

Residency Education

Aspects of the Patient-centered Medical Home Currently in Place: Initial Findings From Preparing the Personal Physician for Practice

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Background and Objectives: *The Patient-centered Medical Home (PCMH) is a central concept in the evolving debate about American health care reform. We studied family medicine residency training programs' continuity clinics to assess baseline status of implementing PCMH components and to compare implementation status between community-based and university training programs. Methods:* We conducted a survey 24 continuity clinics in 14 residency programs that are part of the Preparing the Personal Physicians for Practice (P⁴) program. We asked questions about aspects of P⁴ that had been already implemented at the beginning of the P⁴ program. We defined high implementation as aspects that were present in >50% of clinics and low implementation as those present in <50% of clinics. We compared features at university-based and community-based clinics. **Results:** High areas of implementation were having an electronic health record (EHR), fully secured remote access, electronic patient notes/scheduling/billing, chronic disease management registries, and open-access scheduling. Low areas of implementation included hospital EHR with computerized physician order entry, asynchronous communication with patients, ongoing population-based QA using EHR, use of preventive registries, and practice-based research using EHR. Few differences were noted between university- and community-based residency programs. **Conclusions:** Many features of the PCMH were already established at baseline in programs participating in P⁴.

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The Patient-centered Medical Home (PCMH) is advocated as an important element of health reform based on evidence of improved patient outcomes in primary care at lower cost.¹⁻⁷ One study found that US states that relied more on primary care have lower Medicare spending, lower resource use, lower utilization rates, and better quality of care, as measured by fewer intensive care deaths and a higher composite quality

score.² Starfield's work³⁻⁶ included a review of several studies comparing health care within the United States and between the United States and other countries and found that adults with a primary care physician versus those who receive care from a specialist had 33% lower costs of care and were 19% less likely to die, even after adjusting for demographic and health characteristics. Starfield also found that primary care physician supply is consistently associated with improved health outcomes for cancer, heart disease, stroke, infant mortality, low birth weight, and life expectancy. Further, in both England and the United States, each additional primary care physician per 10,000 persons is associated with a 3%–10% decrease in mortality rate.³

The 2004 report on the Future of Family Medicine⁸ contributed to the development of the PCMH,¹ which is an idealized model of primary care in which the following essential features are assured: (1) each patient has an ongoing relationship with a personal physician

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trained to provide first contact, (2) continuous and comprehensive care, (3) care provided by teams of individuals collectively or the team is responsible for arranging care with other qualified professionals as needed, (4) patients and their families are directly engaged in their own care planning, so care is coordinated and/or integrated across all elements of the health care system and the patient's community, (5) care is facilitated by information technology, such as electronic health records and disease registries, (6) information exchanges about health and health care occur according to patient need, such as the use of asynchronous communication (eg, e-mail) and enhanced access to health care through expanded hours and open-access scheduling, (7) quality and patient safety are key principles, based on patient advocacy, care planning, and the use of evidence-based medicine and clinical decision support tools, and (8) payment reform that appropriately recognizes the added value provided to PCMH patients.

Though the evidence for primary care appears solid, the expected results of the PCMH are largely reasoned rather than empirically demonstrated. Thus, much more needs to be learned about the contribution each component of the PCMH makes in the balance between quality and cost-effective health care.

One of the central recommendations of the 2004 Future of Family Medicine Report^{8,9} was for a period of intense innovation in family medicine residency education that would enhance our capacity to produce physicians capable of effectively practicing in the PCMH and leading this transformation process.¹⁰ This led to the development of the Preparing the Personal Physician for Practice (P⁴) initiative, which is described in detail elsewhere.¹¹ Briefly, it is a comparative case study of 14 residencies that are experimenting with changes in residency education, many but not all of which include aspects of the PCMH. P⁴ began in 2007 and will conclude in 2012. P⁴ is sponsored by the American Board of Family Medicine and the Association of Family Medicine Residency Directors.¹¹ The underlying principle of P⁴ is to learn how to improve the graduate medical education of family physicians so they are prepared to be outstanding personal physicians working in the now emerging PCMH. A central feature of P⁴ is the evaluation of these residency innovations.

