The Current Status of the Telehealth Industry

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Abstract

Discovering the real value of telehealth is recognizing the immeasurable possibilities that are available within the healthcare industry and the expectations for future generations. Health plan members are essentially customers who have the ability to compare services from various healthcare providers. Finding a healthcare provider that closely matches the requirements of the health plan member will become the new norm; therefore health plan members will no longer be willing to accept a medical provider that utilizes the traditional approach. In turn, healthcare providers will be able to bill for services rendered during consultations, which will be delivered in unconventional methods. In addition, government regulations require healthcare providers to obtain licenses and certifications, which uphold industry standards and ensure quality healthcare; however these regulations stifle the market and will restrict the deployment of telehealth solutions. Ultimately, the healthcare market needs to adopt new methods and dictate the path driven by the technological breakthroughs; as these advancements will improve the level of service.

1. Introduction

The need to provide medical professionals with long-term statistical health plan member data has become apparent in the evolution to offer higher quality medical care. In some instances, the patient, or health plan member, may feel uncomfortable, feel-increased stress, and develop a higher level of anxiety upon facing a doctor or healthcare representative. Many times, an increase in blood pressure can occur during a stressful workday thus causing a negative impact in their blood pressure test results. This is commonly described as the “White Coat Syndrome”, or “White Coat Hypertension” [1]. The effects of WCS/WCH are thought to be temporary, as an individual’s blood pressure may alter during the doctor’s visit due to the increase in stress. When the individual leaves the doctor’s office they will most likely return to normal levels. It is apparent that many people experience similar effects when participating in a community blood drive. Typically, blood drives are held at local community centers, such as a church or as a company event. Similar to the blood sugar example, an individual may be stressed after a long day of work, resulting in an increase in blood pressure. One may also assume that the increase in stress and high blood pressure is caused by impending arrival of test results. These results will then be transferred to the individual’s permanent record and may conflict with his or her normal readings. Due to the poor test results, this person may not be able to participate in a lifesaving community event. In essence, this document will discuss how telehealth can overcome these obstacles. With the use of telehealth and other advancements in healthcare, the medical industry will be able to surpass these challenges. Through the production of well-care monitoring devices and software applications, health plan members and healthcare providers will be able to evaluate medical data on a consistent basis, thus allowing for more accurate readings.

2. Identify Current and Past Attempts to Unify Health Data

A major element within the healthcare industry is medical records. As more healthcare providers phase out of paper based systems, they begin to adopt more advanced methods. Unlike today’s software, the legacy systems had many downfalls. Paper based systems are known to be time-consuming, costly and inconvenient when retrieving and storing copies of the healthcare member’s medical records. Modern technology has altered methods of communication, for instance the use of computers, the Internet, tablets and other devices, are revolutionizing how individuals communicate with one another. As a result, the methods of communicating and exchanging medical records are also altering. Ultimately, these advancements are enriching the lives of many by enabling more effective healthcare management. These technologies have great potential to help address contemporary global unification of digital health data. Ultimately, it is allowing healthcare
members to access health data in a more practical and convenient setting.

Many healthcare professionals would suggest that shared access to healthcare records, between a health plan member and the healthcare provider, would result in more effective care. One of the pioneering efforts in digital health data is the creation of electronic health records, or EHR [2]. These systems have been in use since the 1960’s, as it began with the physicians’ goal to find a convenient method to store and access health data. EHR systems are helpful as they contain collections of electronic health information about a health plan member or even a population. Most importantly, these digital records can be shared with a wide spectrum of health providers such as general medical departments, consumers, specialized clinics, laboratories, nutritionists, health clubs and also health insurance companies. EHR software can store an immense amount of health plan member information and can rapidly provide critical health plan member information to users.

