

SOLUTION BRIEF

Remote Patient Monitoring
Health and Life Sciences



Making Remote Patient Monitoring Simple and Cost-Effective

Collect and analyze patient data remotely to reduce hospital stays, avoid readmissions, and better manage chronic care

Thanks to advances in remote patient monitoring technology, healthcare providers have unprecedented opportunities to improve patient outcomes while reducing costs when managing post-acute and chronic conditions.

Executive Summary

The cost of healthcare services is growing to unsustainable levels. In the United States, national spending for healthcare reached 16.4 percent of GDP.¹ Healthcare costs are also rising on a global level—and the quality of the product offered, as well as access to those services, is extremely variable. To contain costs, providers are being asked to minimize hospital stays and can face severe penalties if patients are readmitted within 30 days for certain conditions. Meanwhile, the growing burden of chronic disease is driving healthcare providers and payers to seek new ways to help patients with chronic illnesses manage their conditions.

To help streamline administration and ultimately enhance patient care, healthcare services are now being delivered through a distributed network. In many cases, distributed care has resulted in lower costs, as well as improved service quality and access. As part of the progression to distributed healthcare service delivery, Intel, working with its ecosystem partners, has helped develop a suite of remote health management solutions that equip clinicians and caregivers with the information they need to provide more effective treatment and get a better perspective on the needs of their patients.

Growing Care Costs Are Creating Increased Financial Pressures

Chronic disease is highly prevalent, accounting for roughly 86 percent of all healthcare spending in the United States (Figure 1).² One in five Medicare patients returns to the hospital within 30 days of discharge, costing the U.S. government an extra USD 17 billion annually.³ In response, the federal government has implemented financial penalties for avoidable readmissions, which is impacting providers with penalties that are threatening their bottom line. If hospitals do not improve, the penalties will increase.

Value-based care incentives are also increasing the burden on hospitals that have relied on a fee-for-service model and are forcing changes in how patients are treated. Home monitoring is a method that can help health systems work more closely with physicians and patients to promote adherence to treatment and early intervention and improve outcomes. It is estimated that 50 percent of all adults have at least one chronic illness and may benefit from a telemedicine intervention.⁴

In the past, adoption of remote health management solutions was slowed by a perception of higher cost and complexity. Newer advanced solutions have helped remove those barriers to deliver more intuitive and innovative remote care solutions that substantially reduce costs compared to traditional delivery models. Removing the complexity of remote care—not just for providers and caregivers, but also for patients—gives them greater freedom and flexibility to participate in their own care.

Chronic disease accounts for **86%** of healthcare costs in the U.S.



One in five Medicare patients returns to the hospital within 30 days of discharge

Chronic disease management accounts for 86% of all healthcare costs

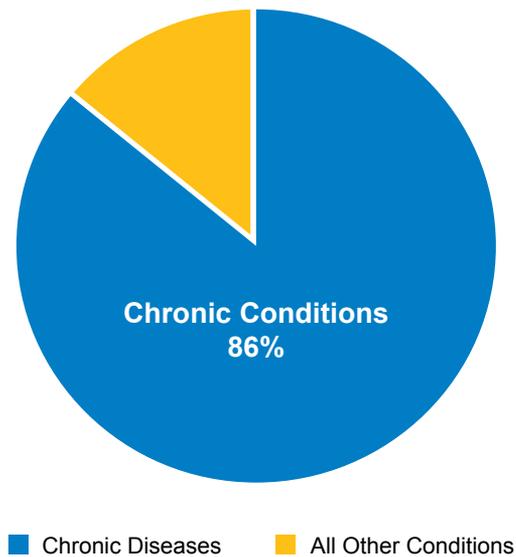


Figure 1. Chronic disease is highly prevalent, accounting for roughly 86 percent of all healthcare spending in the United States

Like applications in many other industries, telemedicine solutions are benefiting from the rise of the Internet of Things (IoT), which brings a multitude of physical objects into the connected world through the Internet. With remote monitoring, the IoT has great potential to improve the health of patients with chronic illnesses and attack a major cause of rising healthcare costs.

