Implementing Renal Impairment and Geriatric Decision Support in Ambulatory e-Prescribing

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Abstract
An advanced decision support system for prescribing to patients with renal impairment and geriatric patients was successfully implemented in an ambulatory electronic medical record (EMR) system.

Introduction
Patients with renal impairment and geriatric patients require special consideration when treated with certain drugs. Some medications are not recommended in these patients while others are given in reduced amounts. The specific recommendations are based on the patient’s age, level of renal impairment and the drug in question. Decision support systems can guide providers in appropriate and safe prescribing for these cohorts of patients. Historically, these decision support systems were developed for inpatient use only, and have been demonstrated to be beneficial.1

Background
Partners Healthcare System has a rich tradition of pioneering work in electronic order management and decision support. Inpatient computerized provider order entry system at the Brigham and Women’s Hospital serves as a good example. In addition to basic e-prescribing decision support, which typically includes such interventions as drug-allergy, drug-drug, and duplicate medication checking, it provides recommendations on drug substitutions as well as dose and frequency adjustments for older patients and patients with various degrees of renal impairment. This advanced decision support system relies on an internally developed knowledge base that drives its recommendations.
On the ambulatory side, Partners employs the Longitudinal Medical Record (LMR) system – a fully featured internally developed EMR. Over 12,000 providers take care of approximately one million patients using LMR. Its e-prescribing module takes advantage of the complete lineup of basic decision support options. This project was successful in implementing the renal impairment and geriatric prescribing decision support system in LMR. The data collection for a study to evaluate its impact in the ambulatory arena is in progress.

Methods
Dose-based Prescribing. Traditionally, a user of e-prescribing software has to choose from a list of available strengths and formulations of a drug, followed by indicating a number of these to take. The actual dose (strength multiplied by “take”) becomes an afterthought. Instead, our users consider the drug dose very early in the prescribing process. Given a dose and knowing available strengths and forms, the system calculates the appropriate number of “takes” automatically. A decision support system whose main intervention method is to recommend an adjustment in dose is easily integrated into such dose-based prescribing workflow.

Content Management. The knowledge base originally developed for inpatient use is at the heart of the ambulatory implementation. A panel of experts undertook a systematic content review using state-of-the-art collaborative tools, ensuring accuracy, completeness, and relevance to ambulatory patients. A process for ongoing content management is being established.

Usability Considerations. A high priority goal was to ensure minimum interruption to provider workflow. When adjusting dose or frequency, the recommendations are automatically calculated and then presented as defaults (with no interruptive alerts). If height and weight records are insufficient, providers are interrupted only if all other information necessary to estimate the creatinine clearance is present.

Conclusion
An advanced decision support system for renal impairment and geriatric prescribing, traditionally reserved for inpatient use, was implemented in the ambulatory arena. Using the existing infrastructure, creating a systematic approach to content management, and designing with usability in mind all contributed strongly to the success of this project.

References