Electronic health record systems: risks and benefits

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This special issue of JAMIA presents several applications of electronic health record (EHR) systems for clinical decision making. The integration of genetic information into EHRs has been receiving a lot of attention in the past few years. Wilcox et al (see page e117) describe the implementation of a user interface in an EHR that resulted in timely dissemination of gene variant information to clinicians. Lærum et al (see page e143) describe results of a qualitative study showing physicians’ positive reactions to automated genetic information. Bell et al (see page e93) report on the development, implementation and evaluation of a clinical decision support system (CDSS) for pharmacogenomics, showing high adherence to prescriptions guided by their system.

The use of the EHR itself may result in improved process outcomes. Rand et al (see page e152) describe how its presence resulted in an increased number of counselling topics being delivered in paediatric settings. Speedie et al (see page e71) show a tendency towards reduced utilisation and better outcomes for diabetes patients treated in ED settings equipped with EHRs. Zai et al (see page e129) show how operations research can be used to help simulate scenarios for cancer screening to help resource allocation. However, there is also room for improvement. For example, Stultz and Nahata (see page e35) conclude that a CDSS for drug dosing among paediatric patients displays too many inappropriate alerts, a finding also reported by Kirkendall et al (see page e43).

In addition to accuracy, it is important to ensure that clinicians effectively utilise EHRs and CDSS. Saleem et al (see page e147) report on perceived barriers and variations in EHR use among clinicians. Patients also exhibit variation in their use of a portal designed for medication reconciliation, as shown by Heyworth et al (see page e157). Tsopra et al (see page e107) demonstrate how the utilisation of CDSS by physicians increases when a user interface based on their decision processes and usability principles is employed. Cheung et al (see page e63) report on the number and nature of medication incidents that can be attributed to poorly designed information system interfaces. Meeks et al (see page e28) describe how sociotechnical models can help stakeholders understand patient safety risks that can be associated with information technology. Goldwater et al (see page e50) highlight how a flexible open source EHR system was widely adopted in some community health centres. However, EHR utilisation may also be associated with higher clinician stress, as documented by Babbott et al (see page e100). Friedman et al (see page e78) provide a categorisation EHR workarounds employed by primary care practitioners.

EHR utilisation and interoperability are key requirements of health information exchange (HIE) systems. Hopf et al (see page e6) review the perspectives of healthcare professionals on linkage of healthcare data. Goldberg et al (see page e55) report on a CDSS designed to be scalable and interoperable. Interoperability is also critically important for public health, as described in a case report by Phillips et al (see page e173) and in a review by Olsen and Baisch (see page e20). Finally, structuring data in healthcare documents relies heavily on mapping concepts in the EHR to standards. Lee et al (see page e11) review the literature on SNOMED CT, and several authors report on the usefulness of natural language processing and related techniques in structuring data from clinical documents, including Pai et al (see page e2), Xu et al (see page e84), Mayfield et al (see page e122), Perry et al (see page e136), Bellows et al (see page e163), and Leroy and Kauchak (see page e169).

To conclude this journal issue, correspondence by Bernstam et al (see page e178) discusses the pros and cons of promoting separate informatics sub-speciality conferences. Having this discussion is itself a sign that our discipline has reached adequate critical mass and has grown well beyond a small group of generalists. We need to move forward with an eye towards a future in which informatics permeates every aspect of healthcare and biomedical research. I hope this issue of JAMIA motivates our authors and readers to reflect on the exciting road that lies ahead.