As part of the Health Care Trends series, in this course you will learn about trends on connected health, remote patient monitoring, devices, and telehealth. The course also posits projected impacts of these trends.

Questions or comments? Contact us here.

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Introduction

Learning Objectives

After completing this course, you will be able to:

1. Understand the status of connected health and remote patient monitoring, physician and patient attitudes toward these efforts, and new technologies on the horizon.

2. Recognize the current scope of telehealth and identify its possible impacts on care delivery, cost, patient satisfaction, and barriers to widespread adoption.

3. Explain predicted impacts of health information technology trends for patients, physicians and payers.
Introduction to Connected Health

Connected health broadly refers to a model of health care delivery in which technology, data and data sharing, and remote communication are leveraged to improve the quality and efficiency of patient care.

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According to a report by Accenture, investments in digital health companies spiked earlier than anticipated in 2015, to $7.0 billion annually. This figure declined slightly in 2016 to $6.4 billion.
billion. Accenture estimates that the market would reach $7.0 billion in annual start-up funding in 2017.

Simultaneously, according to CDW’s 2017 Patient Perspectives Study, patients are becoming more and more comfortable communicating via new technologies:

- **98%** feel comfortable communicating with health care providers through online portals
- **83%** feel comfortable communicating through mobile apps
- **77%** are comfortable sending and receiving text messages from providers
- **75%** are comfortable with online chat
- **69%** are comfortable with video chat


The survey of 1,501 people in the United States defined virtual health as technology-enabled health care services that are provided independent of time and location.

The survey asked participants which of 16 services they would be interested in receiving virtually. At least 50% of respondents answered affirmatively for each of the 16 services, and for 8 of the 16 services, more than 70% of respondents answered that they were interested. These services included:

- Tracking their health status (77%)
- Follow-up appointments (76%)
- In-home follow up care after hospitalization (74%)
- Self-care reminders (74%)
- Discuss specific health care concern with provider (73%)
- Receive daily support for chronic care management (72%)
- Receive reminders to take medication (72%)
- Receive an exam for non-urgent condition (70%)
Those who have tried virtual health services reported doing so because it was more convenient, because they were comfortable using technology in other aspects of their life and wanted to do the same with health care, and because they were curious about the prospect of receiving care virtually.

Among those who were less interested in virtual health, the survey found that encouragement by physicians would act as an important driver for virtual health utilization.


Best Uses

What are the primary benefits and strategies of patient engagement technology tools?

Members of the New England Journal of Medicine (NEJM) Insights Council identified supporting patient efforts to be healthy (67%), providing information to providers on how patients are doing when not in clinic (60%), and creating an ecosystem that allows for better predictive analytics around patient health and timely intervention (51%) as the primary benefits of using technology for patient engagement.

Among the tools themselves, Council members identified biometric measurement devices (85%), apps (75%), texting (70%) and wearables (68%) as the most effective patient engagement technologies.

Barriers

While patient trust in communicating with physicians through technology is growing, and physicians acknowledge the potential benefits, significant barriers exist to widespread recommendation by physicians.

Providers don’t know what to recommend (67%)
Unclear impact on quality outcomes (42%)
No process in place for providers to recommend tools (37%)
Lack of integration with EHRs (34%)


Predicted Impacts

AMA_Trends 2018-19 Health IT MM2 Connected Health.pdf
188.6 KB
Remote patient monitoring (RPM) refers to the use of technology to monitor patients outside of traditional clinical settings. Smartphones and the widespread availability of the Internet and cellular networks allow monitoring to take place at almost any location.

Digital sensors can collect a variety of data, including physiologic, nutritional, fall and medication administration data. Devices for collecting these data include scales, blood
pressure cuffs, pulse oximeters, glucometers, fall sensors, and drug dispensing devices. These devices support monitoring and care 24 hours a day, in nearly any location, and can be especially useful to monitor patients with chronic conditions.


Payment Rules and Codes

Beginning in 2018, the Centers for Medicare and Medicaid Services (CMS) will pay providers who leverage RPM tools and make use of the data they generate for care management and coordination.

Additionally, the AMA published three new CPT codes that will be available beginning in January 2019 and that cover aspects of RPM including equipment set-up and patient education on use, device supply with daily recordings or the transmission of programmed alerts, and remote physiologic monitoring treatment management services.


Remote Monitoring and Telehealth on Patients with Heart Failure

A review of 19 studies of the effects of RPM on the health outcomes of patients with heart failure found that telehealth and home telemedicine appeared to be largely effective in reducing heart failure rehospitalization and mortality.

The study reviewed RPM interventions including telemonitoring, home telehealth, videoconferencing and mobile phone-based monitoring.