During the 1960’s several EHR software systems were introduced. Some of these systems included Help Evaluation through Logical Programming (HELP), which was a system support database and storage [3]. HELP was first utilized in 1967 at the Latter Day Saints Hospital located in Utah. The system was implemented for the purpose of using decision support features and member data storage. The following year, in 1968, the idea of electronic health data was reinforced by Dr. Larry Weed’s publication “Medical Records that Guide and Teach” promoting the advantages of problem oriented medical records for clinical documentation process. By the end of the 1960’s there were two new electronic health data software systems created in an attempt to digitalize and unify data [4]. One of the systems, Computer Stored Ambulatory Records, or COSTAR, was created by the Harvard Medical School. This software provides a system for storing medical data pertaining to a variety of healthcare settings. The Medical Record, or TMR, was the last electronic medical data software system introduced in the late 1960’s at Duke University.

In the 1970’s Technicon Medical Information Management System, or TMIS, was developed at the El Camino Hospital in California. This software was very efficient and was considered to be an innovative computerized system, which provided order entry. Since the 1970’s, EHR software systems have continued to add different functions, which allow health plan members, physicians and other healthcare providers to interact. In 2004 President George W. Bush made a statement claiming that the majority of Americans would have an EHR in the next ten years [5]. Five years later, in 2009, President Barack Obama issued a requirement for a national EHR system to be created for the year 2014 [6].

Overall, EHR has become an effective tool for storing, exchanging and accessing data. These systems have the ability to obtain a health plan member’s medical history, medication, allergies, immunization status, laboratory test results, radiology images, vital signs, and other personal attributes such as age, weight, height, gender, and billing information. New York Presbyterian Hospital has merged member and healthcare provider’s data by creating “MyNYP.org” [7]. This site enables the health plan member to access, store and exchange their medical information online. MyNYP.org runs on a Microsoft platform and requires a registration process before health plan member can access the data. The registration process starts with the member creating a Microsoft Health Vault account, and agreeing to privacy consent forms from the hospital. There are two types of security consent forms such as Protected Health Information, or PHI. The PHI form ensures that only users will view the medical data. Another form is the Sensitive Protected Information form, or SPHI form, necessary for members with HIV/AIDS, substance abuse, and mental health issues. In essence, these two forms are used to protect the member’s medical history.

Personal Health Record, or PHR, is another digital medical information platform. The difference with this system is that the health plan member manages their records. PHR contains information related to the care of the healthcare member entered by clinicians, physicians and medical providers. This record also contains health plan member billing information, which can be accessed for insurance purposes. PHR is also available in a mobile application. The application may contain health plan member-reported outcome data, lab results, and data extracted from biometric devices [8].

These EHR software systems are also being implemented in fitness centers. For instance, EZFacility has become the most popular systems implemented within fitness centers. Through the use of this software, fitness club’s staff and members can easily access membership information, trainers, scheduled appointments, personalized nutrition programs, and billing [9]. EZFacility also has a mobile application known as MemberME, which has the ability to facilitate communication between members and fitness center staff. MemberMe is an effective method for members to search for and book classes,
view facility information, staff bios, events, promotions, photos, and videos. Overall, self-health applications can benefit many sectors of the healthcare industry, such as medical providers, pharmacies, health plan members and even gym members. Similar applications exist within the telehealth industry, which can revolutionize healthcare and improved retention levels [10].

3. Current and Emerging Telehealth Solutions, from Clinical to Consumer

In recent years, there has been an increase in the demand for telehealth implementation. These technologies have the ability to effectively automate processes, coordinate care and connect healthcare providers and health plan members in a seamless manner. In addition, telehealth technology is key to decreasing costs, such as hospital readmissions, which is why there is a need for more efficient healthcare delivery models [11]. The goal of these new models is to reduce unnecessary doctor visits and keep chronically ill patients out of the hospital and in the comfort of their own home.

In order to introduce these new methods in the healthcare industry, health plan members must assimilate themselves with biometric devices. An emerging trend within the telehealth industry is the development of biometric or self-health devices. Through the use of Fitbit, MapMyRide, and any of the iHealth devices, consumers have the ability to participate in self-health management.

Fitbit is a wireless fitness tracker that syncs to a computer, Smartphone or tablet. The Fitbit device tracks calories burned, the number of flights of stairs climbed, distance walked, weight, calories in vs. calories out, diet, training, and sleep patterns [12]. All of this data can be tracked, organized and graphed in the application.