When family medicine residencies were first established, many community hospitals were quick to sponsor them because of the likelihood that graduates from new residencies would practice in the surrounding communities, helping to resolve major shortages of general practitioners. Consequently, a large proportion of programs were established outside university settings, which precipitated decades of discussion about the advantages and disadvantages of residencies in different settings.

The purpose of this paper is to report on the initial status of PCMH components in the P⁴ residents' con-

tinuity practice sites and to compare PCMH features between community-based residency programs and university programs during the baseline period. Our working hypothesis was that university-based residency programs would have more features of the PCMH actively used in continuity clinic practices compared to community-based residency programs. This hypothesis was based on our assumption that clinics with direct ties to university institutions, known for developing and implementing technological advances, would have implemented patient-centered innovations more quickly than their community-based counterparts.

Methods

The P⁴ Program

The P⁴ program is organized as a learning collaborative comprised of the 14 purposefully chosen family medicine residencies, a steering committee, an evaluation team from Oregon Health and Science University, and advisers from other disciplines and health-oriented organizations. The P⁴ selection process involved invitation to all accredited family medicine residency programs in the United States, including newly accredited programs, and applying involved a two-stage process consisting of a letter of intent, followed by a detailed application for those selected to proceed to the second stage.

The steering committee considered eight selection criteria: (1) importance of the proposed innovations for broad application to the training of family physicians to be personal physicians, (2) reputation, experience, and leadership of the applicant residency program and its sponsors, (3) innovativeness of proposed changes, (4) alignment with PCMH characteristics, (5) capacity to evaluate proposed innovations and conduct the experiment on site, (6) likelihood that proposed innovations would inspire students, residents, faculty, and practicing physicians toward outstanding performance, (7) sustainability and financial viability, and (8) ability to work well with other residencies and the P⁴ Steering Committee.¹¹

Survey Design and Testing Procedures

Evaluation of the P⁴ initiative involved several surveys that were designed and tested prior to implementation, a process that included initial review and revision by the P⁴ steering committee and consultants and pilot testing with faculty at family medicine clinics at OHSU and the University of Washington (not part of the P⁴ project). Survey questions were revised and retested with different clinics until no further changes were needed to the instrument to assure construct and content validity. In addition, as part of the data cleaning process, any responses that were inconsistent with expected values were checked with the programs/sites that completed the surveys.

The survey reported in this article was designed to assess features of the continuity clinics the residents would be working in as part of their residency program and contained 49 items, including items assessing features of the learning setting (practice type, how patients are assigned to physicians, percent of visits in each program year that are routine and percent that were acute, number of days on average to different types of health care appointments, number of exam rooms, full-time equivalents for physicians, mid-level providers, and ancillary health care staff, and status as being part of an integrated health system (with specialists and hospital). In addition, 28 items assessed the status of implementation of features of the PCMH in two categories: (1) electronic features of the medical home, such as use of electronic health records (EHR) and (2) non-electronic comprehensive features, such as use of teams and group visits to manage patient care. Survey items were scored on a 4-point Likert scale as being absent (not likely to be implemented), in the planning stage (implementation likely in the next 12 to 24 months), present (implemented with major upgrades likely), and mature (full function, any upgrades minor).

Data Collection

A contact for data collection was identified at each site (eg, program director or residency coordinator), and an institutional review board (IRB) template was developed to assist programs in undertaking their IRB reviews to ensure that core data collection activities (those expected of each P⁴ site) were included in the application. The specific IRB applications differed by site based on what innovations they were testing and what site-specific measures would be used for assessment. All sites and OHSU received an IRB review, and sites were granted exemptions, waivers, or approvals. Sites were provided the residency continuity clinic survey to administer, and completed surveys were sent to OHSU for processing.

Data Analysis

Residency site categorization used self-assigned residency codes from the American Academy of Family Physicians (AAFP) and is shown in Table 1. The categories include (1) community based, unaffiliated with a university, (2) community based, university administered, (3) community based, university affiliated, and (4) university based. None of the P⁴ sites fit into the community based, unaffiliated with a university category. For our analyses, we considered community based university affiliated to be community-based sites, and we collapsed categories 2 (community based, university administered) and 4 (university based) into a second group representing university-based or administered sites. We created these categories based on the tightness of the relationships to universities, which tend to be closer for administered programs than affiliated

programs. Response categories for status of the PCMH (absent, planning, present, and mature) were collapsed into two categories, present and absent, because of small numbers and because planning processes can take a significant amount of time and do not necessarily indicate a features implementation is imminent.

