Remote Patient Monitoring Gateways

Key considerations for choosing the best option for your remote patient monitoring programs

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Until recently, home patient monitoring meant entrusting patients with the tedious task of measuring and recording their weight, blood pressure, blood sugar levels and other measures vital to assessing their condition – and progression. For the most part, resulting data was sporadic – if it was collected at all. Indeed, compliance was discouragingly low, which gave practitioners precious little insight into what transpired between patient visits.

Results from deployment after deployment underscore the potential for remote patient monitoring to drive dramatic improvement in care. It provides frequent, even continuous results, affording healthcare providers and other caregivers opportunities along the way to coax compliance, detect early signs of complications and make course corrections long before the next scheduled appointment. All of which keeps people healthier, and lowers the incidence of readmission. That helps save lives – and money.

Remote patient monitoring has been growing rapidly. In 2016, according to one estimate, it expanded its footprint 44 percent globally, to 7.1 million patients. And as the population ages, our already overburdened healthcare system is being further stressed, hastening the need for change. At the same time, the shift to a fee-for-results compensation model is helping to pick up the pace of transformation.

In November 2017, for example, the Centers for Medicare & Medicaid Services (CMS) – by far the nation's largest insurer – added new codes for remote patient monitoring as well as new incentives for healthcare providers to adopt patient-generated data into their care programs. Private-sector payers are moving in the same direction, as well.

For decision-makers at healthcare systems and remote monitoring platform providers who are assembling kits for post-acute care patients, those with chronic conditions and other at-risk members of their populations, measurement options abound, including connected scales, blood pressure cuffs, pulse oximeters, heartrate monitors and glucometers.

The real challenge is building a platform sophisticated and flexible enough to handle the requirements of myriad combinations of conditions – and yet simple and compelling enough to keep patients interested, engaged and compliant. At a high level, they have four classes of gateway options:

- software applications installed on BYO smartphones and tablets,
- dedicated hubs specially designed to collect data from connected sensors,
- specially configured tablets and
- an emerging class of hybrid platforms that marry the affordability of hubs with the tablet's flexibility for providers to incorporate their own services.

Each of the alternatives carries its own set of advantages and disadvantages. But it is worth noting that, of the four options, only dedicated hubs are not able to offer providers the ability to deliver additional services through their own apps. To do that, they must also add smartphones, tablets or apps to their kits, which adds to the cost and complexity of the platforms.

This market brief is designed to help decision-makers decide which remote patient monitoring gateway option makes the most sense for them. The perspective is the result of extensive analysis, including interviews with numerous industry players, from hardware suppliers to platform and healthcare providers.

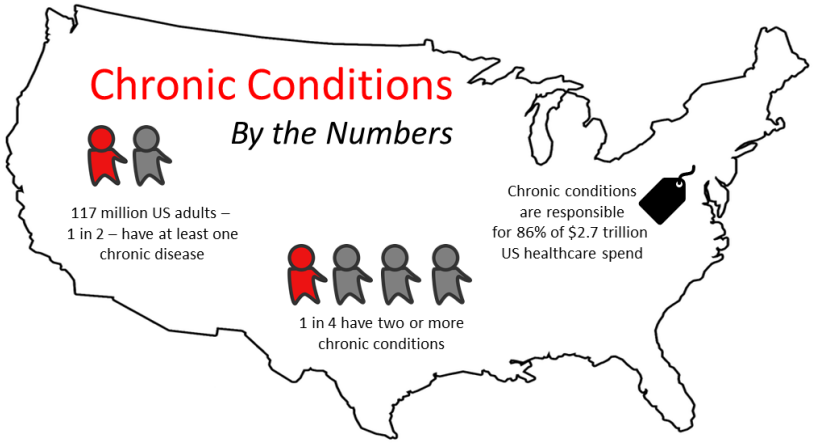
Market Forces

For many healthcare providers, it's not about whether to put together remote patient monitoring platforms, but when. With growing availability and reliability of connected devices, along with the transformation to fee-for-quality from fee-for-service compensation, healthcare providers have more motivation than ever to explore remote patient monitoring and telehealth.

As mentioned, the market for remote patient monitoring topped 7 million patients in 2016 – though the hub-based kits are currently a small percentage of that.

Today, the primary focus for hub-based monitoring kits are high-risk patients after they are discharged from the hospital, a population that tops out at about 3 million patients per year. Many of the hubs and sensors in the kits are returned after use, sanitized and reissued an estimated 12 times during their life cycle.

As costs come down, and healthcare systems grow more accustomed to integrating remote sensor data – as well as insight from that data – the potential population that could ultimately benefit from remote patient monitoring grows exponentially. For example, management of chronic conditions – like asthma, diabetes and hypertension – clearly benefit from remote monitoring. And as much as half of the US population has at least one chronic condition.



