

Electronic Prescribing and Decision Support to Improve Rural Primary Care Quality

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Summary: Poor patient compliance with prescribed medications can adversely affect treatment outcomes. The compliance rate for patients receiving long-term treatment for chronic conditions, such as hypertension, is estimated to be as low as 50 percent. The introduction of electronic prescribing (e-prescribing) systems has the potential to greatly improve the accuracy and efficiency of pharmaceutical treatments. This project examined whether, in rural ambulatory care settings, the use of an e-prescribing system with clinical decision support for medication management increases patient prescription adherence, improves the medication management process, and improves health outcomes in hypertensive patients. As part of its overall Avera HealthCARE™ Initiative, the South Dakota-based health system worked with 28 hospitals and 116 clinics to implement a regional electronic medical record (EMR). The technology package included advanced e-prescribing software, DrFirst Rcopia, that enables physicians to track the fill status of prescribed medications, and provides interaction alerts, formulary listings, dosing options, patient medication history, and printed wallet-size medication lists. The research team examined the impact of the technology on the medication management for patients with hypertension in nine rural or frontier primary care facilities. The project focused on two health information technology (IT) systems: 1) DrFirst Rcopia electronic prescription management system as a stand-alone product; and 2) DrFirst Rcopia integrated within the Meditech/LSS Data Systems Medical EMR and Practice Management Suite, the EMR system being implemented by Avera Health in the ambulatory setting. This EMR includes Zynx Health decision support technology.

The project took advantage of staged implementation, first gathering baseline measures and then tracking clinics that are using e-prescribing as a stand-alone tool before moving to an EMR, and clinics that are moving directly to an EMR with integrated e-prescribing. Medical claims data and the e-prescribing patient-fill histories were used to determine whether patient prescription adherence improved, as measured by blood pressure levels and changes in treatment for patients with blood pressure higher than one hundred forty over ninety. This study was based on the observation of a “natural” process of disseminating and implementing a set of health IT innovations. As such, the experiment can be characterized as a quasi-experimental design with opportunistic, nonrandom assignment of clinics to the experimental condition.

Specific Aims:

- Improve the rate of adherence to prescribed medications among patients with hypertension in rural communities. **(Achieved)**

- Improve adherence to prescribed medications among patients with hypertension through use of e-prescribing tools in rural care settings. **(Achieved)**
- Improve health outcomes for patients with hypertension in rural communities through the use of e-prescribing and associated clinical decision support tools. **(Achieved)**
- Enhance patient and provider satisfaction with the e-prescribing tool. **(Achieved)**
- Overcome barriers to successful adoption of e-prescribing. **(Achieved)**

2011 Activities: A 1-year no-cost extension provided time for the project team to complete data collection activities and the program evaluator and biostatistician to complete the analysis. The team administered the second round of provider satisfaction interviews and patient satisfaction with care surveys. As last self-reported in the AHRQ Research Reporting System, project progress was on track and project budget spending was on target. All activities were completed when the project ended in August 2011.

Impact and Findings: The results did not indicate that the implementation of stand-alone e-prescribing had an effect on the control of hypertension since the proportion of patients with control of blood pressure dropped slightly after implementation. However, after the EMR implementation occurred, there was an increase in the proportion of patients with control of hypertension compared with stand-alone e-prescribing. In addition, the proportion of patients with control of hypertension after EMR implementation was higher than at the baseline, prior to e-prescribing. There were a similar number of prescriptions in both the stand-alone system and after compliance and adherence messaging were added. The first-fill rates in these first two implementations were substantially higher than during the EMR implementation.

The patient survey results were similar across the three study phases. There was a slight downward trend in the level of satisfaction on hypertension treatment after implementation of the stand-alone e-prescribing system and after implementation of the EMR. However, there was an increased level of satisfaction with hypertension medications after both implementations.

A total of 149 educational interventions were recorded for patients with hypertension. A total of 26 patients were identified with hypertension pre- and post-intervention. There did not appear to be a significant effect on blood pressure control, although data on educational interventions and the number of blood pressure readings pre- and post-intervention were limited.

Provider perceptions were more positive when compared to the baseline pre-implementation for both the stand-alone e-prescribing and the EMR implementations. Patient adherence increased, as reflected in the medication possession ratios.

There was a small but consistent pattern across the three study phases, which showed reduced use of brand-name medications and increased use of multisource or generic medications. Changes in medication availability during the time period of the study from additional multisource medication options for prescribers may have influenced the results.

The clinic operating costs trended down for the first three phases, with an increase in cost for phase four during the EMR implementation at most of the clinical sites.

Target Population: Adults, Chronic Care*, Hypertension, Rural Health*

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions and the electronic exchange of health

information to improve quality of care.

Business Goal: Implementation and Use

** This target population is one of AHRQ's priority populations.*