The results concluded that telemonitoring, including blood pressure, heart rate, weight, and electrocardiogram (ECG) must form an integral part of the routine care of patients with heart failure, and contribute to reduced mortality and hospitalization, as well as improved quality of life.

The study also suggested that home telehealth interventions, classified as remote health care monitoring or delivery between a health care provider and patient outside of a clinical setting, contribute to reduced health care utilization and improved quality of life. However, the study noted that number and quality of studies related to home telehealth interventions on heart
failure were limited, and that these interventions were not shown to improve knowledge and/or self-care.

Additionally, the study did not find conclusive evidence to support the effectiveness of video monitoring and mobile phone–based monitoring, possibly due to a limited number of studies examining the effects of these interventions on patients with heart failure.


FDA Digital Health Innovation Action Plan

In June 2017, the Food and Drug Administration (FDA) announced the Digital Health Innovation Action Plan, which included plans for a precertification program aimed at replacing the need for premarket submission for certain products. Under the plan, the FDA’s Center for Devices and Radiological Health (CDRH) could pre-certify developers who demonstrate a culture of quality and organizational excellence based on objective criteria, who could then qualify to market lower–risk devices either without or with a more streamlined premarket review. This Software Precertification ("Pre–Cert") Pilot Program began in late 2017, and in April 2018, the FDA published a working model of the program for public feedback.


Wearable Devices for Monitoring Respiratory Function

Wearable devices refer to those that can be worn on the body without restricting mobility or daily activities; wearable biomedical sensors are a subset of those devices that have the ability to measure physiological parameters.

These wearable biomedical sensors offer the promise of monitoring a patient’s physiological or biochemical status continuously, rather than the snapshot offered by traditional diagnostic tools.

While roadblocks exist, including regulation, data ownership and security, and accuracy and reliability, wearable devices have shown the ability to aid the assessment and monitoring of respiratory function and provide information about the environment that may affect the respiratory system.

*Instructions: Click each tab to learn more*
Pulse oximetry refers to the **measurement of oxygen saturation** through the illumination of a small portion of human skin and **measuring light absorption**, which depends on the levels of oxygenated and deoxygenated blood. Recent advances in wearable pulse oximeters have led to significant **improvements in accuracy and reliability** of such devices, which can be worn in various places on the body including the wrist, head, earlobe or legs.

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<th>PULSE OXIMETRY</th>
<th>PULMONARY VENTILATION</th>
<th>WEARABLE DEVICES</th>
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Pulmonary ventilation is the product of **respiratory rate and the volume of air inhaled and exhaled** with each breath.

Ventilation assessment often still requires use of a flowmeter embedded in a mouthpiece, mask or tube, which while effective in clinical settings, are **not useful for respiratory monitoring after discharge**, during daily activities or sleep.

Recently, start-up companies have begun to develop wearables aimed at measuring ventilation by other means. Such methods include **body surface sensors** that measure rib cage or abdominal motion; **calibration methods** that estimate volume changes via physical measurement; and **accelerometers** worn on the torso and derive breathing rate by measurement of the chest wall. Each of these methods have limitations, but are capable of providing valuable information under certain circumstance.
Wearable devices and mobile phones allow for the measurement of air quality and other environmental data, including atmospheric pressure, temperature, humidity, ambient light and ultraviolet exposure. This information could be used by wearers, particularly those with sensitivities to particular environmental factors, to seek locations with less potential threats or irritants.


Predicted Impacts

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Introduction to Telehealth

While no universally agreed-upon definition of telehealth, (or telemedicine) exists, the literal meaning of the term is “healing at a distance.” Generally, the terms refer to the use of telecommunication technologies and electronic information to allow for the remote delivery of health care.
Some sources differentiate between telehealth and telemedicine, but in this module, the terms will be used interchangeably.


**Spending and Growth**

In February 2018, Congress passed the Creating High-Quality Results and Outcomes Necessary to Improve Chronic (CHRONIC) Care Act, which allowed for broader use of telehealth services:

- Medicare Advantage plans may now include additional telehealth services in bids
- Some ACOs were granted added flexibility to provide telehealth services
- Beneficiaries receiving home dialysis treatments can now perform monthly check-ins with their doctor via telehealth rather than in-office
- Availability of telehealth was expanded for individuals who may be having a stroke to ensure that they receive the correct diagnosis and treatment

CMS payment of telehealth claims grew 28% from 2015 to 2016, reaching $28,748,210. Over the same period, the number of claims rose by 33%, showing a continued trend of growth.


Stats

Instructions: Flip each card to learn more about telehealth statistics

The potential market for non-emergency telehealth visits in the United States is over how many million?

