

The Bettering Lives Utilizing Electronic Systems (BLUES) Project: Improving Diabetes Outcomes in Mississippi with Health Information Technology

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Summary: The Delta Health Alliance (DHA), which has sponsored the Delta Diabetes Project (DDP) over the past several years, initiated the Bettering Lives Utilizing Electronic Systems (BLUES) Project in September 2007 to determine whether utilization of health information technology (IT) in diabetes management would enhance health care delivery and improve patient's health outcomes. This pilot project examined the cost-effectiveness of using well-designed, comprehensive health IT in diabetes management practices at several ambulatory clinics in Mississippi. The research team collected measures related to process and outcomes associated with diabetes, such as those for blood pressure, HbA1c, low-density lipoprotein (LDL) and patient satisfaction. Additionally, the study looked at the impact of health IT on medication management and timeliness of care.

Four diabetes management clinics participated in this study: two in an urban setting and two in a rural setting, each clinic employing the same model of diabetes care. Two clinics implemented an electronic health record (EHR) (one urban, one rural), and two remained paper-based practices (one urban, one rural). Outcome variables were measured at baseline and at 6-month intervals for a period of 2 years, yielding a maximum of five total time points.

Overall, the results in terms of EHR versus non-EHR sites were mixed, although the LDL results were consistent with a positive effect of the EHR. The lessons learned were invaluable in demonstrating that installation of EHRs alone does not improve outcomes for chronic disease; it must include significant clinician training, support, and use of health IT tools such as clinical decision support.

Specific Aims:

- Implement an EHR system in two existing diabetes management clinics, focusing on integration of the EHR into clinician workflows. **(Achieved)**
- Evaluate the impact of the EHR system on clinical processes of care and patient outcomes. **(Achieved)**
- Produce and distribute a generalizable, replicable model of care for implementing an integrated health IT system for diabetes management care throughout the United States. **(Achieved)**

2011 Activities: During the initial data analysis in late 2010 and early 2011, one test clinic continuously demonstrated clinically different outcomes from the others. This difference caused the project team to review the methods used in the original queries to ensure they were the same as in the other test clinic. Upon further review, the team noted that there was a technological problem with one of the servers at the

University of Mississippi Medical Center from which the data was pulled. This resulted in a significant difference in the way the data was pulled between the two test sites. Therefore, activities in 2011 focused on re-running the data and correcting the data issue with this clinic.

The project team used a 12-month no-cost extension to adjust the data collection between comparison sites and complete the project aims. Meanwhile, the team was conducting the background work to prepare for the data analysis and looking at comparative research to inform any potential journal articles that could result from this study. Once the data issue was resolved, data analysis was conducted relatively quickly and manuscript development began. As last self-reported in the AHRQ Research Reporting System, project progress was on track and project budget spending was on target. The project ended in September and the study team delivered a final report to AHRQ in December.

Impact and Findings: This pilot study provided many lessons about the implementation of EHR projects as well as necessary steps for improving health care and health outcomes for diabetes patients. The project revealed some inherent difficulties in collecting data in order to evaluate the impact of obtaining and using an EHR, such as the necessity of a paper chart control group and the large number of missing lab values in the initial EHR data. It is thought that as the EHR system continues to develop, the data generated from it will most likely improve.

Findings in this study indicate that simply deploying EHRs does not improve health care for diabetic patients. However, EHRs coupled with training and appropriate tools can result in improved process-of-care measures (timely and appropriate exams and lab testing, for example), greater patient satisfaction, enhanced diabetes-related outcomes, improved provider satisfaction, better medication management, increased patient safety, and reduced care-related costs. These findings imply that the promotion of best practices for disease management and care coordination in conjunction with the implementation of health IT improve health outcomes for patients.

The data and information collected from this study will be important in designing and securing future programs that are addressing the deficiencies often seen in the Mississippi Delta. Rural clinics need technological literacy and training to implement health IT, including EHRs, and serve a disparate population in a more connected way. Future studies might focus on how to best implement training programs in clinics to speed the process of EHR implementation and clinician training.

Target Population: Adults, Chronic Care*, Diabetes, Medically Underserved, Racial or Ethnic Minorities*

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

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