthcare organizations to expand their services to include remote care. With that said, it is critical for organizations to carefully select the appropriate technology mix to ensure optimal functionality, achieve desired business outcomes, and ultimately improve patient care.

Navigating Healthcare IoT Implementations

Successfully implementing any IoT solution – regardless of use case – can be extremely complex, and requires careful planning and strategizing across a broad range of connected technologies. With that said, there are several critical areas specific to healthcare IoT deployments that are key to achieving optimal solution performance and improved patient outcomes:

Interoperability	Security	Scalability
40-60% of IoT value is enabled by interoperability[9]	**Nearly 70% of medical device manufacturers say an attack on their devices is likely[10]**	**60% of organizations stressed that IoT initiatives often prove to be much more difficult than expected[11]**
Interoperability among all connected devices, applications, and systems is critical for achieving accurate, comprehensive patient profiles and the most effective treatment possible.	Healthcare IoT deployments must be secured across all components and potential areas of threat, including the device layer, communications layer, and application layer.	Healthcare organizations implementing IoT must be sure their processes, systems, and underlying technologies are capable of scaling and growing with demand.
• Monitor emerging standards and innovations, such as the Office for the National Coordinator for Health (ONC) interoperability road map that aims to achieve a seamless data system by 2024 • Levarage APIs to structure and consolidate systems • Commit to regula data analysis and performance checks	• Ensure a "security-by-design" approach to IoT vs. implementing security protocols later in the process • Leverage Mobile Device Management (MDM) to protect and manage all connected devices • Implement VPN connectivity solutions and ensure continuous network monitoring for anomalie/risk detection	• Dedicate resources to managing all phases of the IoT solution lifecycle • Utilize a wireless network that is robust enough to handle increased data traffic and provide coverage in all desired geographies • Ensure infrastructure and integration capabilities are in place for collecting, processing, and storing real-time data

Learn More

The rapid growth of IoT technologies can enable healthcare providers to implement transformative, patient-centric treatment options that can significantly improve the quality of care and deliver better outcomes. However, healthcare companies can face numerous challenges as previously described to fully capitalize on the opportunity. It is important to have a clear strategy and plan so you can successfully navigate the complex IoT landscape and returns on IoT investments.

Looking for more information on how to successfully implement healthcare IoT solutions? Reach out to KORE today to learn more about we can simplify the complexity of IoT so you can focus on what matter most to your organization.

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