Managing Chronic Disease in the 21st Century

Remote health management technologies let patients, caregivers, and providers work together as a team to more effectively manage chronic diseases. Advances in video and audio communications technologies, and wearable and remote sensors, have combined to allow new healthcare delivery platforms to emerge and thrive. This is the centerpiece of the movement toward remote, online healthcare services.

Remote patient monitoring (RPM) enables lower overall cost, secure data collection, convenient in-place monitoring, and increased consistency of care delivery. Outcomes as measured by hospital readmission and unneeded trips to the emergency

room are dramatically reduced. Patient-centered applications include patient portals and personal health records that are designed to educate patients about their disease and medications, and show how they can self-manage chronic conditions such as diabetes, hypertension, and heart disease.

Telehealth applications remotely connect providers and patients for the co-management of chronic diseases. Remote monitoring devices and electronic health records are components that extend traditional telehealth networks to provide enhanced chronic disease management functions for patients and providers. Healthcare businesses can produce better patient outcomes and become more profitable when medical data is used to improve understanding, insights, and outcomes.

Reducing the Cost of Healthcare Delivery

Remote health management technologies are dramatic cost-saving tools. Organizations that use primarily in-person service delivery risk being driven from the competitive marketplace. According to UnitedHealth Group, the largest payer in the United States, a video-based virtual visit offers significant savings when compared to the costs of similar minor medical needs treated at a doctor's office, urgent care facility, or emergency room.

RPM uses in-home Internet connections or cellular connectivity to transmit biometric data to the healthcare organization. Patients are equipped with various peripherals for monitoring and data collection while visualization tools provide medical professionals with access to dashboards or other applications that enable co-management of chronic conditions.

Benefits from remote healthcare solutions include:

- Reduced hospital readmissions and lengths of stay
- Fewer emergency room visits
- Lower cost of chronic disease care
- Improved self-management of health conditions
- Timely, affordable, and convenient access to care wherever and whenever it's needed
- Proactive support when medically necessary
- Enhanced patient quality of life

Building Remote Health Solutions with Intel® Technologies

Building remote healthcare management solutions on standard, open architecture technologies helps healthcare

providers avoid vendor lock-in, ensures greater medical device interoperability, and enables customized applications through the developer ecosystem. Pre-validated platforms speed time to market and allow clinicians to more easily and securely share information. Healthcare organizations and caregivers benefit from:

- Scalable and rugged platforms based on open standards for seamless, cost-efficient technology updates
- Software compatibility with existing designs for investment protection and long life
- Strong ecosystem support for faster and lower-cost product development

Through the use of innovative technologies and open platforms, Intel and its ecosystem partners offer a wide range of remote healthcare solutions (Figure 2).

Collect: The Sensors

Wearable sensors include activity monitors and clinical wearable devices, which provide biometric and fitness data that can be communicated directly to a service gateway for integration with the patient record, or to a big data platform running in the cloud for use in advanced analytics.