Another application is MapMyRide, which is designed to track fitness activities, such as bike riding; this data is collected on a GPS system within the Smart device [13]. The device can obtain data such as the distance, speed, and calories burned. In addition, other information can be uploaded and combined with other systems in order to provide a comprehensive overview of a user’s workout trends. Fitbit and MapMyRide are only two examples of devices that available to consumers. In addition to these, there are numerous applications that exist for iOS and Android.

Another recent progression within the medical industry is the virtual interaction between health plan members and doctors. Rather than physically visiting the doctor’s office a healthcare member, or caregiver, can communicate with their healthcare provider through multiple channels. By utilizing voice and video conferencing, online file sharing, and real time reporting, healthcare members...
and doctors can facilitate virtual visits, which could be implemented through a cloud computing platform.

Typically, the cloud solution would be Software as a Service, or SaaS. For instance, the company CloudVisit is based on a SaaS platform. CloudVisit provides “easy-to-use tools for scheduling, conducting, and tracking web-based patient appointments. Now, with high-definition video quality and multi-chat connectivity, CloudVisit has enhanced their features to more successfully replicate the in-office experience” [14]. It is essential that the interface is user-friendly and easy to navigate, as it will have to be comprehensible to all health plan members. In order for the system to be effective, the interface must display a clear and concise report of the health plan member’s EHR.

Another example is MeMD, an application that facilitates video consultations between a doctor and a health plan member in order to receive personal care and treatment. Once the health plan member has been diagnosed, the physician can send the pharmacy an e-prescription. A more advanced application is OnePass, created by Emerge MD. Unlike the MeMD application, OnePass is “the only telehealth cloud platform that can securely connect all the people, processes and technology involved in virtual care” [15]. OnePass is unique as it has the ability to integrate care teams from all different offices and locations. OnePass can securely collaborate and share EHR seamlessly from a Smartphone or tablet.

It is apparent that biometric devices and applications are appealing to health conscious consumers. A recent article in Health Management Technology discusses the trends of consumers managing their own health. The article states: “Consumers should be the stewards of their PHI with the ability to access their medical utilization information at anytime, anywhere” [16]. In essence, consumers want to be in more control of their health management, particularly their records. A recent study shows that “83 percent of patients surveyed want to access personal medication information [and] 72 percent of patients surveyed want to book, change, or cancel appointments online [17]. Through applications and biometric devices, healthcare members can obtain daily readings of their vital signs, which may include heart rate, blood pressure, blood sugar, oxygen level, and even record data such as sleeping patterns, hygiene, consumption of medicine and daily exercise. With the use of these tools, healthcare members have a better understanding of their own health condition, thus improving healthcare decision-making.

A specific example would be a diabetic patient routinely using an insulin pump. Due to their condition, they must regularly record their blood sugar data. Through a biometric device and application, the data would be collected over time and could be displayed graphically. Recording the data through a cloud-based application would be allow healthcare providers to review and analyze the patient’s extensive blood sugar history. Collecting and recording blood sugar data over several months provides a comprehensive understanding of the patient’s condition. In addition, this data can be compared and correlated with the other lifestyle events and vital signs. With the use of the biometric device and application, the healthcare provider could provide higher quality care by making more effective suggestions, thus producing more effective outcomes [18].

Another health condition that could benefit from a biometric device is sleep apnea. Dr. Carol Ash, Director of Sleep Medicine at Meridian Health, states that “when you look at sleep disorders, and how we're not getting enough sleep -- this is the biggest public health issue facing society today” [19]. Chronic health problems, such as depression, stroke, obesity, depression, kidney disease, high blood pressure, and heart disease are all linked to insufficient sleep [20]. Continuous Positive Airway Pressure, or CPAP, devices gather data pertinent to sleeping patterns. This data is gathered over time and can give healthcare providers a long-term overview of the patient’s sleep patterns. This data enables the healthcare provider to review and suggest modifications if necessary.

