

## Data and the clinical decision support loop



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Health-related data from individuals are at the “start” and “end” of a continuous clinical decision support loop: these data drive the development of models embedded in decision support systems whose implementation results in outcomes data for those individuals. The outcomes data are further used to improve and develop new predictive models and corresponding decision support systems. In this issue of *JAMIA* we present brief communications and research articles in areas that support the clinical decision support loop: data collection and quality assessment, analysis, predictive modeling in decision support systems, and evaluation of clinical outcomes.

The quality of data collected in the process of care is highly variable and needs to be continuously monitored and improved. Moscow (see page e108) shows that this is particularly true for antibiotic prescriptions. Davhle (see page e99) evaluates the utilization of RxNorm in ambulatory care prescriptions, and Zhou (see page e79) examines food entries in a large allergy repository. Hsu (see page e152) proposes a data-driven approach for quality assessment of radiologic interpretations, while J. Bates (see page e113) classifies radiology reports for falls in an HIV study cohort. Cohen (see page e146) describes the barriers and benefits of meaningful use care coordination criteria among primary care providers. A systematic review by Hodgson (see page e169) describes risks and benefits of speech recognition for clinical documentation. Data integration is helpful in reducing uncertainty and improving phenotype characterization, and Scheurwegs (see page e11) and Denny (see page e20) show the advantages of combining structured and unstructured sources for this purpose. Patrick (see page e42) discusses opportunities and challenges in using personal health data for research.

Data analyses result in predictive models that are employed in different health sciences domains, for example, predictive models embedded in electronic clinical decision support systems. Heatherly (see page e131) reports on a multi-institutional evaluation of clinical profile anonymization. Toerper (see

page e49) reports on a prospective evaluation of a catheterization laboratory inpatient forecast tool, Barnes (see page e2) presents a model that predicts inpatient lengths of stay in real time, and Apley (see page e71) describes an approach to validating sampling for logistic regression models.

Different modalities of alerts and reminders are available through texting, email, and patient or clinician portals; however, patient use of these modalities is variable. McIvers (see page e88) shows that text messages may not be effective in improving rates of hepatitis B vaccinations, while Tesfalul (see page e142) studies the potential impact of mobile technologies on specialty care coordination in a resource-constrained setting. Otte-Trojel (see page e162) does a systematic review of the literature on patient portal development, while Lazard (see page e157) emphasizes the need for design simplicity in these portals. Xu (see page e34) describes a visualization system to navigate educational materials, and Lyles (see page e28) reports on improvements in adherence to medical refills via EHRs across racial and ethnic groups. Chow (see page e58) identifies patient and provider predictors of patient receipt of therapies recommended by a clinical decision support system, and Turley (see page e118) proposes an information model to assess concordance between patient advance care directives and actual delivery of care at the end of life.

Several articles in this issue of *JAMIA* also focus on clinician adherence to clinical decision support. Bauer (see page e125) shows that clinicians' responses to alerts and reminders can be predicted by their familiarity with the topic and experience with the system, and D. Bates (see page e93) studies factors associated with provider response to clinical decision support system warnings. Some alerts and reminders can be disruptive, and hence Hoffman (see page e138) proposes a novel measure for their evaluation.

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