HEALTH CARE REFORM

Patient-Centered Medical Home Characteristics and Staff Morale in Safety Net Clinics

Sarah E. Lewis, MSPH; Robert S. Nocon, MHS; Hui Tang, MS; Seo Young Park, PhD; Anusha M. Vable, MPH; Lawrence P. Casalino, MD, PhD; Elbert S. Huang, MD, MPH; Michael T. Quinn, PhD; Deborah L. Burnet, MD, MA; Wm Thomas Summerfelt, PhD; Jonathan M. Birnberg, MD; Marshall H. Chin, MD, MPH

Background: We sought to determine whether perceived patient-centered medical home (PCMH) characteristics are associated with staff morale, job satisfaction, and burnout in safety net clinics.

Methods: Self-administered survey among 391 providers and 382 clinical staff across 65 safety net clinics in 5 states in 2010. The following 5 subscales measured respondents' perceptions of PCMH characteristics on a scale of 0 to 100 (0 indicates worst and 100 indicates best): access to care and communication with patients, communication with other providers, tracking data, care management, and quality improvement. The PCMH subscale scores were averaged to create a total PCMH score.

Results: Six hundred three persons (78.0%) responded. In multivariate generalized estimating equation models, a 10% increase in the quality improvement subscale score was associated with higher morale (provider odds ratio [OR], 2.64; 95% CI, 1.47-4.75; staff OR, 3.62; 95% CI, 1.84-7.09), greater job satisfaction (provider OR, 2.45; 95% CI, 1.42-4.23; staff OR, 2.55; 95% CI 1.42-4.57), and freedom from burnout (staff OR, 2.32; 95% CI, 1.31-4.12). The total PCMH score was associated with higher staff morale (OR, 2.63; 95% CI, 1.47-4.71) and with lower provider freedom from burnout (OR, 0.48; 95% CI, 0.30-0.77). A separate work environment covariate correlated highly with the quality improvement subscale score and the total PCMH score, and PCMH characteristics had attenuated associations with morale and job satisfaction when included in models.

Conclusions: Providers and staff who perceived more PCMH characteristics in their clinics were more likely to have higher morale, but the providers had less freedom from burnout. Among the PCMH subscales, the quality improvement subscale score particularly correlated with higher morale, greater job satisfaction, and freedom from burnout.

Arch Intern Med. 2012;172(1):23-31

Author Affiliations: Departments of Medicine (Mss Lewis and Vable, Mr Nocon, and Drs Huang, Quinn, Burnet, Birnberg, and Chin) and Health Studies (Dr Park) and Center for Health and the Social Sciences (Ms Tang), University of Chicago, and Advocate Healthcare System (Dr Summerfelt), Chicago, Illinois; and Department of Public Health, Weill Cornell Medical College, New York, New York (Dr Casalino). Ms Lewis is now with The Gillings School of Global Public Health, The University of North Carolina at Chapel Hill. Dr Park is now with the University of Pittsburgh, Pittsburgh, Pennsylvania. Ms Vable is now with the Harvard School of Public Health, Boston, Massachusetts. Dr Birnberg is now with Engaged Health Solutions, Chicago, Illinois.

POLICY MAKERS, HEALTH CARE organizations, and patient advocates have tended to focus on whether the patient-centered medical home (PCMH) improves patient outcomes. However, a critical question is how the PCMH influences provider and clinical staff morale, satisfaction, and burnout (MSB). Core components of the PCMH include comprehensive primary care, quality improvement, care management, and enhanced access.[1,2] For many practices, the model may increase workload and significantly change staff roles. Therefore, providers and staff may be strained by the transformation that occurs with implementation of the PCMH.[3] On the other hand, providers and staff might benefit from a more efficient and satisfying work environment.