Source: Centers for Disease Control and Prevention

For those exploring remote monitoring platforms for acute-care discharges and other high-risk patients, there are basically four gateway options to consider: software-only, dedicated hardware hubs, purpose-built tablets and application platforms. There are costs and benefits to each option, as readers will see in coming sections.

Software-only Options

At first blush, software loaded onto BYOD smartphones and tablets seems like a very compelling option to patients, care givers and practitioners. It is the least expensive option, because there is no hardware to buy and maintain. Which means there are no associated inventory management headaches. And tech-savvy patients typically prefer using their own devices over hospital-issued hardware. Examples of software hubs include Welch Allyn's Home app and Nokia Health Mate.

But while software options are built with security in mind, it is more difficult to protect patient data on BYOD hardware than on purpose-built devices. It is more difficult to control the environment in other ways as well. Indeed, the unpredictable mix of applications and peripheral devices can result in significantly higher support costs than for dedicated hardware.

Dedicated Hubs

Dedicated hubs are cost-effective hardware options, designed specifically to handle the task of remote patient monitoring data collection and transmission. As a result, they are more secure than software-only, BYOD options. And because they are locked down, support costs are much lower as well.

The downside is they are far more limited in scope than the other alternatives, as gateways can do little else besides provide connectivity for the sensors included in a patient's kit. A good example of a dedicated hub is Qualcomm Life's 2net hub.

Some dedicated hubs, like the HealthGo+ from eDevice, include connectivity for some sensors, like pulse oximeters and blood pressure cuffs. As well, they feature built-in touch screens, which can guide at-home patients with a visual menu of options.

Dedicated hubs are not equipped to incorporate additional services, like onboarding, remote checkups or tutorials. To accommodate such services in the care plan, providers must add purpose-built or configured tablets, smartphones and other devices to the kit, which can wipe out any cost advantages.

Specially-Configured Tablets

Platform providers like Philips and Vivify typically opt for commercially available tablets as their hubs because they offer all the flexibility, processing power and display real estate they need – and then some. The tablets can be locked down, so they do not face many of the same security risks and support headaches as software on BYOD devices.

The downside of deploying tablets as remote monitoring hubs is the same as their primary benefit: they offer more capability than what's needed for even the richest remote patient monitoring platform. As a result, tablets cost more to implement than the other options.

Application Hubs

A new segment is now emerging that combines the cost and security advantages of dedicated hubs with the flexibility to add service components that tablets afford. The first environment to appear with this level of capability is the new Intel Health Application Platform, which Flex is now making available on its IoT Compute Engine. Care providers say it is a compelling option because they can layer their own services onto the locked-down platform via Android apps – but at a much lower cost than a full-fledged Android or iOS tablet.

The Flex IoT Compute Engine currently does not offer video support, which means that providers who want to incorporate applications like telehealth, conferencing and video tutorials will still need to build their kit around specially configured tablets. Intel says that Intel Health Application Platform hardware with full-fledged tablet replacement capabilities will be available in late 2018.

Other Considerations

In addition to initial hardware and support costs, implementers should consider upfront design costs, as well as the various monthly service fees, for connectivity, security and support. Those fees typically end up in the $15/month range.

Some healthcare systems and remote patient monitoring platform providers say they prefer to have all the data end up in their own repositories, as opposed to a third-party cloud solution. This is more of a privacy and data ownership consideration than a monthly cost of operation issue. In particular, some point to Qualcomm Life's cloud repository. For its part, Qualcomm Life says it is holding onto the data it collects because it believes it will provide valuable patient insights at some point in the future.

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As our population ages, implementing remote patient monitoring programs is becoming a national imperative, to save lives as well as to keep our healthcare system afloat. And with new equipment options – and new CPT codes to pay for those options – remote patient monitoring is becoming an imperative at the healthcare provider level, as well.

Of course, putting a winning program together is more complicated than selecting the right connected devices to help monitor your at-risk patient population. Implementers need to understand that choosing the right hub to collect and transmit data reliably and securely is critical to success, both financially as well as for patient compliance and, ultimately, health.

Until recently, dedicated hubs have offered the best mix of affordability, customization, security and reliability on the market. But as the market grows and providers develop more service options, some providers say that dedicated hubs have become too restrictive for their needs. Those providers increasingly have been turning to provisioned tablets as the centerpiece for their home care packages, though the cost has caused others to pause.

The new breed of application hubs like the Intel Health Application Platform is opening new possibilities for providers with a unique mix of the best attributes of dedicated hubs and tablets. And next-generation application hubs will provide the full complement of tablet capabilities in a more affordable form factor that is easier to set up and lock down.

In addition to hardware costs and monthly fees, implementers also need to consider the intangible costs of the various hub platforms, such as the privacy and security of the data in the long term as well as the short term.

	Software/BYOD	Dedicated Hubs	Provisioned (tablets, phones)	Application Hubs
Initial Cost	Lowest	Lower	High	Low
Support Cost	High	Lowest	Low	Lower
Flexibility	High	Low	Higher	High

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