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Online Supplementary Material

Day J, Scammon DL, Kim J, et al. Quality, satisfaction, and financial efficiency associated with elements of primary care practice transformation: preliminary findings. *Ann Fam Med*. 2013;11(Suppl 1):S50-S59.

http://www.annfammed.org/content/11/Suppl_1/S50.

Supplemental Appendix 1. Contextual Factors Relevant for Understanding and Transporting Findings From This Study

Stakeholders

- Public policy parties
  - Payers (including coverage by University Health Plan)
  - Structure of public health insurance (eg, benefit packages, extent of capitation under Medicaid)
  - Data infrastructure (eg, state-funded All Payers Claims Database, Utah Population Database)
  - State practice laws (eg, prescribing authority of physician assistants, nurse practitioners)
- Community
  - Sociodemographic and economic profile of clinics' local communities (eg, poverty concentration, minority composition)
  - Built environment surrounding individual clinics including transportation networks
- Population characteristics
  - Health status
  - Age, race/ethnicity
- Health care system
  - Structure of health care system, hospitals, ambulatory care clinics
  - University Healthcare executive leadership
  - Community Clinics senior leadership
- Practice (see Environmental Factors for details)
  - Clinic medical directors and managers (management style, commitment to redesign)
  - Clinicians (individual characteristics such as specialty, predispositions/attitudes)
  - Medical assistants (training and experience)
  - Practice characteristics
- Research team composition
  - Insiders (Community Clinics personnel)
  - Outsiders (multidisciplinary academics, research associates)

Environmental Factors

- Clinics (size, layout, proximity to headquarters, market environment, culture)
- Employee mix/flux (percent residents, percent academic staff, percent part-time employees, MD-MA ratio, employee turnover, presence of specialists, relationship of clinics to University of Utah Hospital)
- Management mix/flux (turnover, structure of management team, structure of care teams)
- Productivity level (patient panel size, number of visits per year, patient health status [percent with chronic conditions and multiple chronic conditions])

How did the multilevel interaction among these factors affect the interpretation of the findings (internal validity) and their transportability (external validity)?

Assessment	Context for Interpreting Internal Validity	Context for Interpreting External Validity
Public policy	The Community Clinics had a fee-for-service payment arrangement; there were no increased payments for enhanced services; practices had to make a positive "bottom line"; there was distribution of Community Clinics patients among insurance plans, including Medicaid and the University Health Plan.	Consider payers and payment structure. Consider unique structure of public health insurance Medicaid benefit package and extent of capitated payment; Medicare Advantage coverage. Consider state practice laws (see above).
Community	Utah has low representation of ethnic minorities, but its Hispanic population is growing rapidly. It has a relatively healthy population compared with other states, and a high percentage of pediatric and geriatric patients. These factors underscored the need to control for health status, age, ethnicity/race in analyses. Each clinic had a unique sociodemographic and economic profile. There was influence of the built environment surrounding each clinic, including transportation network, housing density, clinics owned by competition.	Health care industry is highly concentrated at the system level with 4 major hospital systems: Intermountain Health Care (nonprofit, controls about half the market), University Healthcare (academic medical center), MountainStar (for-profit), and Iasis (for profit). Preponderance of primary care clinicians work in small practices. Unique sociodemographic and economic profiles and built environments of individual clinics.
University of Utah Health Care	After a business turn-around, Community Clinics were able to engage in practice redesign semiautonomously from the rest of University of Utah Health Care. Experimentation and risk taking were allowed and encouraged.	Community Clinics are fully owned by University of Utah Health Care. Operating margins are absorbed by parent organization.
Practice	The 10 clinics varied in physical size, patient panel size, clinician composition, geographic location, and management structure. These variables were used for controls in our analyses. S The sample of 10 clinics does not provide adequate statistical power to address some research questions. Much of the available data were gathered for operational purposes and may not have the rigor of widely used and validated measures.	Consider the affiliation of practices with parent and variation across practices.
Research team	The interdisciplinary team included Community Clinics employees, academics from multiple disciplines (medicine, economics, biostatistics, business), research associates (MPH/MHA/PhD). The research team evolved from multidisciplinary to transdisciplinary over course of project.	Recognize strengths of the interdisciplinary team; team has capacity to do variety of analyses and reach diverse audiences with publications.

