

Improving Patient Access and Patient-Clinician Continuity Through Panel Redesign

Principal Investigator:	Balasubramanian, Hari, M.S., Ph.D.
Organization:	University of Massachusetts Amherst
Mechanism:	PAR: HS08-268: Small Research Grant to Improve Health Care Quality Through Health Information Technology (IT) (R03)
Grant Number:	R03 HS 018795
Project Period:	February 2010 – February 2012
AHRQ Funding Amount:	\$100,000

Summary: Primary care practices in the United States must balance the timeliness of care delivery with continuity. Continuity of care includes balancing the lead time for appointments with the goal of having patients see their own primary physician whenever possible. Timeliness and continuity are intrinsically tied to the makeup of the patient population—the “physician-patient panel”—that a physician oversees. In addition to these priorities, teaching hospitals must take into account the learning requirements of their medical residents. In order to prepare for future practice, residents should be exposed to the widest possible range of clinical experiences.

Using patient appointment data, physician-patient panel sizes, and physician case mix, Dr. Balasubramanian and his team investigated how group practices can manage physician and resident-patient panels to improve timeliness of access and continuity. They developed a quantitative decision-support system to help clinicians, practice managers, and health systems answer the following questions:

- How should physician-patient panel composition be altered over time to best match patient demand with physician supply?
- How should practices best match patient and physician preferences, while simultaneously considering the influence of panel size and case mix on patient access?
- How many additional new patients can be empanelled without adversely affecting the goals of timely access and continuity?

The project team constructed a general modeling framework for managing physician and resident-patient panels in a group practice and utilized systems engineering methods (optimization and discrete event simulation) to model the system over time. By incorporating specific features such as patient and physician preferences, changes in scheduling regimens, and changes in the supply and demand dynamics of a practice, the project team extended the framework’s applicability to various primary care settings.

Specific Aims:

- Develop a modeling framework that can translate generally to various primary care settings. **(Achieved)**
- Extend the model’s ability to dynamically generate optimal panels and incorporate changes in physician availability and patient demand over time. **(Achieved)**
- Develop and disseminate the first two aims in a Web-based decision support tool for clinicians, practice managers, and health care systems. **(Achieved)**

2012 Activities: Retrospective data from primary care clinics were used to complete the development of computer simulation models to optimize physician-patient panels and support operational and capacity planning for clinics. Due to delays initiating the project, Dr. Balasubramanian used a 1-year no-cost extension. This project was completed in February 2012.

Impact and Findings: Two primary care clinics were involved in the study: the Primary Care Internal Medicine Practice at the Mayo Clinic in Rochester, MN, and a primary care clinic at the Massachusetts General Hospital (MGH). Retrospective data from the Mayo clinic was used to determine important attributes in the distribution of patient visits among providers in order to develop the model. At MGH, the focus was on applying the developed model and evaluating the impact of reassignments to optimize panels.

The analysis of the Mayo Clinic practice used data from 2004 to 2006 on 20,000 patients and 39 physicians to characterize the practice and predict the probability of a patient appointment request. Patient-level data included the number and type of chronic conditions afflicting each patient, as well as the number of visits for each patient during the 3-year period. Dr. Balasubramanian and his team developed a simulation model to explore the impact of moving patients between panels as a way to improve timely access and continuity of care. The model showed a 40 percent improvement in timely access and continuity of care when older patients with many chronic conditions were shifted from an overburdened physician to a physician with available capacity.

The analysis of the MGH practice used data from 258 residents and approximately 17,000 patients for the 21-month period between July 1, 2008 and April 30, 2010. Dr. Balasubramanian used data from 14 residents and three preceptors to examine the number of diagnoses per resident panel versus the number of patient visits. This analysis showed a wide variation in number of diagnoses per resident panel and that patients with more diagnoses have more clinic visits. The patient reassignment model was applied within and across preceptor panels. Reassigning patients within a preceptor panel reduced the imbalance and maintained continuity between preceptor and patients. Reassigning patients across preceptor panels further reduced the imbalance; however, it also decreased continuity of care. By applying the model within and across preceptor panels, the difference between number of diagnoses and number of visits was reduced. Not-yet optimized panels were compared with optimized panels at current and with a 10 percent increase in physician demand. The optimally designed panels with the 10 percent increase in demand offered more capacity than the not-yet optimized panels without the increased demand. The models indicated that optimized physician-patient panels increase physician capacity and may create an opportunity to mitigate physician shortages. Dr. Balasubramanian noted that while reassignment of patients across preceptors would have serious ramifications for continuity of care, the model may be applied to assign new patients to physicians and to assign patients to new residents.

In a time where more practices are implementing the patient-centered medical home, this research provides a framework for dynamic management of physician panels in a primary care group practice to improve access and continuity. The process of patient panel redesign can be achieved by practices over many years, based on natural attrition rates and new patients joining the practice. The findings from this study may serve as an assessment tool for practices to characterize and benchmark their clinic population on an ongoing basis and ultimately increase access and continuity of care.

Target Population: General

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: Knowledge Creation
