

## EHRs IN LONG-TERM AND ACUTE CARE FACILITIES: A PILOT STUDY

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### Abstract

*The development of electronic health records (EHR) has progressed over the past several years as a result of HIPPA, HITECH, and the ACA. These mandates have led to a healthy creation of competitive systems that are designed to meet the legal requirements, as well as, the needs of healthcare providers. In long-term care and acute care settings, there are differences in patients and the delivery of care that are distinctly unique. However, patients, especially the elderly population, often flow back and forth as well as into and out of these healthcare settings. Have electronic health record systems developed with enough flexibility and design capacity to accommodate the patients in both long-term care and acute care, and to facilitate transfer of EHR data between these settings? In a pilot study, a comparison is made of two market leaders in each of these areas and an analysis of the design and interface capabilities of the two systems is evaluated to determine the ability of these systems to work across both settings.*

**Key words:** EPIC, PCC, EHR, LTC, acute care.

### Introduction

The development of electronic health records (EHRs) encompasses a long period of time. However, most of the progress has been accomplished recently.<sup>1-6</sup> Healthcare experts and policymakers consider health information technologies to be critical towards improving quality and efficiency in the United States (US) healthcare industry.<sup>7-14</sup> There are three legislative factors that were influential behind the adoption of EHRs

in the US for healthcare organizations. These are the Health Insurance Portability and Accountability Act (HIPAA), the Health Information Technology for Economic and Clinical Health (HITECH), and the Affordable Care Act (ACA) legislation. With these three driving forces, a majority of healthcare providers are utilizing EHRs and have implemented a system, or have replaced their original systems with a more advanced one.

There is agreement regarding the potential value of EHRs for improving efficiency and quality in medicine.<sup>7,10-14</sup> There are eight core functions for EHRs that have subsequently been used as the baseline for the HITECH Act to foster EHR deployment.<sup>15</sup> The HITECH Act includes incentive payments for healthcare facilities that have significant proportions of Medicaid and Medicare patients in their patient populations and can demonstrate “meaningful use” of an EHR, as well as payment adjustments or penalties for healthcare facilities that are not making sufficient progress.<sup>16, 17</sup> As of 2014 over 3,000 eligible hospitals have collected almost \$10 billion in Medicare “meaningful use” incentive payments.<sup>18</sup>

The legislative factor that is having a profound effect not only on Healthcare Information Technology (HIT) but also on the EHRs is the enactment of HIPAA. This legislation, contains “administrative simplification” provisions requiring the HHS to establish national standards for electronic healthcare transactions and code sets, security standards for electronic records, and national identifiers for providers, health plans and employers.<sup>16, 17</sup> The HITECH Act expanded the privacy and security rules of HIPAA to include these requirements to all HIPAA covered entities and their “business associates,” as well as the establishment of mandatory federal security breach reporting requirements, and new criminal and civil penalties for non-compliance.<sup>16-19</sup>

Amid the development of EHRs, tremendous change has also taken place in the delivery of healthcare services for acute and long-term care (LTC). These changes include the entry of new health care providers, treatments, and technologies. These advancements have increased the quality of life and life span especially for the elderly and this population is increasing due to the entry of the baby boomer generation. In the US, approximately 50 million people are aged 65 years and older and this number is estimated to increase to almost 22% of the population.<sup>20</sup> The elderly are a diverse group with a multitude of health issues and two-thirds will need LTC sometime during their lifetime.<sup>21</sup> The necessity of LTC services is dependent upon an older persons’ functional limitations or need for assistance of activities of daily living (ADLs). LTC encompasses a range of services in a variety of settings which include community-based and institutionally-based facilities, alternative housing arrangements, or residential communities.<sup>22-25</sup> In the US, there are 4,800 adult day care centers, 12,200 home health agencies, 3,700 hospices, 15,700 nursing homes and 22,200 assisted living and retirement care communities and these facilities are growing.<sup>22</sup> Acute care facilities provide short-term treatment for episodes of illnesses, severe injuries, urgent medical conditions. Acute care facilities include emergency departments (ED), urgent care clinics (UCC) and ambulatory surgery centers (ASCs). Depending upon the facility, the type of care provided will vary.<sup>23</sup> In the US, 15% of ED were made by people aged 65 years and older and 11.9% of ED visits were made by nursing home residents.<sup>26-28</sup> The utilization of the ED for injuries, such as unintentional falls and acute illnesses related to chronic conditions is expected to increase in the future, which can lead to hospital admissions and possible discharge to a LTC facility for subacute, post-acute care or rehabilitation.<sup>23</sup>

To enhance the continuity of care among the elderly as they transition from one healthcare venue to another, it is important for these healthcare facilities to have compatible EHRs that have the ability to function

together for access to medical records and ease of communication between providers. This accessibility can decrease medical errors, duplication of services/treatments, improve patient outcomes, and reduce medical costs.

