



Preparing the Personal Physician for Practice (P⁴): Site-Specific Innovations, Hypotheses, and Measures at Baseline

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BACKGROUND AND OBJECTIVES: This study's purpose was to describe the innovations, hypotheses being tested, and measures used in residency training redesign in 14 family medicine residencies associated with the P⁴ project.

METHODS: We conducted a content analysis of site visit reports to identify and categorize the curricular innovations that are part of the P⁴ Project. Similarly, we cataloged specific hypotheses to be tested and both site-specific measures and core measures collected by the evaluation team to assess hypotheses.

RESULTS: Selected P⁴ programs include three university-based programs; three community-based, university-administered programs, and eight community-based, university-affiliated programs. These 14 programs had 24 continuity clinics, and 334 residents were enrolled in the baseline cohort (2006–2007). Between two and five innovations were proposed by programs in the baseline period linked to 70 planned hypotheses, with a range of three to seven hypotheses (mean of 4.5). Seven programs (50%) focused on Patient-centered Medical Home practice redesign, and seven (50%) assessed different aspects of a 4-year curriculum as the two most common innovations. Team-based care and team training were tested in six programs, and five tested an individualized curriculum tailored to each resident. Eight programs submitted 11 grants, and six programs were successful in obtaining funding to support P⁴ activities. The sources of funding primarily included the Health Resources and Services Administration, US Department of Health and Human Services, and local foundations, and the mean number of dollars attained was \$659,528 (range=\$50,000–\$2,500,000). Seven grants were received through local sources, totaling \$3,219,884 with an average of \$459,983 per program.

CONCLUSIONS: The P⁴ project had a successful launch and to date has retained all 14 programs that started in 2007. Though no direct funding was provided by P⁴ to individual sites, all have focused on important contemporary challenges for training excellent family physicians, all are engaged in important evaluations, and nearly half have successfully obtained project funding to support their specific P⁴ activities during the baseline period.

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Health care reform, especially in primary care practice, is well underway as part of the movement to establish the Patient-centered Medical Home (PCMH). These reforms are based on nearly a century of research about the beneficial effects of primary care, which confirms its foundational role in sustainable, high-performance health care systems.¹⁻⁷ Features of the PCMH are described in detail elsewhere⁸ and include (1) each patient having an ongoing relationship with a personal physician trained to provide first contact, (2) continuous comprehensive whole-person care, (3) care provided by teams of individuals, (4) patients and their families directly engaged in their own care planning, (5) care is facilitated by information technology, (6) information exchanges about health and health care according to patient need, (7) quality and patient safety and use of evidence-based medicine and clinical decision support tools, and (8) payment reform that recognizes the added value provided to PCMH patients.

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Understanding how best to train residents to attain skills needed to provide care in PCMH models is still unknown, though each of the primary care disciplines is pursuing training innovations.⁹⁻¹¹ In family medicine, the initiative is titled Preparing the Personal Physician for Practice (P⁴).⁹ Briefly, P⁴ is a comparative case study of 14 residencies that are experimenting with changes in the content, location, sequencing, and length of residency education, many of which include aspects of the PCMH. P⁴ began in 2007 and will conclude in 2012. It is cosponsored by the American Board of Family Medicine and the Association of Family Medicine Residency Directors and is administered by TransforMED, a practice redesign subsidiary of the American Academy of Family Physicians.⁹ Here we describe early P⁴ experience, specifically the innovations and hypotheses being tested, as well as measures used in residency training redesign that emerged as the P⁴ project was implemented.

Methods

P⁴ Selection Process

The Association of Family Medicine Residency Directors (AFMRD) and the American Board of Family Medicine (ABFM) united to organize a selection and implementation process for P⁴, which was overseen by a steering committee, cochaired by authors SEJ and LAG. The Steering Committee, composed of leaders from within family medicine, decided on a national comparative case study design of best ideas from the field to study changes in family medicine residencies to prepare new family physicians for the emerging new models of practice. All 460 family medicine residencies were invited to apply, and 84 (18.7%) did, despite the fact that no funding was offered to participants. The absence of funding was deliberate, as seeking practical innovations under existing local conditions was vital to the natural observational design of

the study. Further, it was not feasible in 2006 to obtain funding for all selected family medicine residency programs. From these applicants, 44 were invited to develop detailed proposals, and 40 did so. Fourteen of these (35%) were selected and organized into a diverse set of experiments.