The effect of the PCMH on providers and staff in safety net clinics is especially important because personnel turnover has been high and the work environment can be difficult.[4] Resources are frequently constrained, physician and nursing shortages cause understaffing, patients often have significant social and economic challenges, and access to specialists is limited.[5] Within this context, the Centers for Medicare & Medicaid Services have recently undertaken the Federally Qualified Health Center Advanced Primary Care Practice Demonstration,[6] a project evaluating the effectiveness, accessibility, quality, and cost of patient-centered care in up to 500 federally qualified health centers (HCs). The PCMH may be important for HCs to provide quality care in this complex evolving environment,[1] but success and sustainability are dependent on provider and staff buy-in to the model.[3]

See Invited Commentary at end of article

The literature describes general determinants of MSB among health care providers and staff. Work environment is cru-

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

cial.[7,8] Among physicians, correlates of MSB include control over one's own work, positive workplace relationships, differences between experienced and expected workload, and satisfaction with income.[9] Among nurses, correlates of MSB include autonomy, job stress, and nurse-physician collaboration.[10] In HCs, sources of increased stress are insufficient resources, high workload, and time pressure. Stress increases the likelihood that staff leave an organization within 3 years.[4]

Specific domains of the PCMH may influence MSB. Physicians whose practices engaged in quality improvement efforts noted significantly less isolation, stress, and dissatisfaction with their work.[11] In the quality improvement initiative of the Health Disparities Collaboratives[12] program by the Health Resources and Services Administration, 40% of HCs reported improved staff morale as a result of the initiative, but 20% noted worsened staff morale. Participants stated that personal recognition, career promotion, and skill development opportunities would improve morale and lower burnout. Various care management and open access interventions improve job satisfaction,[13-15] while difficulty in coordinating care with other providers negatively correlates with job satisfaction.[16]

We are aware of only one peer-reviewed study that has directly examined the effect of PCMH implementation on provider outcomes; none to date have examined staff outcomes. The PCMH intervention at a Group Health Cooperative of Puget Sound (Seattle, Washington) clinic reduced provider emotional exhaustion and depersonalization scores by half.[17] However, this study has limited generalizability, especially to safety net clinics serving vulnerable populations. Therefore, we sought to determine whether PCMH characteristics were associated with staff morale, job satisfaction, and burnout across 65 safety net clinics.

METHODS

We conducted a mailed self-administered survey among providers and clinical staff practicing at 65 safety net clinics during the first year of the 5-year Safety Net Medical Home Initiative supported by The Commonwealth Fund. At the time of the study, Qualis Health and the MacColl Institute for Healthcare Innovation[18] were working with providers and staff in the clinics to implement the PCMH using a framework of 8 change concepts. Implementation of the first 2 change concepts began during the survey period; these included (1) empanelment of patients to providers and (2) continuous and team-based healing relationships linking patients to a provider and care team.

SURVEY

Surveys were mailed to 391 providers and 382 clinical staff across 65 participating safety net clinics. Providers were defined as physicians, physician assistants, and nurse practitioners. Clinical staff were defined as behavioral health specialists, educators, certified medical assistants, counselors, dieticians, medical assistants, nurses (licensed practical nurse or registered nurse), psychiatrists, psychologists, or social workers. The Safety Net Medical Home Initiative clustered clinics into 5 regional coordinating centers (RCCs) in Colorado, Idaho, Massachusetts, Oregon, and Pennsylvania (clustered around Pittsburgh). The RCCs helped coordinate the training of the HCs in that region. The 5 RCCs were chosen from 42 candidate RCCs based on selection criteria that included size, geographic setting, leadership support, prior PCMH efforts, prior quality improvement activities, adequate staffing, and support from state Medicaid agencies and other stakeholders.

In 2010, we mailed surveys to providers and staff. Based on power calculations assuming a 70% response rate, we set a target of 15 responses from each clinic, with a split of 9 providers and 6 staff. For clinics with more than 15 providers and staff, we randomly surveyed 9 providers and 6 staff at each clinic; for clinics with fewer than 15 providers and staff, all providers and staff were surveyed. If a clinic had fewer than 9 providers, we included more staff until we had surveyed 15 respondents at that clinic. A one-time incentive of $10 was included with each initial mailing. After the initial surveys were mailed, 2 more waves of the surveys were mailed to nonresponders.

