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Online Supplementary Material

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Supplemental Appendix. Additional Details on Study Methods

This appendix provides supplemental descriptions of the methods used in the case study component of the A-TRIP (Accelerating the Translation of Research into Practice) study. The goal was to understand the approach to improvement in a set of practices that, at 1.5 years into the 3-year intervention period, adhered to the most guidelines in individual patients.

Sampling

Practice selection was based on all primary care practices enrolled in the A-TRIP project as of January and April 2005. These dates represented the reporting period for the first 2 quarters after the intervention midpoint. Practices were officially enrolled in A-TRIP once they submitted an extract of their electronic medical record (EMR) data, and they remained enrolled as long as they continued to send quarterly data. In January 2005 there were 87 active practices, and in April 2005 there were 96. The 10 practices that showed the greatest adherence to clinical guidelines as indicated by scores on a Summary Quality Index (the SQUID) at each point in time were selected for further study.

The SQUID is a composite quality score available at the patient and practice level. The practice-level SQUID was used in this study to identify high-performing practices. The SQUID is the average percentage of adherence to all applicable A-TRIP clinical guideline indicators among adult patients eligible for at least 1 of the indicators.[1] The measure includes 31 process and 5 outcome indicators representing guidelines for heart disease and stroke, diabetes mellitus, cancer screening, adult immunizations, respiratory disease and infectious disease, mental health and substance abuse, obesity, and medication prescribing in the elderly. The inclusion of patient outcomes, such as blood pressure control, and automated data collection from EMR extracts distinguishes the SQUID from well-known summary indices in the research literature.[2]

Selection resulted in a combined pool of 11 practices. Three practices were individual offices from the same medical group located in a single building. These practices were combined for analysis, yielding 9 case practices for study. The case practices represented a range of sizes (1 to 9 clinicians), specialties (family and internal medicine), and locations. We did not state our intent to develop case studies until we were at the stage of confirming our findings. When the study report was presented for validation, all 9 practices agreed to be included.

Practices that had been in the study longer and had more time to organize data entry in the EMR and make clinical improvements had a greater chance at selection than newer practices just starting to work on guideline adherence. Practices joining after April 2005 were automatically ineligible for consideration as a case in this study. To mitigate this bias, we verified over time that the selected cases remained top performers.

Four practices that joined the network after April 2005 extracted retrospective data covering the April 2005 report period. When analyses were run comparing case practices with other practices in the network, these additional practices were included in the comparison group.

Data Collection

Every available source of data from the A-TRIP project was reviewed, and pertinent information was extracted for case analyses. Three major types of data were included: EMR extracts, model adoption ratings, and qualitative information.

EMR Extracts

Quarterly extracts of the EMR (including visit titles, prescriptions, laboratory results, and problem lists) that constituted a limited data set were sent to the Practice Partner Research Network (PPRNet) research offices for cleaning and analysis. These data were analyzed quarterly to provide information about practice performance on individual clinical indicators as well as summary indices.

Model Adoption Ratings

Representatives of each practice were asked to complete surveys in July 2004 and July 2006. These surveys asked respondents to rate their implementation of strategies from the PPRNet TRIP (Translation of Research into Practice) improvement model. Data were available for 45 practices for the July 2004 survey and for 84 practices for the July 2006 survey. Data from both surveys were available for all case practices. Additionally, for the 64 practices that participated in site visits, site visitors discussed and observed the uptake of model items with the practice and used a structured site visit report form to rate whether these model items were in place. Site visit reports are available for 7 of the 9 cases (2 did not participate in site visits). The first survey and the site visit ratings were used to estimate model adoption in case practices. Data from the second survey were used to test and confirm assumptions after archetypes were developed.