Analyses were conducted on the sample of 24 continuity clinics from 14 residency programs (Table 1). Descriptive statistics were used to characterize study participants' responses. "Not applicable" responses were excluded from some analyses, which are described later. Comparisons were made for continuous variables using two independent samples *t* tests or Wilcoxon-Mann Whitney test for non-normally distributed variables. Categorical variables were analyzed using the chi-square test; in cases where cell sizes were small, Fisher's exact test was used. All tests were two-tailed, with alpha to determine statistical significance set at ≤ 0.05 .

Results

Our response rate from P⁴ sites for the clinic survey was 100%, with a total of 24 clinics contributing data. Ten of these clinics were categorized as university based or administered, and 14 were categorized as community based. We found a range of PCMH electronic features in place (Table 2), with high areas of implementation ($\geq 50\%$) being EHR in place, fully secured remote access available, patient notes entered directly, electronic scheduling and billing, chronic disease management registries in use, and open-access scheduling. Low areas of implementation ($<50\%$) included hospital EHR with full-computerized physician order entry, asynchronous communication with patients, ongoing population-based quality assurance program using EHR, use of preventive registries, and practice-based research using EHR.

Only two areas significantly differed between the two types of residencies: P⁴ community-based continuity clinics were over three times more likely to be paperless compared to P⁴ university sites, and P⁴ university sites were nearly five times more likely to use asynchronous communication with other clinicians (Table 2).

Our assessment of implementation of other features of the PCMH (Table 3) indicates high implementation ($\geq 50\%$) of many non-electronic features of the PCMH, including physicians being assigned as personal physicians to patients, having expanded hours, telephone monitoring systems, using teams to manage patient care, integrated behavioral health, group visits, adequate physical and parking space, convenient public transportation, and having a patient-centered (versus physician-centered) practice. The only areas implemented less in fewer than 50% of clinics were having a clinical pharmacy in place and having integrated case management for social services.

Table 1
P⁴ Residency Sites

<i>Residency Program</i>	Program Type	<i># of Continuity Clinics 2006–2007</i>	<i># of Residents 2006–2007</i>
Baylor HCHD Family Medicine Residency Program, Houston	University based	1	16
Cedar Rapids Medical Education Foundation, Cedar Rapids, Iowa	Community based, university affiliated	1	19
Christiana Care Health System Family Medicine Residency Program, Wilmington, Del	Community based, university affiliated	1	21
Hendersonville Family Practice Residency Program, Hendersonville, NC	Community based, university affiliated	4	9
John Peter Smith Hospital Family Medicine Residency Program, Fort Worth, Tex	Community based, university affiliated	2	65
Lehigh Valley Family Medicine Program, Allentown, Pa	Community based, university affiliated	1	21
Loma Linda Family Medicine Residency, Loma Linda, Calif	Community based, university administered	1	22
Middlesex Hospital Family Medicine Residency Program, Middletown, Conn	Community based, university affiliated	3	24
Tufts University Family Medicine Residency, Malden, Mass	Community based, university affiliated	1	24
University of Colorado Family Medicine Residency, Denver	University based	2	19
University of Missouri-Columbia Family Medicine Residency, Columbia, Mo	University based	3	35
University of Rochester Family Medicine Residency Program, Rochester, NY	Community based, university administered	2	30
Waukesha Family Medicine Residency Program, Waukesha, Wis	Community based, university affiliated	1	17
West Virginia University Rural Family Medicine Program, Harpers Ferry, WV	Community based, university administered	1	12

Our comparisons of non-electronic features according to type of residency continuity clinic also found only two of 13 variables that were statistically different, indicating that for nearly 85% no differences were noted (Table 3). P⁴ university continuity clinics were more than twice as likely to use a credible patient satisfaction survey. P⁴ community-based continuity clinics were more than twice as likely to have integrated case management social services in use. Characteristics of the clinics according to type of program (university versus community) indicates that across all three residency program years, residents in community-based sites have more acute and fewer routine (health maintenance/chronic illness) continuity health care visits than residents in university settings (Table 4).

