Electronic Health Records: Current Issues in Oncology

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The electronic world continues to advance in the 21st century. In 2009, the American Recovery and Reinvestment Act (ARRA) and the Health Information Technology for Economic and Clinical Health (HITECH) Act were enacted; in response, hospitals and oncology physician offices have or are implementing electronic health records (EHRs). As with any new technology or process, a steep learning curve is associated with the implementation of EHRs. Often, the full impact of a sweeping, nationwide change such as EHRs is not realized for many years after implementation, and many suppositions about the usefulness and benefits of EHRs still exist. The current article focuses on the initial impact of EHRs, their role in diagnosis, and the responses of healthcare providers in patient outcomes and in research.

Initial Impact of Electronic Health Records

In 2008, prior to ARRA and HITECH, less than 2% of hospitals (excluding the Veterans Health Administration) had comprehensive EHR systems, and less than 8% had basic systems (Caligtan & Dykes, 2011). Since then, 55%–57% of all physicians have adopted some level of EHR (DesRoches, Painter, & Jha, 2012; Jamoom et al., 2012), and the questions that follow are whether care improves, how healthcare costs are affected, and what associated risks or abuses occur?

A study from the Centers for Disease Control and Prevention's National Center for Health Statistics survey of 2011 trends showed that 85% of all physicians with EHRs are satisfied with their system, and 74% reported that EHRs enhanced their overall patient care (DesRoches et al., 2012). The survey also reported that 41% of physicians ordered more on-formulary medicines, and 29% ordered fewer laboratory tests because of electronic access to test results (DesRoches et al., 2012). In a *New York Times* article, Abelson, Crewell, and Palmer (2012) focused on the cost of EHR implementation. They stated that the goal of implementing EHRs was to improve efficiency, patient safety, and to reduce healthcare costs. Since the implementation of EHRs, hospitals received $1 billion more in Medicare reimbursement in 2010 versus 2005, and aggressive billing by a small subset of physicians may have cost Medicare $100 million in 2010 alone (Abelson et al., 2012). An electronic system's ability to capture and analyze all data entered contributes to billing at the highest level possible for services rendered. Overbilling, an abuse of the system, can occur if healthcare providers choose an electronic option that populates multiple fields, whether or not the actions all occurred. Some of the biggest risks associated with EHRs are the possibilities of the host server going down, back-up failure, or power failure.

A specific issue related to oncology practices is the need for access to multiple systems and areas. Physician practices may be independent of hospitals, however, the system still needs to communicate with the hospital, the radiation therapy location, and home health care. Medical EHR systems frequently are not set up like hospital or radiation therapy systems; therefore, requiring coordination across service providers makes the choice of EHR system more complicated. The complicated nature of EHR in oncology was the basis for the development of the CICERO model (Comprehensive, Integrated, Customized Electronic Records for Oncology), which provided a framework for evaluating oncology-specific EHRs (Poulter, Gannon, & Bath, 2012).

Benefits associated with EHRs are numerous and may have clinical, organizational, and societal outcomes (Menachemi & Collum, 2011) (see Figure 1). Improvements in quality of care, patient safety, and patient outcome measures, as well as fewer treatment errors, are possible clinical outcomes. Organizational outcomes are seen in improved patient and healthcare provider satisfaction and efficient financial and operational performance. Improved data collection contribute to societal benefits through research and support of evidence-based care. Much of the current literature reflects data obtained from academic institutions and large health maintenance organizations where integrated EHRs were first implemented. More community oncology practices have adopted EHRs and are noting similar outcomes (Presant, Bosserman, McNatt, & Emilio, 2011).

Electronic Health Record Use in Medical Decision Making

Having the most up-to-date clinical, evidence-based, and research information at one's fingertips is not far away. Digitized cancer registry systems can improve documentation quality, and accurate cancer registry data improves monitoring for cancer trends and more easily recognizes cancer patterns (Houser, Colquitt, Clements, & Hart-Hester, 2012). Another potentially significant benefit of oncology EHRs is the development of computer-aided diagnostic software that can capture patient-reported information and analyze the information in a personalized context inclusive of previously reported patient outcomes, current patient issues, and actions

Benefits

Clinical outcomes
- Improved quality of care and patient safety
- Reduced medical and medication errors
- Increased adherence to evidence-based clinical guidelines

Organizational outcomes
- Optimized financial and operational performance
- Greater adoption of health information technology
- Improved legal and regulatory compliance
- Patient and healthcare provider satisfaction