While the mandates are the driving factors for EHRs, the current drivers are more clinically oriented. The delivery of healthcare services in LTC and acute care leads to the belief that EHR systems may also have differences. If that is true, how do EHR systems differ and are they compatible with patients' clinical needs both in and between settings? By comparing two EHR systems in both long-term and acute care, an evaluation can be done to determine similarities and differences between the two systems, as well as their interface capabilities.

## Methods

The methodology is two-fold. First we did a comparison of two common EHR systems that are being utilized in long-term and acute care organizations. Second, we utilized a series of personal interviews with current users of both EHR systems to determine the similarities and differences, their functional interface capabilities, and to understand what factors are barriers to the utilization and exchange of the standard continuity of care document (CCD).

## Results

Considering the policy and mandated drivers for the development and deployment of EHR systems (Table 1) and following the current descriptions of long-term and acute care (Table 2), the EHR systems utilized in each market is informative. The results of this study indicate that the most commonly used EHR system in the LTC market is Point Click Care (PCC) and Epic for acute care markets. The differences between PCC and Epic are summarized in Table 3. PointClickCare is a System as a Service (SaaS) while Epic is designed around a single database, using Chronicles Extended Relational Database Management System and integrated applications that do not require interfaces.<sup>29, 30</sup> Both PCC and Epic also provide direct messaging using Secure Simple Mail Transfer Protocol (SSMTP).

**Table 1. EHR Development and Deployment timeline**

Date	Summary
1976	Studies quantified effectiveness of computer-generated reminders
1990	Late 1990's listed Computer-based Patient Record (CPR) listed basic criteria for EHRs by the IOM
2003	Basic EHR criteria updated by IOM and included eight core functions
2010	Passage of the Affordable Care Act, emphasizes use of EHRs
2011	HITECH Act provides incentive payments for healthcare facilities with large pool of Medicaid and Medicare patients that can show EHR "meaningful use" criteria is in place. LTC providers are not eligible for incentive payments
2011	HIPPA included language to establish administrative simplification - national standard for records, national identifiers for providers, health plans and employers.
2012	HITECH Act expanded privacy and security rules to include all HIPPA covered entities and their business associates, establishment of mandatory federal security breach reporting requirements; establishment of new criminal and civil penalties for non-compliance.
2014	Penalties for eligible hospitals that receive Medicare payments who have not adopted "meaningful use"
2015	Penalties for eligible critical access hospitals that receive Medicare payments who have not adopted "meaningful use"

**Table 2. Long-Term Care and Acute Care Settings<sup>22-26</sup>**

<b>LTC Setting</b>	<b>Services offered</b>
<b>Community-Based Programs</b>	
<b>Adult day-care</b>	Seniors who need supervision during the day Respite care for caregivers Services provided dependent upon the type of facility Provides socialization, organized activities, clinical interventions, rehabilitation programs, specialized programs based on need.
<b>Home health</b>	Variety of healthcare programs/services dependent upon the senior's health status from chronic illness to disabilities. Care provided at home by various healthcare providers to include services such as nursing services, physical therapy, occupational therapy, speech therapy Custodial services such as housekeeping and grocery shopping
<b>Hospice</b>	End of life care and assistance
<b>Meals-on-wheels</b>	Provides meals to home-bound seniors
<b>Senior Centers</b>	Provides socialization among the elderly who do not have any ADL limitations. Some may provide educational programs such as management of chronic illnesses
<b>Institutionally-Based Programs</b>	
<b>Skilled nursing facilities (SNFs)</b>	Provide 24-hour nursing care Sub-acute care upon discharge from a hospital after surgery Physical therapy, speech therapy, occupational therapy, memory care, wound care. May include special care units such as Alzheimer's or hospice
<b>Assisted living</b>	Allow the elderly with some difficulty in performing ADLs. Live independently, but have 24-hour access to healthcare providers or medical assistance.
<b>Independent living</b>	Independent living for elderly 55 years and older who do not need any medical or nursing care. Can perform ADLs without assistance.
<b>Continuing Retirement Communities (CCRCs)</b>	Continuum of care from independent living facilities to SNF in the same community. Provides a safety net as the need arises for increased healthcare services or support due to chronic or acute illnesses.
<b>Acute Care Settings</b>	
<b>Hospital-based facilities</b>	Emergency departments (EDs), intensive care units (ICUs), neonatal intensive care units (NICUs), and coronary care or cardiology units
<b>Urgent care centers</b>	Provide non-emergent care as well as diagnostic and preventive services such as yearly physicals' and recommended vaccines.
<b>Acute care facilities</b>	Provide same-day surgeries as well as diagnostic and preventative services such as gastrointestinal (colonoscopy), ophthalmology (cataract removal), orthopedics (hip/knee replacement) and pain management.