Discussion

To our knowledge, our study is the first to characterize the status of implementation of features of the PCMH in residency training and to characterize the differences that exist in community based versus university continuity clinics. Our selection criteria for P⁴ were based on the redesign of educational training. Though many programs chose to include experiments involving PCMH features, this was not a requirement, and programs were selected based on their innovative

educational ideas and not PCMH features they had implemented prior to baseline assessment. We found that eight of nine electronic features of the PCMH were implemented in 50% or more of both university and community-based continuity clinics and that the majority of continuity clinics in both settings had implemented non-electronic PCMH features.

We disproved our hypothesis that university sites would be more likely to have implemented features of the PCMH compared to community-based sites, since few differences were found between the two settings. There are many reasons why comparisons between university- and community-based programs can be justified. Residents in university programs may be more likely to do their rotations on specialty services, like obstetrics, and there may be more competition for complex patients or procedures because of the number of other residencies associated with university versus community programs. It is time for collaboration in the study of medical education so we can understand the impact of learning setting on the development of personal physicians.

Of the minor differences that were found, two (integrated case management and social services and practices being paperless) were more likely to be implemented in P⁴ community-based sites than the university

Table 2

Status of Electronic Features of the Patient-centered Medical Home According to University Affiliation

<i>Characteristics</i>	<i>University Based/ Administered (n=10)</i>	<i>Community Based (n=14)</i>	<i>P Value</i>
Electronic Health Record (EHR) in practice	7/10 (70.0)	10/14 (71.4)	1.00
Median length of time EHR in practice (among those who have it) and interquartile range (IQR). Total years and months combined	2.0 (1.2-4.4)	2.3 (1.8.3)	.73
Practice is paperless (all interfaces and scanning work—no paper charts)	2/10 (20.0)	9/14 (64.3)	.05
Fully secured remote access available	8/10 (80.0)	11/14 (78.6)	1.00
Patient notes either entered directly, through templates, or speech recognition	8/10 (80.0)	9/13 (69.2)	.66
Electronic scheduling system integrated with EHR	7/10 (70.0)	8/14 (57.1)	.68
Electronic billing system integrated with EHR	5/10 (50.0)	7/14 (50.0)	1.00
Electronic orders (eg, lab, X ray) integrated with EHR	3/10 (30.0)	8/14 (57.1)	.24
Hospital EHR with full computerized physician order entry in use	2/10 (20.0)	2/14 (14.3)	1.00
Secure HIPPA-compliant asynchronous communication with patients, including e-mail in use	3/10 (30.0)	5/14 (35.7)	1.00
Asynchronous communication with other clinicians in use	10/10 (100.0)	3/14 (21.4)	<.01
Ongoing population-based quality assurance program (QA) using an EHR	4/10 (40.0)	7/14 (50.0)	.70
Chronic disease management registries in use	5/10 (50.0)	10/14 (71.4)	.40
EHR-based preventive services registries in use	1/10 (10.0)	4/12 (33.3)	.32
Practice-based research done using an EHR	0/10 (0%)	4/14 (28.6)	.11
Advanced or open-access scheduling in use	6/10 (60.0)	6/14 (42.9)	.68

Items in bold text showed significant differences between community and university sites.

sites. The likelihood of having more integrated case management and social services in community-based sites may indicate closer relationships to community services. We speculate that community sites were more likely to be paperless because they may not have to handle corresponding and record sharing with multiple institutions like tertiary care centers do. Another possibility is that the community sites had their EHR in place longer and have therefore had more time to become paperless.

University continuity clinic sites were more likely to have implemented asynchronous communication with other clinicians and have a credible patient satisfaction survey in place. One possible explanation for the first difference may lie in the type of electronic health record used in each site. University sites may be more likely to have an electronic record for their entire health system that includes specialists and to use this electronic record system for asynchronous communications. University

sites are also likely to be located near other sources of social and mental health services and therefore not have these resources integrated into the clinic itself. Regarding the differences in the status of patient satisfaction surveys, it may be that university clinics are more likely to have institution-wide mandates with single vendors than community continuity clinics do. Regardless of the minor differences we found, our findings are important because they indicate that resident exposure to PCMH attributes, at least in our sample of P⁴ residencies, is similar regardless of which training site they choose.