The Evaluation Center

Briefly, each program agreed to evaluate their hypotheses using locally selected measures and implementation schedules. They also agreed to participate in an overarching mixed-methods evaluation using standardized core measures that would be administered to each program annually. The core measures included surveys of the residency program, the continuity clinic sites, and residents. Lastly, the P⁴ evaluation core launched an online diary system to collect qualitative data on aspects of and experiences with implementing change. Core measures were developed and pilot tested with programs, continuity clinics, and residents at the University of Washington and the Oregon Health & Science University (OHSU), who are not involved in the P⁴ program.

Importantly, the ABFM authorized P⁴ programs to proceed with their proposal as long as the programs fully participated in the evaluation. Also, the Family Medicine Residency Review Committee (RRC) was apprised of all P⁴ program activities on a regular basis. Several P⁴ residency programs submitted and received innovation request considerations during the study period.

Site Visits

During the first 14 months of the study, site visits were made to 13 of the 14 programs to review their planned innovations and hypotheses and to determine the specific measures to be implemented, along with precise time intervals for measurement. The visit to the 14th program was delayed until October 2009 due to a flood at one of the program's

continuity clinics. The site visit schedule was developed by asking each program if they would prefer to be visited at the beginning, the middle, or toward the end of the first year. The site visits involved detailed review and revision of innovation approaches and evaluation activities based on the realities of available resources and expertise. Revisions included clarifying hypotheses toward measurable outcomes, changing study measures or changing the measurement implementation plan to ensure capture of data when the effects of the innovations would most likely be evident. Consistent with the observational case series design, each program served as its own control, and historical cohort comparisons were used to determine differences over time. Telephone follow-up is conducted at regular intervals (typically 6 months) with each program to gather information on how the innovation implementation and measurement processes are proceeding and updating any changes made to the plan.

National Meetings

Representatives from each of the 14 programs convened at two meetings in the first 2 years of the program, along with members of the Steering Committee and Administrative and Evaluation Center teams. These meetings provided opportunities to share each program's innovations, their findings to date, and collaborative potential with each other. Common measurements and variables were refined at the first meeting, and progress with respect to these data were presented and discussed at the second meeting.

Content Analysis

We conducted a content analysis of site visit reports using classical methods,¹² which focused on abstracting descriptions of the innovations to be implemented, the hypotheses to be tested, the measures for assessment, and the intervals with which each measure

would be implemented. We also extracted information on funding sources that assisted with implementing and evaluating the P⁴ project. This process is descriptive rather

than evaluative and is how data are presented along with a summary of insights gained from our review of presented material. A consensus process was used between two authors

(PAC and MPE) to create the summary tables. The site visits were completed by study month 15, and site visit reports were abstracted between March and June of 2010.

Table 1: P⁴ Residency Sites, Program Type, Continuity Clinics, and Residents in the Baseline Year

Residency Program	Program Type	# of Continuity Clinics 2006–2007	# of Residents 2006–2007
Baylor HCHD Family Medicine Residency Program, Houston, TX	University based, urban setting	1	16
Cedar Rapids Medical Education Foundation, Cedar Rapids, IA	Community based, university affiliated, suburban setting	1	19
Christiana Care Health System Family Medicine Residency Program, Wilmington, DE	Community based, university affiliated, suburban setting	1	21
Hendersonville Family Practice Residency Program, Hendersonville, NC	Community based, university affiliated, rural setting	4	9
John Peter Smith Hospital Family Medicine Residency Program, Fort Worth, TX	Community based, university affiliated, urban setting	2	65
Lehigh Valley Family Medicine Program, Allentown, PA	Community based, university affiliated, suburban setting	1	21
Loma Linda Family Medicine Residency, Loma Linda, CA	Community based, university administered, suburban setting	1	22
Middlesex Hospital Family Medicine Residency Program, Middletown, CT	Community based, university affiliated, suburban setting	3	24
Tufts University Family Medicine Residency, Malden, MA	Community based, university affiliated, urban setting	1	24
University of Colorado Family Medicine Residency, Denver, CO	University based, urban setting	2	19
University of Missouri Family Medicine Residency, Columbia, MO	University based, suburban setting	3	35
University of Rochester Family Medicine Residency Program, Rochester, NY	Community based, university administered, urban setting	2	30
Waukesha Family Medicine Residency Program, Waukesha, WI	Community based, university affiliated, rural setting	1	17
West Virginia University Rural Family Medicine Program, Harpers Ferry, WV	Community based, university administered, rural setting	1	12
Totals		24	334