The PCC EHR system is a comprehensive system completely designed exclusively for the long-term care market. Currently over 9,000 senior care homes are using this software while managing 750,000 patient records.<sup>29</sup> The preferred method for providers to connect with other organizations and providers is point-to-point, which PCC uses.

Epic is a comprehensive EHR system focused on acute and ambulatory care organizations. Epic provides integrated patient care coordination capabilities through its Healthy Planet population health suite. Two interface modules in Healthy Planet are "EpicCare Link" and "Care Everywhere".<sup>30</sup> EpicCare Link provides secure, web-based access to information by providers external to the acute care facility, while Care Everywhere is a Health Information Exchange (HIE) program, providing a point-to-point framework for interoperability.<sup>30</sup> EpicCare Link external providers can access progress notes, lab results, discharge instructions, consult notes, and other portions of patients' charts, while Care Everywhere lets users identify where a patient may have been seen previously, and request those records. Additionally, Epic can customize installations to the customer's demands and needs.

Although these are two different EHR systems, both PCC and Epic claim the ability to share patient records. While the functional capability exists there is little evidence of utilization. It seems that both long-term and acute care providers begin with new patients by creating new records in their respective systems.

Through the series of interviews, this study revealed that there is a limited exchange of CCDs between the users of PCC and Epic. This study identified three barriers toward greater exchange of CCDs between users of PCC and Epic. First is the increasing complexity of EHR systems coupled with their accelerating use as driven by government policies and the payer market, have forced users into a "heads down" approach. So much is happening within the confines of their own organizations and the implementation of their systems, that little time is left for working out issues related to electronic exchanges with facilities that are not part of their integrated system. Less priority is given to other institutions, especially if these are not vertically integrated with the acute care or LTC facility. Second, some users are yet to be convinced that changing the way things are traditionally done should change. Third, for some users of EHRs in LTC, it is better to manually enter all of the MDS data than using the facts and figures that are available electronically because there is the sense of having a better understanding of a patient, the patient's needs, and the family's concerns when the time is taken to sit down with a family and conduct the interviews. The ability to listen to the patient and family seems to supersede the extra time that is required to reenter medication orders, histories, etc.

