

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 its 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 its 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 are investigating how group practices can manage physician and resident-patient panels to improve timeliness of access and continuity. They are developing a quantitative decision support system to help clinicians, practice managers, and health systems answer the following questions:

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

In developing the system, 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 will extend the framework’s applicability to various primary care settings. The models will be disseminated through a Web-based decision tool.

Specific Aims:

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

practice managers, and health care systems. **(Ongoing)**

2011 Activities: Retrospective data from primary care clinics were used to develop computer simulation models to optimize physician-patient panels. Visit rate, patient co-morbidities, case mix, physician preferences, and physician capacity were assessed as model inputs. Particular emphasis was placed on the use of physician teams to manage urgent care appointments and maximize continuity of care. In the context of medical resident education, where a heterogeneous physician-patient panel offers greater learning opportunities, Dr. Balasubramanian developed a measure of imbalance of resident panels to determine the mix of diagnoses in each resident's panel. Next, a patient reassignment model was developed and applied to the data to attempt to correct the imbalance in resident panels. Finally, the impact of the patient reassignment model was assessed. The patient reassignment model will be turned into a Web-based decision support tool for use by other practices.

Due to delays initiating the project, Dr. Balasubramanian is using a 1 year no-cost extension. As last self-reported in the AHRQ Research Reporting System, project progress and activities are mostly on track and the project budget is roughly on target.

Preliminary Impact and Findings: Encounter data from a primary care clinic at the Massachusetts General Hospital were characterized for a 21-month period, July 1, 2008 to April 30, 2010. The data indicated that the practice consisted of 258 residents and approximately 17,000 patients. Using data from 14 residents and three preceptors, Dr. Balasubramanian examined 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 both within and across preceptor panels. Reassigning patients within a preceptor panel reduced the imbalance and maintained continuity between the 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 physician demand 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 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 as well assign patients to new residents.

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