Results

The selected P⁴ programs include three university-based programs, two of which are in urban settings and one in a suburban setting; three that are community based, university administered, of which one each is in urban, suburban, and rural settings; and eight that are community based, university affiliated. Of these, two are in urban settings, four in suburban settings and two in rural settings (Table 1). Twenty-four continuity clinics are associated with the project, and 334 residents are in the baseline cohort (2006–2007).

Table 2 summarizes the innovation areas across all programs at baseline. Most programs implemented more than one curricular change,

with seven (50%) focused on PCMH practice redesign, and seven (50%) assessed different aspects of a 4-year curriculum, as the two most common innovations. Team-based care and team training were being tested in six programs at baseline, and five were testing an individualized curriculum tailored to each resident. Less frequent areas of focus (<4) included testing a longitudinal curriculum, resequencing of curriculum, reduced inpatient and expanded continuity clinic rotations, small-group or problem-based learning, and the use of patient-centered care. The least frequent areas of innovation testing were use of learner portfolios, including a community or population

health focus and using community practices as training sites.

Between two and six innovations were proposed by each program in the baseline period (Table 3) linked to a total of 63 planned hypotheses. Between three and seven hypotheses (mean of 4.5) were being tested at each site. A variety of measures were planned to assess the innovations (Table 3), and the implementation of measures, in general, occur from one to four times per year. Details for each programs' implemented innovations, hypotheses being tested, and study measures are included in Appendix 1, available at <http://www.stfm.org/fmhub/fm2011/July/AppendixCarney.pdf>. Eight programs submitted a total of 11 grants

Table 2: Summaries of Innovation Areas, Numbers of Programs With Foci and Expected Numbers of Residents Exposed to Area Over 5-year Study Period

Innovation Area	Number of Programs With this Area	Total Number of Residents Exposed to This Focus	P ⁴ Programs
PCMH practice redesign	8	364	Baylor, Cedar Rapids, Colorado, Hendersonville, Middlesex, Missouri, Rochester, West Virginia Rural
4-year curriculum	7	410	Baylor, JPS, Loma Linda, Middlesex, Missouri, Waukesha, West Virginia Rural
Team-based care and training in teams	6	237	Baylor, Cedar Rapids, Hendersonville, Lehigh Valley, Middlesex, Rochester
Individualized curriculum "intentional diversification"	5	297	Christiana, John Peter Smith, Lehigh Valley, Tufts-CHA, Waukesha
Chronic disease management	5	218	Baylor, Cedar Rapids, Middlesex, Missouri, West Virginia Rural
Longitudinal curriculum	4	175	Colorado, Middlesex, Tufts-CHA, Waukesha
Resequencing of curriculum	4	166	Baylor, Cedar Rapids, Colorado, Lehigh Valley
Less inpatient time and more continuity clinic time (especially PGY-1)	4	184	Baylor, Christiana, Lehigh Valley, Missouri
Small-group learning labs/problem-based learning	4	165	Christiana, Hendersonville, Lehigh Valley, Missouri
Patient-centered care	4	195	Lehigh Valley, Loma Linda, Missouri, West Virginia Rural
Learner portfolios	3	125	Lehigh Valley, Tufts-CHA, Waukesha
Community/population health focus	3	128	Colorado, Hendersonville, Loma Linda
Community practices as training sites	2	57	Hendersonville, Lehigh Valley