Note: The following factors changed in important ways over the course of the study:

- Initial implementation took place after a financial turn-around by Community Clinics. With the financial pressure reduced, clinics could turn their time and energy to practice redesign. Roll-out took place in stages, allowing for relative emphasis on 1 area of change (eg, access) at a time for training, implementation, and adaptation.
- Senior leadership's attention was often drawn to urgent issues and away from Care by Design (CBD) implementation. This distraction may have given opportunity for more local adaptation of CBD elements, but also potentially less aggressive implementation.
- Periodic all-clinics training meetings were started. These meetings allowed for renewed commitment to CBD and refinement of the model (eg, from "this is CBD" to "what are the 'must-haves'?").
- Monthly meetings of all clinic medical directors, administrators, and system senior leadership facilitated sharing of best practices.

The following people worked together to identify the relevant contextual factors and to consider how they might have affected the internal and external validity of the study:

- Principal investigator (Michael Magill)
- Coinvestigators (Julie Day, Debra Scammon, Norman Waitzman, Jaewhan Kim)
- Community Clinics Quality Medical Director (Julie Day)
- Community Clinics Quality Manager (Annie Sheets-Mervis)
- Community Clinics Senior Leadership Team including Chief Operating Officer and Medical Director
- Research Associates (Andrada Tomoaia-Cotisel, Rachel Day)

Context Matters Reflection

Care by Design™ (CBD) was implemented after a financial turn-around by Community Clinics. After overcoming the financial crisis, the clinics were able to turn their time and energy to practice redesign.

CBD was developed and rolled out in stages: appropriate access, care teams, and planned care. It was developed at senior leadership strategic planning sessions that considered the current system and changes needed, followed by implementation, review, and demonstration at a pilot site. Each time a new element of the model was rolled out, a systemwide meeting was held to provide the vision and training necessary to go forward as well as to provide best practices in what had already been implemented. Although the format of these meetings changed over the years, the meetings were key to creating the unified vision of CBD and the common understanding of the "must haves" vs appropriate places for flexibility/adaptation. We think such specific tailoring and periodic review will be useful for other health systems developing and implementing redesign.

At various stages during the implementation, senior leadership relied on performance data to identify successes as well as opportunities for improvement. Team and clinic performance data were provided at the biannual all-employee meetings. Clinic managers and medical directors shared individual clinic performance data in monthly Community Clinic Council meetings. Common data were shared with regard to quality (process and health status, and clinician, staff, and patient satisfaction), productivity, financials, and extent of implementation of CBD.

The clinics' leadership periodically directed their attention to demands that competed with CBD implementation, such as designing and opening new services and facilities. This situation may have allowed more variability in CBD implementation by individual teams and sites.

Although the Community Clinics are part of the larger University of Utah Health Care organization, they are diverse, resulting in adaptations as well as different levels of fidelity to CBD implementation. In terms of research insights, these differences provide a rich basis for investigating "why" and "how" adaptations and differences in pace of change occurred.

We were in the advantageous position of both implementing and studying change in the clinics; however, our research has been handicapped by the fact that much of the data we used were created for operational purposes. Our measure of extent of implementation is an internally developed tool with limited reliability and validity testing. With data from only 10 clinics, our study did not have sufficient statistical power for some potential research questions of interest.

This redesign was implemented within a fee-for-service payment model. Clinicians are paid based on clinical productivity only, without financial incentive for outcomes such as clinical quality and patient satisfaction. Management and medical assistants are salaried.

University of Utah Health Care is an academic medical center combining multiple hospitals, specialty clinics, and primary care clinics. Community Clinics are a network of 10 community-based clinics that are fully owned by University of Utah Health Care.

Our research team is interdisciplinary, drawing expertise from schools across the university campus. The team's competencies and roles highlight the characteristics to be considered when studying any redesign effort.