PCMH CHARACTERISTICS

Based on the 2008 National Committee for Quality Assurance PCMH standards,[19] we created the following 5 PCMH subscales: access to care and communication with patients, communication with other providers, tracking data, care management, and quality improvement. We created a total PCMH score, which was the mean of 4 of 5 PCMH subscale scores (the surveys and scoring algorithms are available http://www.commonwealthfund.org/Content/Innovations/Tools/2011/Staff-Morale-in-Safety-Net-Clinics.aspx). Questions in the communication with other providers subscale asked respondents how often they experienced difficulty in communicating with outside specialists, hospital-based providers, and emergency departments. We believed that these questions would not be relevant to staff, so they were excluded from the staff survey and the total PCMH score calculation. Some questions were taken or adapted from health care provider surveys[7,20] and from PCMH evaluation surveys[20,21] (M. W. Friedberg, MD, MPP, written communication, September 9, 2010), and some questions were created by us. Questions were selected for subscales based on content validity. Each question was rescaled from a 5-point Likert-type scale to a score range of 0 to 100 (0 indicates worst and 100 indicates best, with 1 on the Likert-type scale representing 0 points, 2 representing 25 points, 3 representing 50 points, 4 representing 75 points, and 5 representing 100 points). These rescaled scores were then averaged within their respective subscale. Finally, the total PCMH score was calculated as the mean of 4 of 5 PCMH subscale scores (excluding communication with other providers), yielding a total PCMH score with a potential range of 0 to 100. Cronbach α for the 5 subscales ranged from .48 (5-item access to care and communication with patients subscale) to .82 (7-item care management subscale), with an overall $\alpha = .87$ for the 22-item total PCMH score.

COVARIATES

We constructed the following control variables based on factors known to be associated with MSB in prior literature: the presence of an electronic medical record (EMR),[22] work environment,[7-9] whether the clinic reported provider or nursing shortages,[12] and years since the end of clinical training.[9] We used a binary variable for the presence or absence of an EMR. The work environment covariate subscale consists of 5 questions that examine the culture, teamwork, and leadership of the practice. Similar to the PCMH subscales, each question was rescaled from a 5-point Likert-type scale to a score range of 0 to 100, and the overall work environment score was the mean of the scores on these 5 questions. We tested for correlation of the PCMH subscales with the work environment covariate sub-

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

scale using Pearson product moment correlation coefficient to check for possible collinearity. The provider and nursing shortage questions came from a previous baseline organizational survey.[23] The order of responses in some questions was reversed to create consistent scaling (worst to best). All covariates except years since the end of clinical training were used as clinic-level variables. That is, for each clinic we took the mean of each continuous covariate and took the majority response for the binary covariates (presence of an EMR), so that all respondents within each clinic had the same value for those covariates. However, years since the end of clinical training was used as an individual-level variable.

OUTCOME VARIABLES

Three survey questions on MSB served as the 3 outcome variables for the study. Respondents were asked to "Rate staff morale in your clinic" on a 5-point Likert-type scale that ranged from "poor" to "excellent." Job satisfaction was measured by survey participants' response to the statement "Overall, I am satisfied with my current job," with responses on a 5-point Likert-type scale that ranged from "strongly disagree" to "strongly agree" (M. W. Friedberg, MD, MPP, written communication, September 9, 2010). Burnout was measured using a validated question in which respondents were prompted with the statement "Using your own definition of 'burnout,' please check one" and were given 5 options along an ordinal response scale that ranged from "I enjoy my work. I have no symptoms of burnout," to "I feel completely burned out and often wonder if I can go on."[24] We used pairwise correlation to examine the relationships among MSB. All 3 outcome variables were measured at the individual level and were converted to binary values for logistic regression analysis, with cut points based on face validity and the distribution of responses.