The Smart Bed, manufactured by Sleep Number, is a bed that monitors sleep. With voice commands, the bed can be directed to modify the firmness or elevation. The bed can even be directed to perform a massage [21]. Most importantly, the bed collects a number of data points including the health plan member’s breathing rate, movement, and heart rate. The data is collected and wirelessly transmitted to a tablet or mobile device. Sleeping patterns and all other data is stored in application and can even provide suggestions on how to improve sleep. With the iOS application and web interface, users can track other life activities that may impact sleeping patterns such as exercise, television usage, and nutrition.

Each of these telehealth products is available to consumers. The next segment of telehealth would be to provide universal healthcare that gathers all of the data from these devices and applications. In doing so, each health plan member will have a cohesive health record that is accessible to all spectrums of the
healthcare industry. Essentially, this would create one platform for health records. For instance, a cardiologist could view the sleeping pattern results of the sleep apnea health plan member, or in this case the patient, and compare it with the pulmonary doctor’s comments and recommendations. In addition, an endocrinologist may analyze the impact of their diet and exercise on their blood sugar level. Through the use of interoperable data, the endocrinologist could suggest that the patient needs to alter their diet. The patient’s extensive EHR could also reach another level of care, such as the emergency room. Through SaaS the hospital ER could review a patient’s history in real time. By reviewing the EHR, the ER doctor will be informed that the patient is a diabetic or that they have a sleeping disorder. Ultimately, the goal is to create a universal, cloud-based system that collects and stores data making it available to patients, or health plan members, and physicians, thus creating better care.

Figure 4: shows your PHN
Personal Health Network

Figure 5: shows the Big Picture
Telehealth Network Cloud

5. Opportunities and barriers to innovation in the management and use of health data

The opportunities for emerging telehealth solutions are limitless. A company known as Healthbox is a venture capitalist firm that strives to stimulate innovation and streamline EHRs within the telehealth industry. The firm’s goal is “to identify high-potential healthcare technology startups that address the meaningful industry challenges and provide them with the resources, support and network to enable rapid development and growth” in telehealth [22]. Currently Healthbox has invested in almost 60 startup companies, each exhibiting a different outlook of telehealth.

An example of a future telehealth solution is the uBox, created by Abiogenix. The uBox is a Smart pillbox used to improve the health plan member’s care management by monitoring their medication intake. As explained on Healthbox, “the uBox reminds patients when a dose is due, records when it is actually dispensed, limits inappropriate access to medication and alerts clinicians or loved ones in the event a dose is missed. With a simple and intuitive user-centric design, the process is as seamless for patients as possible” [23]. The uBox product has not been released yet but is available for preorder. Currently, Abiogenix is adopting FDA guidelines to make the uBox reimbursable by insurance companies. Despite the upside to the uBox, there are also challenges involved. For instance, one may ask if an elderly
individual, lacking technical skills, will understand and agree to use the device. These are some challenges which innovators face when creating a telehealth application or device geared towards older generations.

Deploying robot technology is another emerging telehealth solution, which is expanding beyond the limits of existing software applications. According to a recent Forbes article, titled “Top 10 Investor Interests for Technology 2014”, robotic helpers will be launched within the healthcare industry [24]. In doing so, the cost of elderly care will reduce while providing more individual assistance through the robots. A company known as Savioke creates autonomous robot helpers in hope that one day personal robots will be able to help people with illnesses and disabilities.

According to a Wired magazine article, the company “HealthSpot takes [telehealth] to the next level by combining teleconferencing with basic medical equipment like a stethoscope and blood pressure monitor in a kiosk that lets you see a doctor without actually visiting one” [25]. Essentially, the company is integrating biometric devices into one system. This concept is seemingly effective; however it is somewhat inconvenient as it still requires the health plan member to leave their home to access care. The overall challenge is to “[collect] the right data, [aggregate] that data and [present] it in a usable format that can impact healthcare decisions” [26]. There are many medical tools available to the consumer, along with devices and systems, some of which are still in the infancy stage.

Ultimately, the challenge is to create a platform that is universally interoperable with medical devices and digital health tools. As stated in a recent article, the key is to create a central repository of information and be able to “send information to the repository and pull it out wherever you need it and it’s up to date and you can trust it” [27]. It would be beneficial if the platform collected and shared biometric data, lab results, x-rays, e-prescriptions, and analytical data amongst all healthcare stakeholders.