**Table 3. Comparisons between PointClickCare and Epic EHR systems**

<b>Dimension</b>	<b>PointClickCare</b>	<b>Epic</b>
<b>General information</b>	Ontario, Canada	Wisconsin, United States. Private company founded in 1979. Has international presence in the Netherlands, Dubai and Singapore. Develops, installs and supports all applications in-house. Leadership team includes clinicians, developers and process experts.
<b>System/Service</b>	<ul style="list-style-type: none"> <li>• System as a Service (SaaS) using cloud-based services. Allows easy scalability according to each user's need.</li> <li>• Technical capability for exchange of discrete data messages using HL7 and NCPDP. Can use point-to-point communication formats between two systems.</li> <li>• Preferred method for providers to connect with other organizations and providers.</li> <li>• Direct messaging using SSMTTP</li> </ul>	<ul style="list-style-type: none"> <li>• Single data-base system, using Chronicles Extended Relational Database Management System and integrated applications that do not require interfaces.</li> <li>• Can send and receive HL7 and standard CCD/CCDA between providers using IETF<sup>a</sup>for XDR<sup>b</sup></li> <li>• Direct Messaging using SSMTTP</li> <li>• Provides entire infrastructure at a central site operated and controlled by the cloud vendor</li> </ul>
<b>Primary Use</b>	Long-term care organizations/facilities	Acute-care and ambulatory care organizations/facilities
<b>Design Features</b>	<ul style="list-style-type: none"> <li>• Integration with MDS, RUGs and eINTERACT</li> <li>• Emphasis on care delivery management, financial management, marketing, business intelligence, quality and compliance.</li> </ul>	<ul style="list-style-type: none"> <li>• Applications include clinical systems for ambulatory, specialties, in-patient, connection with independent provider physicians and hospitals, hospital departments, and ancillary services.</li> <li>• Include a non-clinical system for financial and billing functions.</li> <li>• Has capability for LTC (module)</li> <li>• Healthy Planet provides interoperable patient data exchange systems: EpicCare Link and Care Everywhere.</li> <li>• On-site installations are customized for each organization/facility based on needs and demands</li> </ul>
<b>“Meaningful use” incentives</b>	Government incentives for “meaningful use” are not provided	Government incentives for “meaningful use” are provided for healthcare organizations who provide care for Medicare and Medicaid recipients.

<sup>a</sup>IETF (Internet Engineering Task Force); <sup>b</sup>XDR (External Data Representation)

## Discussion

In the US, the elements of the healthcare system that provide long-term care and acute care developed separately and independently. Until recently, the only possible exchanges of information between these two parts of the healthcare system were manual and labor intensive. Recent federal legislation, as well as a societal recognition of the need for greater efficiency in how healthcare is delivered, have spurred several initiatives to increase productivity, improve quality, and decrease costs through mechanization of this information exchange. However there are some issues with these policies. Under the HITECH Act, LTC providers are not eligible for incentive payments. The utilization of EHRs in the LTC setting is considered to be extremely important. For example, the Department Health and Human Services (HHS) quality measures that must be reported to avoid a 2% reduction to the annual payment update for LTC facilities "will be improved through better coordinated patient care and facilitated via EHR data collection and reporting."<sup>31</sup> Additionally, patients who are discharged by hospitals into LTC and other post-acute facilities often have chronic conditions, such as diabetes or hypertension, that lead to transitions between multiple care settings, and the need for ongoing communication to and from each service point. Shareable EHRs can help mitigate this problem and ultimately improve the health outcomes for patients as well as reducing costs to the healthcare system.

The technological standards for this have been developed and incorporated into vendors' EHR systems. The national electronic infrastructure to connect these various institutions and systems is well under development. Although the creation of direct interfaces between Epic acute care and PCC LTC facilities is possible, both companies seem to rely heavily on use of HIEs as the common point of exchange. Epic does have an HIE system for users of its systems, however general use HIEs and Regional Health Information Organizations (RHIO) are the more likely means for data exchange among all different vendor systems. Regional and state wide HIEs are currently functioning or planned in most states, and information exchange by hospitals increased significantly between 2008 and 2012; however data exchanges with unaffiliated providers and hospitals are currently limited.<sup>32</sup>

Nevertheless, the amount of information exchanged electronically between non-affiliated institutions has not grown as dramatically as once envisioned. In trying to understand why, we evaluated the predominant EHR systems at use in acute care settings (Epic) and in long term care settings (PCC) and we did not find any technical reasons why greater exchange of the patient's medical information between the two settings is not occurring. Based on initial interviews with users of both systems, it seems that most still view EHR systems as a means to improve quality of treatment within their own facilities, and have not been motivated (through training, management directives, etc.) to work as diligently on exchanging information with other institutions.

## Conclusion

The push for widespread use of EHRs in the US, including Federal incentives and penalties, is still relatively new. A system that provides for a health record that is available securely and electronically to any healthcare provider anywhere in the U.S. is an ultimate goal. Overcoming the technological challenges for achieving this may be the easiest part. Changing the healthcare culture so that healthcare personnel are highly motivated to achieve this ultimate goal may take longer. Further investigation is warranted to determine the behaviors and barriers of healthcare professionals, both the practitioners and the administrators that impede further integration of EHRs along the continuum of care.

### Authors' note

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