# HEALTHCARE **DIVE**

**DEEP DIVE**

# How is IoT changing healthcare?

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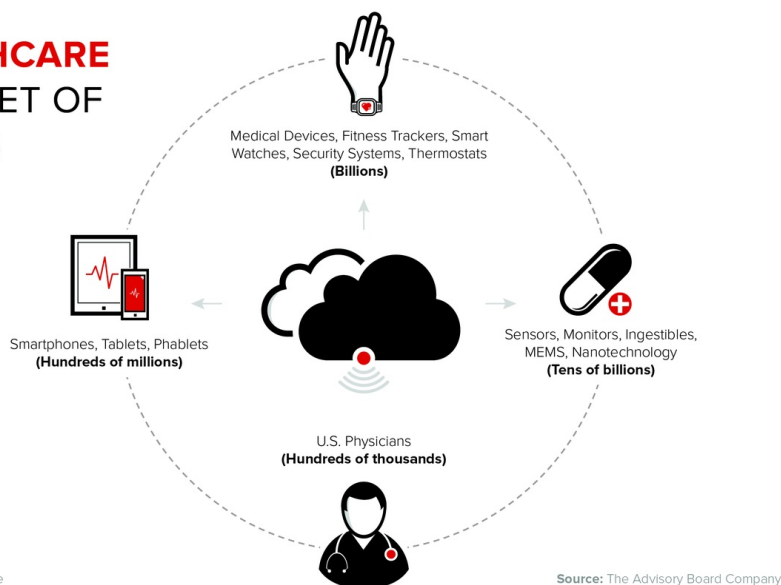
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Although connectivity among medical devices is not new, the Internet of Things (IoT), or the Internet of Medical Things if you will, is gaining traction as the healthcare industry has been increasing efforts to improve quality and the continuum of care.

## What is IoT?

A report from The Advisory Board Company's Health Care IT Advisor defines the Internet of Things (IoT) as "the connectivity and interoperability of increasingly smart objects, such as appliances, sensors, controllers, wearables, and medical devices."

MarketResearch.com estimated in 2015 the healthcare IoT market segment would hit $117 billion by 2020. Consulting firms, researchers, technology companies, among others, believe IoT platforms, composed of Internet-connected devices, will substantially develop over the next few years.

**HEALTHCARE**
INTERNET OF
THINGS

Medical Devices, Fitness Trackers, Smart
Watches, Security Systems, Thermostats
**(Billions)**

Smartphones, Tablets, Phablets
**(Hundreds of millions)**

Sensors, Monitors, Ingestibles,
MEMS, Nanotechnology
**(Tens of billions)**

U.S. Physicians
**(Hundreds of thousands)**

**Credit:** Healthcare Dive                                        **Source:** The Advisory Board Company

North America dominated the global healthcare IoT market in 2014 with about $24.6 billion in revenue and is expected to continue its dominance at least until 2020, a P&S Market Research report shows.

Individuals can play a more active role in their care with IoT wearables that capture and track their health data. Also, IoT has the potential of having a profound impact in healthcare areas such as remote patient monitoring, medication adherence, and intelligent hospital rooms. For example, Philips Lifeline offers a medication dispensing device that functions as an IoT product. It automates patients' pill-taking process by sending reminders and dispensing medication at a pre-scheduled time.

Patient health data, such as electrocardiograms and blood glucose levels, can already come from a number of connected devices as the ability to keep tabs on this type of information is vital for some. Smart devices can reduce the need for face-to-face follow-ups with physicians, which in turn could lower costs as well as enable patients to comply with instructions.

## How one company is using IoT to help the physician/patient relationship

Biotricity, a developer of medical remote monitoring solutions, offers physicians a health IT solution called bioflux, composed of an electrocardiogram (ECG) monitor, software, and a monitoring lab, that targets cardiovascular disease through diagnostic and post-diagnostic care processes. The ECG device is put on the patient and constantly tracks data. Anytime the product detects arrhythmia, it transmits the ECG data from a minute before and a minute after detection to a monitoring center.