Societal outcomes
- Conduction of research
- Improved population health

Drawbacks

Financial issues
- Adoption and implementation costs
- Maintenance costs
- Loss of revenue associated with loss of productivity (e.g., offline)

Changes in the workplace
- Learning to use the system

Patient privacy violations
- Electronic exchange of health information
- Employee misuse of data
- Hacking of data sites

Figure 1. Electronic Health Records: Benefits and Drawbacks

Note. Based on information from Menachemi & Collum, 2011.

recommended to address the issues and alter future care in response (Abernethy et al., 2010; Kerr, Lau, Owens, & Trefler, 2012). Once computer-aided diagnostic software is developed, tested, and generally available, the potential for significant changes in disease and side-effect treatment decision-making is extraordinary.

The rapid increase in electronic health data has implications for patients and healthcare providers. What data should be shared electronically with patients? Can patients understand the data without a conversation with a healthcare provider? And, if so, how well? Those are a few of the questions that are raised with the expansion of electronic health information. Various levels of patient portals allow patients to access billing services, make appointments, obtain educational materials, communicate with providers, and access test results. A study by Rodriguez, Thom, and Schneider (2011) examined nurse and physician views on patient access to test results prior to and after implementation of a patient online laboratory results page. Overall, nurses and physicians reported increased comfort with patients accessing laboratory results as well as increased belief that patients should have access to results and that patients could accurately interpret test results (nurses, 36%–43%; physicians, 3%–13%) (Rodriguez et al., 2011). A qualitative study by Fisher, Bhavnani, and Winfield (2009) explored how patients used the access to their full health records. They suggested that shared decision-making and management of care improved because of increased patient participation in care, increased quality of care because of better communication, and increased use of self-care strategies.

Patient-Reported Outcomes

Patient-reported data has been a major component of information used for clinical decision-making. Prior to EHRs, patient-reported outcomes (PROs) primarily were entered into the medical record as healthcare providers' documentation of patients' assessments and interviews. Patients participating in clinical trials may have completed or been asked questions regarding a preset data collection form. Data retrieval primarily occurred through chart reviews or audits. The advent of the EHR allows for more rapid and standardized documentation of clinical data—patient-reported, healthcare provider assessed, and test results. The EHR also has allowed multiple options for recording same or similar data. PROs can improve care by identifying important symptoms; however, standard measures of PROs and user-friendly methods of obtaining the data are needed to realize the full potential of patient-reported symptom, psychosocial, and behavioral data (Bennett, Jensen, & Basch, 2012; Glasgow, Kaplan, Ockene, Fisher, & Emmons, 2012). Current oncology-related initiatives for identifying standardized measures of PROs include the Grid-Enabled Measures (GEM) project and the Patient-Reported Outcome Measurement Information System (PROMIS) initiative (Glasgow et al., 2012). The two initiatives have banks of psychometrically validated items for assessing physical and psychosocial factors related to cancer treatment.

Looking to the Future

EHRs are positioned to strongly impact oncology research. The use of EHR data, including PROs, is only as good as the data collected. The GEM and PROMIS initiatives are designed to provide a collection of items that can be used individually or as a whole to measure physical and psychosocial factors. Integrated links of International Classification of Disease (ICD)-9 (and soon ICD-10) codes to PROs and clinical trial information are essential to the value of EHRs in research activities. Cancer research findings will be used to improve and individualize patient care (Ronquillo, 2012), provide rapid responses to new data affecting clinical treatment (Abernethy et al., 2010), and affect healthcare policy (Ronquillo, 2012). A second major issue related to EHRs is the concern that health information exchange can occur across unaffiliated providers instead of system-specific silos (DesRoches et al., 2012). Data collection without the ability to share or combine for analysis is not an improvement from previous paper-based systems.

Many opportunities exist for advancing health care in conjunction with EHRs. Staggered implementation of EHRs into hospital, clinic, and community physician practices may contribute to poor communication across electronic systems. Five main systems of PROs currently are used in oncology clinical care in the United States (Bennett et al., 2012). Some are adding statistical functions to compare individuals with similar patients in the database. One of the most commonly used EHR, Epic, was expected to add a PRO module to its system in late 2012 that includes PROMIS Short Forms that assess basic patient issues such as pain, sleep, and depression (Bennett et al., 2012). Oncology nurses purposively need to review current information related to EHRs and reports of the impact of the HITECH Act.

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