Qualitative Data

Qualitative information about each case practice was gleaned from multiple sources. One author (C.F.) read through all project documents and data and captured any segment of text that concerned the case practices. These text files were imported into NVIVO 2.0 (a qualitative analysis software package from QSR International, Australia). Data included open-ended comments made by clinicians and staff in each practice on site visit evaluations, site visitors' observations, and impressions noted in open-ended fields on the site visitors' structured site visit report form; e-mail follow-up between researchers and the practice; listserv messages posted by practice physicians and staff; best practice presentations made by case practice study sites at the project's annual meetings; notes from key informant interviews with members of the case practice study sites; and Internet searches for information about the practices and their communities. Open-ended fields in the site visit evaluation asked respondents to name one thing they learned and to offer suggestions for site visits at the practice. Open-ended fields in the site visitors' structured report form asked the site visitor to record observations about adoption of strategies in the PPRNet TRIP improvement model and to (1) describe anything that should be considered as a new item in the improvement model, (2) describe best practice examples provided by this practice, (3) describe any concerns voiced by the practice concerning the project, (4) describe any concerns the site visitor has about the practice, and (5) identify the practice's planned activities and the focus of the next site visit, including projected time frame. Best practice presentations at the annual network meetings described details of the practices' approach to quality improvement and typically provided examples connecting adopted strategies to changes in indicators measuring guideline adherence.

Data Analysis

The PPRNet TRIP improvement model served as the conceptual framework to guide data analysis.[3] Model adoption was analyzed by individual strategy and by category. For illustration, a strategy is "the practice shares feedback reports with staff." This strategy is part of the "involve all staff" category. The number of strategies adopted by each case practice in each category was used to rank quantitatively the case practice's approach in case-ordered matrices. The use of individual strategies was compared as part of the qualitative case comparison analysis.

Qualitative data were coded and sorted into the categories in the Supplemental Appendix, Table 1. The coded items were reviewed within each category, and items were recoded, as needed, to ensure that each category addressed a unique and cohesive area. The data were exported for each practice and written up as individual case summaries according to a structured template. The case summaries were reviewed using an immersion approach by the primary author and 2 site visitors (L.N., A.W.). Interpretations were discussed, and additional input from the case practices was sought, where necessary.

Iterative cross-case comparisons were conducted (by C.F.). The case-ordered matrices of model adoption were considered in light of qualitative themes identified among sets of cases. Sample themes were "physician posts EMR solutions for others on listserv" and "practice devotes time outside of site visits to group planning of improvements." Case practices were sorted according to these themes until patterns supported 3 case types. The research team reviewed the findings related to case types and discussed alternative hypotheses. Case practices were presented a summary of the findings, and the practices confirmed impressions or provided additional information. Assignment to specific archetypes and features of archetypes were once again evaluated and finalized.

Selecting Archetype Names

After initial brainstorming through e-mail, which involved dictionary and thesaurus references (C.F., L.N., P.N.), coauthors (C.F., P.N., A.W., R.J., L.R.) discussed and fixed names to each archetype. Technophiles are defined in dictionaries as people who are comfortable with, and adapt readily to, new technology or computerization. This definition fit the practices in archetype 1. Teams are defined as people organized to function cooperatively as a group. This description fit our second archetype as well as other practices. Because the term *team* does not quite capture the distinguishing enthusiasm and buy-in among members of archetype 2 practices, we added the descriptor "motivated" to represent this emotive element, resulting in Motivated Team. Enterprise has many definitions, among them a highly motivated industry, a company organized for growth, and readiness to put effort into new activities. Motivation, experimentation, and organization fit this archetype, as does the business orientation of the definitions; however, definitions miss the patient-oriented focus on high-quality care that also defines these practices. Consequently, we devised the name Care Enterprise to recapture this aspect.

References

1. Nietert PJ, Wessell A, Jenkins RG, et al. Developing a summary measure for multiple quality indicators in primary care: the Summary Quality Index (SQUID). Paper presented at the 33rd North American Primary Care Research Group Annual Meeting; October, 2005; Quebec, Canada.
2. McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med.* 2003;348(26):2635-2645.
3. Feifer C, Ornstein SM. Strategies for increasing adherence to clinical guidelines and improving patient outcomes in small primary care practices. *Jt Comm J Qual & Safety*.2004;30(8):432-441.

Supplemental Appendix, Table 1. Coding Categories for Cross-Case Comparisons

Practice Context	Practice Descriptors	Adoption of PPRNet TRIP Improvement Model
Local health system	History, structure, type of practice	Practice values
Community	Investment in improvement	Power and leadership
Patient descriptions	Barriers to improvement	Efforts to engage staff
	Participation in A-TRIP interventions	Redesigning delivery systems
	Postings on project listserv	Activating patients
	Approach to new issues	Utilizing EMR tool use
	Descriptions of staff	
	Sustaining improvement efforts	
	Turnover in practice personnel	

PPRNet = Practice Partner Research Network; TRIP = Translation of Research into Practice; EMR = electronic medical record.