Table 3: Summary of Innovations, Hypotheses Being Tested, and Study Measure

Innovation Area	Number of Hypotheses Being Tested (n=65 [†])	Composition of Study Measures
PCMH practice redesign/patient-centered care	14 (21.5%)	EHR (for care delivery and patient outcomes), Leadership Surveys, P ⁴ Graduate Survey, Patient Global Wellness Survey, Patient Satisfaction Surveys, Employee Satisfaction Surveys, resident and other key informant interviews, Practice Environment Checklist, Patient Centeredness Surveys
4-year curriculum	25 (38.5%)	Match results, resident satisfaction surveys, P ⁴ Graduate Survey, Family Medicine Identity Survey, Confidence Survey, resident and other key informant interviews
Team-based care and training in teams	5 (7.7%)	EHR (for care delivery and patient outcomes), employee satisfaction surveys, In Training Exam scores, P ⁴ Graduate Survey, team development measure
Individualized curriculum/intentional diversification	6 (9.2%)	In Training Exam scores, P ⁴ Graduate Survey, Match data, measures of resident competence (eg, clinical skills exam)
Chronic disease management	5 (7.7%)	NCQA measures, EHR (for care delivery and patient outcomes), In Training Exam scores
Longitudinal or resequencing of curriculum	3 (4.6%)	In Training Exam scores, P ⁴ Graduate Survey, focus groups
Less inpatient time and more Continuity Clinic time (especially PGY-1)	3 (4.6%)	In Training Exam scores, P ⁴ Graduate Survey, Family Medicine Identify Survey, resident satisfaction surveys
Small-group learning labs/problem-based learning	1 (1.5%)	Resident and other key informant interviews, resident satisfaction surveys
Learner portfolios	2 (3.1%)	Career development surveys, qualitative evaluation of portfolio content
Community/population health focus	1 (1.5%)	P ⁴ Graduate Survey (for practice setting and career choice)

EHR—electronic health record

NCQA—National Committee for Quality Assurance

[†]5 other hypotheses were associated with patient safety, patient satisfaction and faculty morale and satisfaction.

to support P⁴ activities, including implementing innovations and on-site evaluation, and six programs were successful in obtaining funding during the baseline period (Table 4). The sources of funding primarily included HRSA and local foundations, and the mean number of dollars attained was \$659,528 (SD=\$128,58, range=\$50,000–\$2,500,000). Seven grants were received through local sources totaling \$3,219,884 with an average of \$459,983 per program.

Discussion

Findings from this assessment of P⁴ at baseline are important for several reasons. First, the selection process used for this project, which relied on the creativity and best thinking from residency programs, was successful and resulted in broad representation of family medicine residency programs, and the distribution of selected programs covered most regions around the United States. Second, the innovations proposed by the programs represent transformative changes and are not just

minor modifications. The innovators have heeded the call of the Future of Family Medicine Project to “actively experiment” and have created experiments with the potential to supplant our well developed but potentially obsolete model of residency education.¹³

The innovations being tested are crucial for the discipline and our health care system. Adding an additional year to residency training either by reaching back into the fourth year of medical education or by adding a year onto the end of a

Table 4a: Funding Applied for and Received by P⁴ Programs to Support Study Activities at Baseline

Program	Submitted Grants	Funding Source	Amount Requested	Grants Funded
Baylor	No			
Cedar Rapids	No			
Christiana	Yes	HRSA Title VII (3 year)	\$528,827	No
		Christiana Internal Grant System (one time)	\$74,750	Yes
Colorado	Yes	HRSA Title VII (3 year)	\$601,991	Yes
Hendersonville	Yes	North Carolina Office of Rural Health	\$50,000	Yes
John Peter Smith	No			
Lehigh Valley	Yes	Dorothy Rider Pool Trust (5 years)	\$2,500,000	Yes
Loma Linda	Yes	HRSA Title VII (3 year)	\$230,000	Yes
		Song Brown Program	\$51,000	Yes
Middlesex	Yes	Donahugh Foundation	\$200,000	No
Missouri	Yes	HRSA Title VII (3 year)	\$1,108,955	Yes
Rochester	Yes	State of NY Medical Society	\$97,500	No
		Greater Rochester Health Foundation	\$219,634	No
Tufts	No			
Waukesha	No			
West Virginia University-Rural	No			

