Implementation and Evaluation of Standing Orders Using Health Information Technology

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Organization: Medical University of South Carolina
Contract Number: 290-07-10015-2
Project Period: June 2008 – July 2010
AHRQ Funding Amount: $500,000
Summary Status as of: July 2010, Conclusion of Contract

Target Population: Adults, Chronic Care*, Diabetes

Summary: Preventive health maintenance services (e.g., testing for cholesterol and lipids) can monitor, slow, or halt the progression of chronic diseases such as diabetes. These services also have the potential to reduce related disability and premature deaths. Similarly, vaccinations play a central role in preventing the development of diseases in adults and children. The promotion of health maintenance services and timely, appropriate vaccination is an ongoing focus of the health care system.

Standing orders (SOs) authorize nurses and other appropriate medical staff to provide services in the doctor's office or to order essential services (e.g., bone density scan) that may be provided elsewhere. This project implemented and examined the effectiveness of an electronic SO process to deliver appropriate services at the right time to the right patients. This is done through the use of a health maintenance template within the McKesson Practice Partner Patient Records electronic medical record (EMR), which is certified by the Certification Commission for Health Information Technology. Previous research shows that SOs increase immunizations in practices that do not use EMRs. The potential advantage of reminder systems in practices that do use EMRs may further improve preventive and chronic care measures.

The electronic SOs and the electronic SO quality-of-care measures are based on the screening recommendations of the U.S. Preventive Services Task Force, adult immunization recommendations from the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices, and disease monitoring recommendations for persons with diabetes from the American Diabetes Association.

The lead group for this project is the Practice Partner Research Network (PPRNet), a member-driven practice-based learning and research organization. PPRNet has developed a quality improvement (QI) model called the "PPRNet-TRIP QI model." This model uses a set of core concepts to lead practice development efforts and determine where to focus for practice QI. The research team used the model with participating practices' staff to help with plans to implement SOs.

The outcome measures for this study include:

- Four screening measures (cholesterol, HDL-cholesterol, mammograms, and osteoporosis).
- Six adult immunization measures (tetanus, zoster, and two measures each for influenza and pneumonia).
- Five diabetes measures (HbA1c, urinary microalbumin, HDL-cholesterol, LDL-cholesterol, and triglycerides).

The project used a mixed-methods intervention to study QI. Quantitative data measures were calculated

from quarterly extracts from the EMR and qualitative data were obtained through observation and interviews at practice site visits, network meetings, e-mails, and phone correspondence. The sample included eight PPRNet primary care practices that have between two and 25 providers who had no prior involvement with PPRNet interventions and did not previously use SOs.

Project Objectives:

- Facilitate the initiation of an electronic SO system and its incorporation into daily workflow in eight primary care practices, identifying best methods and strategies. **(Achieved)**
- Determine barriers and facilitators to the uptake and sustained use of electronic SOs in these practices. **(Achieved)**
- Document changes in quality of care indicators and practice time management resulting from the use of electronic SOs. **(Achieved)**
- Disseminate findings to the rest of the research network and publish results in a peer-reviewed medical journal. **(Ongoing)**

2010 Activities: Site visits and network meetings encouraged participation and discussion about the use of SOs, including helpful or difficult aspects, if new related activities are being undertaken, and if they are working. The study team recorded many of the discussions for transcription and qualitative analyses, which were done by constant comparative method to generate new insights into practices' perspectives on implementing the electronic SO system.

The research team used quarterly EMR data extracts to measure the presence of health maintenance templates, use of the templates, and performance on the study measures for each practice. For the final analyses of the 15 quality indicators, the median across practices was calculated at baseline and for each month of the study. Practice-level repeated measures analyses from a mixed-model approach were used to look for significant increases in these measures over time. A manuscript summarizing the SO-TRIP project has been submitted and is under review.

Impact and Findings: Improvements in template presence, template use, and QI performance were found for 14 measures across all practices, demonstrating that the practices applied the health maintenance templates to their EMR system. Practices increased the presentation of reminders at appropriate intervals for each patient. Median improvements ranged from six to 10 percent in screenings, eight to 17 percent in immunizations, and zero to 18 percent in diabetes measures. Larger changes in template presence were noted in testing for HDL-cholesterol, influenza vaccinations for individuals 50-plus years-of-age, and zoster vaccinations for individuals 60-plus years-of-age, indicating that reminders were not commonly used for these patients prior to the project. During the last influenza season, most practices experienced problems receiving an adequate supply of vaccines, which may explain the plateau in the trend noted in the first year.

Qualitative methods were used to determine the barriers and facilitators to the adoption and continued use of a new electronic SO system within each practice. Facilitators included establishing practice protocols, editing and activation of health maintenance templates, use of nursing note templates, and dissemination of patient update forms. Most practices with significant improvement had established policies and protocols and educated staff on the new roles. Staff embraced the project with the support of leaders and did not experience significant time burdens. Technical competence and leadership were cited as important for optimal adaptation and use of EMR reminder tools, help staff adopt new roles, and overcome barriers. Reinforcing the system was critical: successful practices followed up on the project with staff, soliciting staff input, and posting

quarterly performance reports to share successful approaches. Several practices provided trainings conducted by practice physicians to enhance staff knowledge of the system and the implementation of the SO. Many practices took an incremental approach, adopting a restricted set of measures at first and adding others when success was demonstrated. Some practices focused on a limited set of SOs throughout the project and may need more time to demonstrate substantial improvements. Barriers included staff perceptions, limited staff education and followup, EMR technical issues, reimbursement policies for some services, and patient refusal. Two of the eight practices had difficulty incorporating the SO protocol because of larger practice size and diversity (multispecialty and an internal medicine group) of clinicians.

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

Business Goal: Implementation and Use

* *AHRQ Priority Population.*