400 million, and about 1/3 of annual ambulatory
What percentage of large employers expect to make telehealth services available in states where it is allowed in 2018?

96%

Telehealth usage by providers grew from 54% in 2014 to what percentage in 2017?

71%

Between what percentage range of 3,000 surveyed patients in 2016 reported being “very satisfied” with telehealth services?

94% and 99%
Kaiser Permanente

The CEO of Kaiser Permanente, Bernard J. Tyson, announced in 2016 that during the previous year, over half of the approximately 110 million patients the health organization saw connected through online portals, virtual visits or Kaiser’s apps, overtaking in-person visits.

Speaking at the 2016 Salesforce.com Dreamforce conference, Tyson said:

“We are going through a major transformation in healthcare. Because we were all-knowing, we built the entire healthcare industry where everyone has to come to us, but now we are reversing the theory where people have to come to us for
Impacts on Health Care Costs

A study by the RAND Corporation in March 2017 found that telehealth may increase cost of care. While telehealth appointments ($79) on average are cheaper than office ($146) and emergency room (ER) visits ($1,734), the convenience and low cost of telehealth services may encourage patients to consult physicians for conditions they otherwise may not have, such as the common cold.

The report suggested that increasing patient cost-sharing could discourage overutilization. Conversely, the report suggested that health plans encourage patients who frequently use the ER for chronic, low-acuity conditions to use telehealth services instead, as it would lead to a decrease in spending.


Barriers

Most frequently cited barriers to telehealth adoption, according to a survey of chief information officers, IT Directors, telehealth managers, and others conducted by the College
of Healthcare Information Management Executives and KLAS:

**Instructions:** Flip each card to learn more about barriers

- **Payment (59%)**
- **Patient and provider awareness/education (25%)**
In addition, interfaces that allow health care providers to access EMR information within telehealth platforms are limited, and the cost of achieving that type of integration is high; seven in ten of those surveyed said they did not have such integration in their systems, and only 14% had access to bidirectional integration, i.e. information could flow in all directions.


Utilization and Coverage, Government

A report by the Government Accountability Office (GAO) found that Medicare and the U.S. Department of Defense (DoD) lagged behind the Veterans Affairs (VA) system in utilization of telehealth and RPM.
The same report found that less than one in every **100** Medicare patients received remote care, compared to more than one in ten (12%) of VA patients.

At the time of the study, only patients in underserved rural areas were covered for any telehealth services, and those patients were required to access those services at specified locations (e.g. a doctor’s office or hospital). Additionally, Medicare covered only **81 telehealth services**. The VA, in contrast, does not specify locations from which telehealth can be used or limit the types of services provided; **55%** of the 702,000 veterans who utilized telehealth services in 2016 were located in metropolitan areas.


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**Telemental Health**

**Health Affairs Study**

The use of telemedicine for mental health care, or telemental health, has demonstrated a long trend of **rapid growth**. According to a Health Affairs study published in 2017, the number of telemental health visits among rural Medicare beneficiaries grew at average **annual rate of 45.1%**. In 2014, there were 5.3 telemental health visits per 100 rural beneficiaries with any mental illness, and 11.8 visits per 100 rural beneficiaries with serious mental illness.

The study also revealed large discrepancies between states. **Nine states** in 2014 had more than **25 visits** per 100 rural Medicare beneficiaries with serious mental illness, while **four states** and Washington D.C. had **zero**. States with more favorable regulatory policies had roughly twice the rates of telemental health use compared to states with less favorable policies, and states with telemedicine parity laws had a **20% higher rate of usage**.
The study also noted that **since mental health conditions often do not require a physical exam**, they may be particularly **well suited to telemedicine**. Numerous randomized trials have shown the use of telemental health to assess and treat patients with mental illness to be as or even **more effective than in-person care**, particularly among patients with **depression and schizophrenia**.


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**JAMA Internal Medicine**

A study published in **JAMA Internal Medicine** in May 2017 found that the Los Angeles County Department of Health Services safety net clinics **eliminated** the need for more than **14,000 visits** to specialty care professionals by implementing a **primary care-based teleretinal diabetes retinopathy (DR) screening**. Additionally, annual DR screening rates increased among the 21,222 patients by **16.3%** (from 5,942 to 14,633) and **wait times** for screening **fell 89.2%**, from a **median of 158 days to 17 days**. The study concluded that in the safety net, where the need to so is most critical, teleretinal DR screening programs have the potential to maximize **access and efficiency**.


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**Predicted Impacts**
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Lesson 6 of 6

Additional Resources

Transcript

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Connected Health_Transcript.pdf
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