Table 4b: Summary of Funding Activities at Baseline

Characteristics	Results
Total number of programs that applied	8 (57.1%)
Total number of grants applied for	11
Number of grants awarded (of those applied for)	7 (63.6%)
Average amount of funding received/program (SD*)	\$659,528 (\$128,584)
Range	\$50,000–\$2,500,000

SD—standard deviation

3-year program is a significant undertaking. There is increasing debate about changing the length of training in family medicine and the P⁴ experimentation around this issue is vital to the discussion.¹⁴⁻¹⁶ Creating longitudinal clinical experiences

rather than the traditional block design required extensive rescheduling of both resident and faculty time and included important negotiations with other disciplines that are typically part of family medicine residency training. Finally, it is difficult

teaching the features of the PCMH when the concept is in evolution, and faculty are relative novices in practicing within a medical home. Graduates of residencies today are the future leaders of practice transformation, and the P⁴ programs are learning valuable lessons about what it takes to prepare their residents for redesigned practices of the future.¹⁷ The high level of commitment of these programs to change residency training created important momentum needed to see the innovations through.

Another important finding from this assessment at baseline was that within 15 months of receiving notification they were chosen for P⁴, nearly all P⁴ programs were able to develop and refine innovation hypotheses and map these to relevant

evaluation measures. The skill sets necessary for this type of work are not abundant in residencies, and the site visits made by the P⁴ evaluation team facilitated both the hypotheses refinement and selection and mapping of assessment measures.

Because of the site visit process, the hypotheses were rigorous, linked to relevant measures, and were designed to identify relevant comparisons for testing. Typically, researchers include power analyses to ensure their sample size is large enough to detect changes that exist and that can be attributed to the intervention. However, the P⁴ study design is an observational case series with each program serving as its own control. Though it will likely be impossible to formally test each proposed hypothesis, the number of residents who will ultimately graduate from P⁴ programs is significant, and cross-program assessments of some innovation work may be plausible because of standardized data procedures. At a minimum, findings from P⁴ will inform residency educators around the United States on meaningful findings about what is achievable and will provide important information on the educational impact of innovations being tested.

We also learned that programs are adaptive, committed to their residents and to redesign that prepares them for emerging models of care and can sometimes succeed in identifying funding to ensure the testing of their innovations. More than half of the programs applied for grants to support P⁴ activities, and nearly half of them received funding to assist them at the outset. While many sought national HRSA funding for these activities, others sought resources from local sources and were successful. On the one hand this is encouraging as it will likely be impossible to fund residency redesign among all 460 family medicine residencies across the United States with a common source of support. On the other hand, it is discouraging to observe the restricted funding

base for educational research and development, especially given how lean the budgets are for family medicine residencies.

The strength of this baseline assessment includes that we were able to collect complete data on all 14 residency programs, that the programs are broadly representative of many of the characteristics of family medicine residency programs around the United States, and that the evaluation team was able to provide important assistance to all programs in shaping their innovations, hypotheses, and measures. It is true, however, that these programs all chose to apply to be part of P⁴ and, as a result, are probably atypical in their commitment to large-scale change. Weaknesses include that residencies are underpowered to formally test some of their hypotheses and that sites unable to attain funding may have different experiences in implementing and assessing change compared to those who did attain funding. We plan to make this last weakness a strength by assessing the impact of receipt of funding on assessment that will be conducted in the wrap-up phase of P⁴. Finally, it is highly likely that the P⁴ programs are unusually motivated residency programs. As such, they might not be typical of family medicine residencies in general in terms of their adaptive reserve, capacity to change, or program leadership.

In conclusion, the P⁴ project had a successful launch and to date has retained all 14 programs that started with the project and established a robust, baseline data set. The stage is set to learn about these innovations, their effects, and to work with the residencies and policy leaders to discern implications for productive revisions in training.

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