Chapter 13
Healthcare Systems using Clinical Data: Addressing Data Interoperability Challenges

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EXECUTIVE SUMMARY

The use of Information Systems (IS) in healthcare organizations is increasing. A variety of information systems have been implemented to support administrative activities such as scheduling systems, insurance and billing, electronic prescriptions, pharmaceutical dispensaries, and patient health records and portals. To make a fundamental difference in the delivery of patient care, systems that support important clinical healthcare decision processes are needed that leverage the clinical knowledge embedded in patient medical records. The aggregation of clinical data from multiple sources is difficult due to data interoperability issues. The VHA case study of the CICSP system illustrates a program that effectively leveraged clinical data from multiple surgical programs to build a system to support decision-making at many organizational levels. The technical and organizational practices from the VHA case provide important lessons to address interoperability issues when building other healthcare information systems.

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BACKGROUND

The use of Information Systems (IS) in healthcare organizations is on the increase. Among the reasons for this trend are pressures to reduce costs, which have been growing at an unsustainable rate and to improve the quality of healthcare (Warner, 2004). A variety of Information systems have been implemented in healthcare organizations such as scheduling systems, electronic medical records, computerized physician order entry, insurance and billing, electronic prescriptions, pharmaceutical dispensaries and patient health portals (LeRouge, Mantzana, & Wilson, 2007). Such applications range from automating administrative tasks such as billing, facilities management, laboratory management, and patient visit scheduling to clinical decision support and clinical program management.

The nature of organizations that participate in the United States (US) healthcare industry can vary greatly. They range from advanced practice critical care hospitals to outpatient clinics that provide primary care. Unlike in nationalized healthcare systems such as in UK or regionally organized systems such as in Canada, the US system is pluralistic where information system adoption decisions are left to each individual provider. However, the need to operate inside the US healthcare system requires each provider organization to adopt a variety of information systems to manage administrative activities, such as billing, scheduling, prescribing and storing patient medical records. Current research reports that larger the size of the healthcare organization, such as a hospital, health maintenance practice or health network (HMO), the greater the adoption of technology (Ozdemir, Barron, & Bandyopadhyay, 2011). Information systems, such as the just-in-time KM at Partners HealthCare (Davenport & Glaser, 2002) and the computerized physician order-entry system at CareGroup (Grimson, Grimson, & Hasselbring, 2000) have reduced medical errors, which cause an estimated million injuries and 98,000 deaths each year in the USA alone. Such systems have been found to be effective to facilitate coordination and mutual communication among clinicians across the many silos of specialization in the organization and have reduced medical practice errors (Aron, et al., 2011). In addition, these systems can reduce costs and help healthcare professionals to cope with information overload and to learn about and utilize current research developments into their practice. While a majority of these information systems support administrative tasks and are built using administrative or resource utilization data sets, yet to make a fundamental difference in the healthcare organization and its effectiveness in the delivery of patient care, systems that support important clinical healthcare processes are needed (Raghupathi & Tan, 2008). With the growth in the adoption of Electronic Medical Records (EMR) by healthcare providers, more patient data is now available to utilize in the practice of Evidence-Based Medicine (EBM). The Health Information Technology for Economic and Clinical Health (HITECH)
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