How do P⁴ program residency training sites compare to other residency training programs in the United States? Based on a recent survey of characteristics and geographic locations of residency training,¹² the vast majority of family medicine residency training sites (92.4%) are located in urban areas, with 11%–12% of these having remote, rural continuity clinical sites in addition to the 7.6% located more rural settings. Fifty-

Table 3

Status of Other Comprehensive Features of the Patient-centered
Medical Home According to University Affiliation

<i>Characteristics</i>	<i>University Based/ Administered (n=10)</i>	<i>Community Based (n=14)</i>	<i>P Value</i>
Physicians assigned to be patients' personal physician			
Residents only	1/10 (10.0)	0/14 (0.0)	
Residents and faculty	9/10 (90.0)	14/14 (100.0)	.42
Expanded hours (eg, clinic hours after 6 pm on weekdays or weekend clinic hours) in place	6/10 (60.0)	8/14 (57.1)	1.00
Functional quality monitoring telephone system (eg, system to monitor call abandonment or time to answer) in use.	9/10 (90.0)	8/14 (57.1)	.17
Credible, reliable patient satisfaction survey used at the practice level	9/10 (90.0)	5/14 (35.7)	.01
Using teams to manage patient care in place	5/10 (50.0)	8/14 (57.1)	.73
Integrated behavioral health in use	6/10 (60.0)	11/14 (78.6)	.39
Integrated "case management," social services in use	3/10 (30.0)	10/14 (71.4)	.10
Clinical pharmacy support in place	4/10 (40.0)	5/13 (38.5)	1.00
Group visits in use	4/10 (40.0)	8/14 (57.1)	.68
Adequate physical space available	10/10 (100.0)	10/14 (71.4)	.11
Adequate, free parking available	10/10 (100.0)	13/14 (92.9)	1.00
Convenient public transportation available	8/10 (80.0)	8/13 (61.5)	.41
Overall status of practice as patient centered versus physician centered	7/10 (70.0)	10/14 (71.4)	1.00

Items in bold text showed significant differences between community and university sites.

seven percent of P⁴ sites are located in urban areas, so rural continuity practices are overrepresented in P⁴ compared to non-P⁴ sites. Another recent survey¹³ found that 69% of family medicine graduates reported having attended a community-based program. Similarly, 71% of P⁴ sites are associated with community-based residency training. We found no recent publications that provided data that allowed us to make comparisons of features of the PCMH.

The strength of our study is that we achieved a 100% response rate to a tested survey on the status of the PCMH in residency training and whether differences exist according to type of residency program. A limitation is that our sample is not likely to be generalizable to other settings since the P⁴ sites were selected based, in part, on their ability to inspire substantial changes in the content, structure, and locations of training of family physicians and to guide future revisions in accreditation and certification requirements. It is possible that a survey of non-P⁴ residency training sites would yield very different findings.

Another limitation of this study is that some of the continuity clinics selected were administered under larger residency programs; therefore, data from these clinics could be correlated with one another. Due to the small sample size of our data, we were unable to evaluate this possibility.

In addition, the survey question asked respondents at practices to self-identify as the practice being physician centered versus patient centered, rather than being able to objectively measure this variable. We saw no alternative to self-identification as we know of no measure that accurately identifies a practice as patient or physician centered. Though the TransformMED group has developed an instrument to assess PCMH features,^{14,15} it was not designed as a validated research tool to accurately classify practices with specific approaches linked to patient outcomes. Clearly, more research is needed in defining patient centeredness.

In summary, our assessment of P⁴ continuity clinics indicates that many features of the PCMH were established at baseline in our sample of residencies aspiring

Table 4

Characteristics of the Residency Continuity Clinic Sites by University Affiliation

