

Data Flow & Clinical Outcomes in a Perinatal Continuum of Care System

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Organization:	Lehigh Valley Hospital
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Summary: Medical errors are often caused by poor communication, especially during transitions of care between the inpatient and outpatient care settings. For example, test results and clinical notes completed in one setting are often not available in the other, or discharge information and planned followup care are not communicated adequately between providers. These issues are particularly striking for obstetrician gynecologists (OB/GYNs) who care for patients in both settings and frequently have an urgent need for current clinical patient data. One solution to this problem is to interface the ambulatory electronic medical record (EMR) to the inpatient perinatal information system to enable data exchange between the systems. This allows patient data to be available in real time, regardless of the location of the provider or patient. Since few EMR vendors can supply a single solution with a unified database of clinical information for the outpatient OB/GYNs and the inpatient labor and delivery (L&D) triage environments, most organizations utilize separate clinical information systems.

In order to improve data access and completeness at all points in the perinatal continuum of care process, the Lehigh Valley Health Network (LVHN) implemented a vendor-supplied ambulatory EMR system at the three outpatient OB/GYN practice groups that interface with the perinatal information system implemented at the L&D unit of Lehigh Valley Hospital-Cedar Crest, the network's main hospital. The goal is to establish a real-time exchange of patient data between these systems. In theory, patient medical information from all physician offices participating in the integrated EMR system should be available when a patient arrives at the L&D unit, and information from a patient's visits to the L&D unit should be available in ambulatory care settings.

The study team is evaluating the implementation of the integrated EMR system. Quantitative and qualitative data collected during implementation is being used to assess the system's effect on organizational and process change in the outpatient and inpatient settings and the system's ability to deliver accurate, complete, and timely data to providers and clinical staff at points along the perinatal continuum of care. Qualitative data is being collected by administering surveys, conducting interviews, and analyzing notes from meetings that occurred before, during, and after system implementation. The qualitative data will be used to describe the changes in organizational and workflow processes resulting from the integrated system. Quantitative data is being collected from surveys, LVHN databases, and the Pennsylvania Health Care Cost and Containment Council to assess the system's effects on data completeness, medical outcomes, provider efficiency, and patient and provider satisfaction. The evaluation will provide lessons for other organizations attempting to integrate outpatient and inpatient data through health information technology.

It will also provide policymakers with an overall assessment of the costs and benefits of integrating EMR systems.

Specific Aims:

- Develop grounded theory to describe the process of effective implementation and integration of ambulatory EMR systems with hospital information systems through qualitative analysis of technology acceptance and use and complementary organizational and process change. **(Ongoing)**
- Examine quantitatively the change in data completeness (complete and accessible data) at the hospital and the individual practices resulting from the adoption of the integrated EMR system. **(Ongoing)**
- Examine quantitatively improvements in health outcomes, staff perceptions of patient safety, and patient and medical staff satisfaction, as well as changes in the productivity of primary care and inpatient physicians. **(Ongoing)**
- Using mixed methods, triangulate the results of the quantitative and qualitative analyses to gain a deeper understanding of how to achieve benefits from an integrated EMR. **(Upcoming)**

2012 Activities: Data collection activities involving surveying, interviewing, document analysis, and data abstraction continued throughout 2012. Abstracting data from the perinatal information system was challenging because after the project team defined the data needed for this project, they learned that some of it was readily available in the perinatal information system and some of it had been archived. Project staff had to reinstate the archived data manually into the active system in batches and then abstract it from the system. The data is now under review to determine whether it is complete enough for the analysis. This quality review will continue into 2013 followed by analysis. The project team also worked on an initial analysis of patient outcome data.

As last self-reported in the AHRQ Research Reporting System, project progress and activities are mostly on track, and the project budget funds are somewhat underspent because personnel costs were lower than projected for Year 1 of the project. Dr. Levick anticipates that personnel costs will increase during Year 2 as project staff increase time on the analysis component.

Preliminary Impact and Findings: Initial findings support that the availability of specific data elements at the point of care (both in the ambulatory office and in the Triage Unit) may have a positive impact on maternal outcomes. This analysis was performed on a limited dataset; and further analysis is ongoing. Preliminary analysis of the integrated EMR system implementation demonstrates several lessons learned:

- The decision between maximal functionality of systems (best of breed architecture) versus true integration (single platform architecture) is an enterprise strategic decision.
- Understanding the provider workflow is critical to the introduction of new, interfaced data. Managing expectations and standardizing the provider workflow can impact successful adoption.
- Need to find the appropriate balance between the amount of data to interface and “data overload” which reduces usability and acceptance.
- An incremental approach to implementation and interfacing can improve acceptance and integration into provider workflow.
- The balance between the quantity of structured text (improved analytics) versus free text entry

(more efficient provider workflow) is an ongoing challenge.

Target Population: Women*: Pregnancy

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of 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.*