Transmit and Aggregate: The Gateway

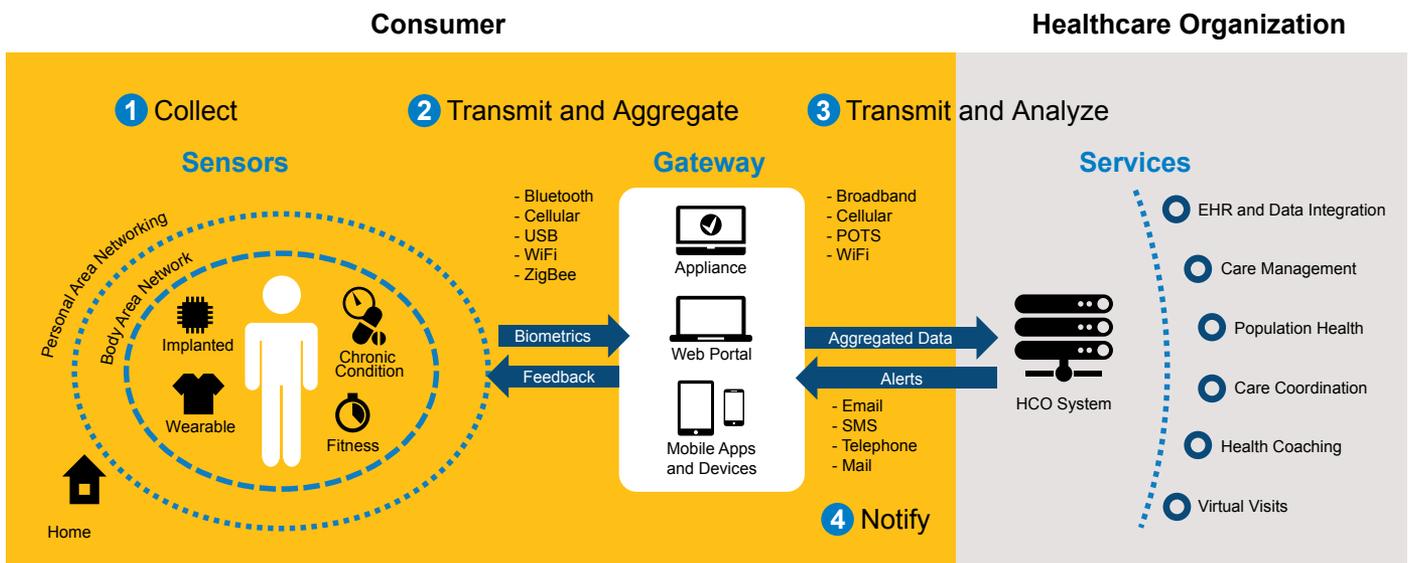
The edge gateway/tablet/PC/phone enables multiple medical devices to communicate back to the healthcare organization—either in a data center or the cloud. Application software running on the edge gateway sends the data to the healthcare organization. The gateway provides a number of additional features, such as encryption of data from peripherals, update controls, secure device pairing, location management, 3G management, whitelisting, secured communications, enforcement of application signing, encrypted entries, and cloud connectivity.

Transmit and Analyze: Big Data

Complex data is transmitted to an advanced analytics engine often running as a cloud service. This provides additional insight into the data and can lead to meaningful interaction with the patient and the care provider network to improve outcomes. Predictive analytics might anticipate outcomes and lead to proactive care delivery rather than simply reactive care.

Notify: Visualization

Visualization tools such as dashboards, portals, and mobile applications built at the top of the solution stack make the data actionable.



Source: IDC Health Insights, 2013

Figure 2. Remote management technologies provide for a new, rich pool of data that provides a continuous stream of patient data, which allows for new innovative services and intervention opportunities

Summary

Remote management technologies provide for a new, rich pool of patient data that can be continuously streamed, allowing for innovative services and intervention opportunities. Healthcare organizations are increasingly collecting patient-generated data from wearable devices or general fitness trackers, much of which is unstructured. Intel's remote health management solutions enable the integration of this data with the patient health record and facilitate the analysis of these new data streams.

The exploding cost of traditional in-office care is encouraging new and creative ways to provide more efficient and effective treatment of chronic disease to aging populations. The change in service delivery is happening now and new remote management technologies are poised to play a major role in this healthcare transformation.

For More Information

Find the solution that's right for your organization. Contact your Intel representative, register at Intel **IT Center**, or visit intel.com/healthcare



¹Centers for Medicare & Medicaid Services, National Health Expenditure Accounts, "NHE Tables" (accessed April 3, 2015), <http://go.usa.gov/jmGY>

²AHRQ Publications, Rockville, MD: Agency for Healthcare Research and Quality; 2014.

³Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. *N Engl J Med* 2009; 360:1418.

⁴Wu SY, Green A. Projection of chronic illness prevalence and cost inflation. Santa Monica, CA: RAND Health; 2000.

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