Characteristics	University Based/Administered Clinics (n=10)	Community Based Clinics (n=14)	P Value
Learning setting (frequency and percent)			
Family health center model office	4/10 (40.0)	10/14 (71.4)	
Traditional family medicine single-specialty office	3/10 (30.0)	3/14 (21.4)	
Other	3/10 (30.0)	1/14 (7.1)	.28
Mean percentage and standard error (SE) of continuity visit types by program year			
<i>Year 1</i>			
Routine (Health Maintenance/Chronic illness)	82.0 (9.1)	66.1 (4.2)	.09
Acute	9.0 (4.4)	33.9 (4.2)	.005
<i>Year 2</i>			
Routine	77.0 (10.2)	70.4 (3.1)	.57
Acute	13.0 (4.5)	29.6 (3.1)	.01
<i>Year 3</i>			
Routine	78.4 (10.1)	68.4 (3.7)	.26
Acute	11.6 (3.6)	31.6 (3.7)	.005
Median number of days and interquartile range (IQR) to:			
<i>First available new patient appointment</i>			
Faculty	5.5 (2–32)	6.0 (1–20)	.62
Resident	3.0 (2–24)	7.0 (1–16)	.76
<i>First available follow-up appointment</i>			
Faculty	4.5 (2–9)	3.0 (1–7)	.76
Resident	2.0 (1–7)	6.0 (2.5–7)	.47
<i>First available acute appointment</i>			
Faculty	1.0 (1–2)	1.0 (0–1)	.09
Resident	1.0 (1–2)	1.0 (0–1)	.21
Mean number of exam rooms and SE	22.3 (3.2)	16.8 (2.7)	.20
Clinician configuration [Median (IQR)]			
Faculty (FTE for family physicians only)	3.0 (2.2–9.6)	3.75 (1.2–6)	.39
Residents total number	11.0 (7–18)	15 (6–21)	.98
Nurse practitioners—FTE	1.4 (0–3.1)	0 (0–0.3)	.02
Physician assistants—FTE	0 (0–0.1)	0 (0–0.25)	.57

Items in bold text showed significant differences between community and university sites.

to change how patient care is delivered. This message is true for both P⁴ university-based and community-based programs. Given this enthusiasm, our network of primary care residency training sites can now begin to contribute to studies of not only how elements of the PCMH contribute to overall health of patients and communities but also how best to train physicians early in their careers, so we can also begin to understand how this training translates elements of the PCMH into medical practice beyond residency.

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REFERENCES

1. American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. Joint principles of the Patient-centered Medical Home. March 2007. www.pcpcc.net/content/joint-principles-patient-centered-medical-home. Accessed July 27, 2008.
2. Dartmouth Atlas of Health Care. Variation among states in the management of severe chronic illness, 2006.
3. Starfield B, Shi L, Macinko J, et al. Improving chronic illness care: translating evidence into action. *Health Aff* 2001;20:64-78.
4. Starfield B, Shi L, Macinko J. Contributions of primary care to health systems and health. *Millbank Q* 2005;83:457-502.
5. Starfield B, Shi L, Grover A, Macinko J. The effects of specialist supply on populations' health: assessing the evidence. *Health Affairs Web Exclusive*, March 15, 2005 (W5-97).

6. Starfield B. Presentation to The Commonwealth Fund, Primary Care Roundtable: Strengthening adult primary care: models and policy options. October 3, 2006.
7. Beal AC, Doty MM, Hernandez SE, Shea KK, Davis K. Closing the divide: how medical homes promote equity in health care: results from The Commonwealth Fund 2006 Health Care Quality Survey. The Commonwealth Fund, June 2007.
8. The Future of Family Medicine Project Leadership Committee. Future of Family Medicine: a collaborative project of the family medicine community. *Ann Fam Med* 2004;2:S3-S32.
9. Fineberg HV, Abrommowitz HI, Loh AWT. Forward the Future of Family Medicine Report. *Ann Fam Med* 2004;2:S2.
10. Bucholz JR, Matheny SC, Pugno PA, David A, Bliss EB, Korin EC. Task Force Report 2: Report of the Task Force on Medical Education. *Ann Fam Med* 2004;2:S51-S64.
11. Green LA, Jones SM, Fetter G Jr, Pugno PA. Preparing the personal physician for practice: changing family medicine residency training to enable new model practice. *Acad Med* 2007;82(12):1220-7.
12. Characteristics and geographic location of family medicine residency programs. <http://depts.washington.edu/wwamiric/pdfs/Chartbook/ChartbookPgs11-20.pdf>.
13. Abdellah FG, Levine E. Better patient care through nursing research. New York: Macmillan, 1965.
14. Nutting PA. Journey to the future of family medicine. *Ann Fam Med* 2008;6:270-2.
15. TransforMED is how...primary care practices become patient-centered medical homes. www.transformed.com/assessment.cfm.