When an event occurs, a note pops up on a screen at a monitoring center saying something along the lines of "Device detecting some arrhythmia." While the instructions are defined by the physician, the physician and monitoring center have access to the transmitted data, but the patient does not. ECG technicians at the call center will read it along with a note from the patient's physician saying, 'If tachycardia occurs, please call me' or 'Please call the patient.'

"We're looking at a technique focused on arrhythmia detection so once you have an arrhythmia, the doctor will tell you how to manage this condition," Biotricity CEO and founder Waqaas Al-Siddiq told Healthcare Dive. Al-Siddiq states having a complete IoT platform is crucial to monitoring for longer term care while minimizing risks, especially chronic illnesses, because as long as Internet service is available, up-to date health data can be quickly transmitted to a professional.

## As always, challenges abound. Will regulations follow?

In its report, the Advisory Board Company states IoT implementation challenges in a healthcare setting include:

- Interoperability;

- Regulation;

- Privacy protection;

- Dealing with data overload;

- Complexity; and

- Security.

Research shows physicians already face a great deal of burden, which has been primarily attributed to administrative tasks. If an IoT platform is designed in such a way that physicians are overloaded, too much data would distract them from their mission of treating patients, Al-Siddiq says.

However, if devices and IT platforms are not compliant from a development or regulatory standpoint, potential dangers with regards to patient and privacy safety become vastly greater.

According to Al-Siddiq, regulatory integration is going to start creeping up on IoT. ABC's Ken Kleinberg echoes this statement.

Kleinberg told Healthcare Dive some technologies are so powerful and dangerous that they will have to be regulated. "But the current trend is for government to do less regulation, not more, when it comes to IT, to not be accused of stifling innovation and holding back the economy," he says.

## Security concerns will rise alongside the Internet's evolution

Al-Siddiq envisions the industry will begin seeing healthcare wearables 2.0 or 3.0 as patient monitoring technology becomes faster and better. They will become smaller, and could even be integrated into shirts or tattoos. More than 70 million health

devices will have been adopted across the world within the next few years as new ones receive FDA approval, according to a recent study conducted by Juniper Research. Juniper Research also concluded that although interoperability with personal smartphones will become more valuable to patients, the number of individuals being monitored by devices will increase fourfold by 2020.

However, concerns remain with healthcare wearables' vulnerability to hackers.

Each connectivity point among different healthcare technologies on an IoT platform is an opportunity for hackers to assume control over and expose private and personal information.

"It was hard to believe a few decades ago that the Internet would ever be – that so many companies, people, ideas, and competing interests and technologies could ever come together enough to exist on one useful network – one that has changed the world perhaps more than any other human advance since the printing press," Kleinberg says.

While it may be an increasingly common topic of conversation, according to Kleinberg, IoT is still a relatively new concept so it's too early "to see how the proliferation of so many devices, operating systems, sensors, standards, and competing interests will all work together." However, he adds that having device connectivity across the world would be a step towards the evolution of the Internet.
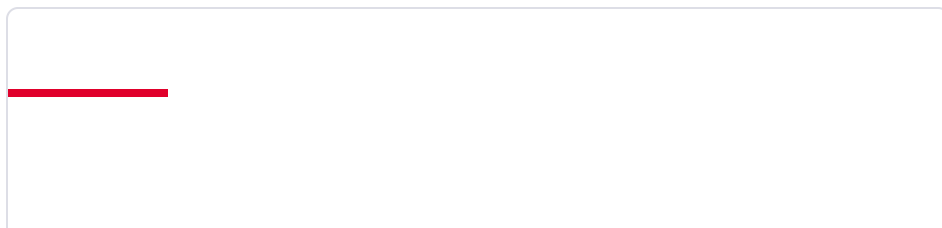
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