

Computer-based safety surveillance and patient-centered health records

doi:10.1136/amiajnl-2011-000673

Lucila Ohno-Machado, *Editor in chief*

There is much debate on which types of computer-based systems have the most impact in healthcare delivery and patient outcomes. Safety surveillance systems, which have been around for several years, are probably at the top of the list. These provider-oriented clinical decision support systems allow healthcare providers to monitor the safety of medications and other interventions that are critical to prevent poor outcomes. However, another rapidly growing type of system related to personal health records (PHR) is likely to be a contender for the top position within the next few years. These ‘consumer’-oriented systems currently have a primary focus on providing information to patients, but soon will follow the evolution of provider-oriented systems to expand into consumer-oriented decision support systems. In this issue of *JAMIA*, we cover safety surveillance systems and patient-centric systems, which nicely complement articles covering the same topics that were published in our extraordinary online issue last December.

Safety surveillance systems

A perspective by Coiera *et al* (*see page 2*) reviews the main developments in safety surveillance in the USA and abroad, highlighting opportune areas that remain uncharted. For example, data from different sources can be used in surveillance systems. Magrabi (*see page 45*) describes how US Food and Drug Administration reports can be used to develop a classification system focused on safety, and Overhage (*see page 54*) validates a data model for safety surveillance research using, among other sources, data from electronic health record (EHR) systems. Li (*see page 6*) reviews the literature on patient safety implications of frequent interruptions in the course of clinician care.

Proper evaluation is essential for studying the efficacy of decision support systems as it relates to safety. Ancker (*see page 61*) describes a framework for evaluating the effect of health information technology on both quality and safety. In a systematic review, Augestad

(*see page 13*) reports the rate of adherence of informatics randomized controlled trials to CONSORT guidelines. Specifically relating to pharmacotherapy, McKibbin (*see page 22*) reviews the effectiveness of several medication management systems, and Forster (*see page 31*) reviews the impact of different adverse drug event detection systems.

In terms of research, Du’s tutorial (*see page 39*) reviews methods for comparing count data, which are frequently used in safety systems, and explains the pitfalls of commonly used methods based on ordinary least squares. Eppenga (*see page 66*) compares the accuracies of different pharmacotherapy clinical decision support systems, and Rodriguez-Gonzalez (*see page 72*) describes medication administration errors resulting from automated prescription and dispensing systems. Tatonetti (*see page 79*) describes a new algorithm to identify drug–drug interactions.

Special populations, such as the elderly, require different drug dosing. Griffey (*see page 86*) reports the results of a real-time decision support system evaluation for this population. Other decision support systems and tools are included in this issue of the journal: Niland (*see page 111*) briefly describes a system to grade adverse events based on laboratory values, Shiffman (*see page 94*) describes a tool for assisting in knowledge capture for computer-based practice guideline systems, and Chiu (*see page 102*) reports on how a detailed pedigree information system can be used to support genetic studies.

Perceptions are key to the adoption of these decision support systems. Usability studies can uncover the reasons why healthcare providers do not exhibit uniform levels of adoption. Goddard (*see page 121*) provides a systematic review of automation biases related to human computer interactions that extend beyond the healthcare field to fields such as the aviation industry.

Patient-centric systems

The internet has transformed the way people access information and how they

connect to each other or to institutions that hold their data. Informatics solutions that engage patients to play a major role in their own care are long overdue. As reported by Beard *et al* (*see page 116*), attempts have been made to make EHRs directly accessible to patients. However, the healthcare sector has historically lagged behind in terms of opening up information to its ‘consumers’, and adoption has been slow, except for certain types of patient portals and PHR systems.

Patient portals are now commonly found in many institutions that have electronic records as major EHR vendors provide this module. Nielsen (*see page 128*) describes factors related to the usage of a portal for multiple sclerosis in which users frequently communicate with their providers about medications and side effects.

In addition to provider-based patient portals, several initiatives to develop PHR controlled by the patients have been created in the past decade. Li (*see page 134*) proposes a standard for travelers’ records that could be used across the globe. Marquard (*see page 137*) presents a case-based evaluation of a PHR system.

As evidenced by this issue’s articles, the healthcare industry is changing rapidly. The increasing adoption of electronic records and decision support systems will likely make healthcare safer and more cost effective, as well as increasingly engage healthcare providers and consumers as major agents of change. *JAMIA* is proud to feature excellent articles on every subspecialty of informatics, and will continue to publish supplementary online issues. Visit us at <http://www.jamia.org> to see the special online-only issues and continue to sign up for our free *JAMIA* Journal Club, featuring presentations by the authors of Editor’s Choice papers. This highly interactive event offers everyone an opportunity to ask questions and learn more about specific domain areas within informatics, directly from the people who are making changes in the way we provide care and perform research.