With the proper use of this technology, healthcare providers will be able to remotely monitor the health plan members on a more frequent basis. In doing so, healthcare providers can play an active role in their health plan members’ care, while monitoring their condition and health status on a detailed level. In order for the implementation of these telehealth solutions to be successful, there are several obstacles that must be overcome. Due to the government’s strong interest in EHR, there are many complex ethical, political and social issues that must be addressed.

4. Laws, regulations and standards governing the management of health information

In terms of legislation, there are many challenges regarding the adoption and implementation of telehealth technologies. It is known throughout the industry that “telehealth raises a number of legal concerns, especially regarding cross-state practice and reimbursement” [28]. Currently, healthcare governance is focused on a secure delivery of healthcare EHRs from hospitals, primary physicians and insurance providers. According to Tom Daschle, a former US Senator, “telehealth services are rapidly becoming a very important part of healthcare delivery under the new paradigm, but we unfortunately don’t have a regulatory environment or policy environment that accommodates new technology” [29]. This statement clarifies that the most challenging concern is that telehealth must abide by the laws, rules and regulations of the United States government. The guidelines of the Health Information Technology for Economic and Clinical Health Act, or the HITECH Act, ensure the adoption of medical technology. This act establishes connectivity to the public health community in case of emergencies. Most importantly, this act assures that the workforce is properly trained and equipped to use EHRs.

The most important law each stakeholder must consider is the Health Insurance Portability and Accountability Act, commonly referred to as HIPAA, which was created in 1996. This act is enforced to protect patients’ health records, improve the effectiveness of healthcare and reduce fraud by carefully securing health data. HIPAA applies to all covered entities, defined by the rule to include health plans, healthcare clearinghouses, and healthcare providers that transmit specific information electronically [30]. HIPAA privacy regulations are crucial when it comes to the evolution of EHRs. In terms of telemedicine, there are many issues that must be addressed in order comply with HIPAA.

With the evolution of telehealth, virtual exams will become an ordinary occurrence within the healthcare industry. Some are cynical about patient and doctor video exams, as it is difficult to determine if there is an unknown person in the room during the exam. The unknown person could be in the room listening but not in the visibility of the camera. If this
were to occur, the physician would be violating the HIPAA law, as they are responsible for maintaining patient confidentiality.

Another concern is the reliability of data and the implications associated with the loss or alteration to data. May stakeholders are concerned about the exposure of personal information due to cyber storage breaches. Another issue is the increase in the number of people who will have access to EHRs. In addition to the medical team viewing the EHRs, there will also be a technical team to administer and maintain the system. As a result, there is a likely increase in fraud. Overall the “storage of electronic files, images, audio/video tapes etc., needs to be done with the same precaution and care ascribed to paper documents” [31].

As more people adopt telehealth technology, there will be an increase in demand for telehealth and home healthcare. The Fostering Independence through Technology (FITT) Act of 2013 was introduced and referred to a congressional committee on March 18th in an effort to facilitate in-home healthcare and offsite patient monitoring projects under the Medicare program. The main incentive of these projects would be to reduce costs that are incurred through hospital readmission and avoidable doctor visits. According to the bill, Congress has found that “allowing seniors to remain in their homes longer can delay unnecessary, costly transfers to higher acuity care settings [and] due to changes enacted by Congress, hospitals are facing payment penalties for patients that are readmitted to the hospital within 30 days of discharge” [32]. As the Baby Boom generation continues to age, telehealth will begin to flourish.

The Agency for Healthcare Research and Quality, commonly known as AHRQ, strives to achieve many goals concerning telehealth. AHRQ focuses on improving healthcare decision-making and supports patient-centered care in hope to improve the quality and safety of medication management and accessibility to healthcare [33]. In addition, the Home Care Technology Association of America (HCTAA) is working with policymakers, law makers and the Executive Branch agencies to address challenges associated with the implementation of telehealth. With the help and influence of AHRQ, HCTAA, the FDA, and other government agencies, telehealth will continue to prosper within the nation. In doing so, healthcare providers can continue to facilitate the adoption of telehealth, which will benefit society as a whole.

References