STATISTICAL ANALYSIS

We generated descriptive statistics for providers, staff, and clinic characteristics. To investigate the relationship between the binary outcome variables (MSB) and PCMH subscale scores, while allowing for a clustering effect, we fitted univariate and multivariate generalized estimating equation models. In particular, we ran general linear models with logistic link and exchangeable correlation structure to allow clustering effect within each clinic. For univariate analyses, the clinic-level mean (taking the mean of individual-level values for each clinic) for the 5 PCMH subscale scores and the total PCMH score were used as the independent variable in a univariate model for each individual's MSB (18 univariate models in total). For multivariate analyses, the PCMH subscale scores for access to care and communication with patients, tracking data, care management, and quality improvement were included with the control variables representing the presence of an EMR, provider shortage, nursing shortage, and years since the end of clinical training. We also ran a second set of multivariate models that included only the total PCMH score with all of the covariates. For both univariate and multivariate models, we included interaction terms between the respondent's position type (provider vs staff) and the PCMH subscale and total PCMH scores to allow differential influence of these covariates for different position types.[25,26] Because work environment is conceptually important but highly correlated with several PCMH subscales and with the total PCMH score, we performed multivariate analyses with and without work environment in the models.

We reported the results of univariate and multivariate analyses using odds ratios (95% CIs) that reflected either a 10-point or 10% increase in variables coded on a scale of 0 to 100 or a change from 0 (not present) to 1 (present) for binary-coded variables. All analyses were performed using commercially available software (STATA version 11; StataCorp LP, College Station, Texas).

RESULTS

CHARACTERISTICS OF PROVIDERS, STAFF, AND CLINICS

We received 603 completed surveys (78.0%) from 773 sampled providers and staff, with a 79.8% response rate for providers and a 76.2% response rate for staff. Nonresponders (n=170) differed significantly from responders by region and by location ($P=.002$ for both). For example, nonrespondents were disproportionately from Massachusetts (40.5% for nonresponders vs 25.5% for responders, $P<.001$) and from city-based clinic locations (61.3% for nonresponders vs 50.1% for responders, $P=.01$) as opposed to suburban or rural locations. We received a similar number of responses from providers (n=312) and from staff (n=291). Most respondents were female and of non-Hispanic white race/ethnicity, and approximately half of the clinics were located in a city (**Table 1**).

MORALE, JOB SATISFACTION, AND BURNOUT

Morale showed a normal distribution, with the largest group of respondents (32.8%) rating morale in their clinics as good (**Table 2**). Job satisfaction and burnout were strongly skewed toward positive responses; the largest groupings of respondents were found in the second-highest categories, with 53.7% rating job satisfaction as very good and 49.5% noting that "Occasionally I am under stress at work, but I don't feel burned out." Morale, job satisfaction, and burnout moderately correlated with each other ($r=0.48$ for morale and job satisfaction, $r=0.32$ for morale and burnout, and $r=0.44$ for job satisfaction and burnout) ($P<.001$ for all).

DISTRIBUTIONS FOR PCMH AND WORK ENVIRONMENT

Table 3 gives the distribution of survey responses used to construct the PCMH subscale scores, the total PCMH score, and the work environment covariate. The mean (SD) total PCMH score was 64 (7) on a scale of 0 to 100. The mean (SD) PCMH subscale scores ranged from 61 (8) for access to care and communication with patients to 66 (10) for tracking data. The mean (SD) overall work environment score was 68 (10).

CORRELATES OF MORALE, JOB SATISFACTION, AND BURNOUT

In the univariate models, the PCMH subscale scores for access to care and communication with patients and for quality improvement were significantly associated with better morale and with increased job satisfaction

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

Table 1. Characteristics of Providers, Staff, and Clinics

Variable	Value
Respondents (n = 603)	
Female sex, %	78.3
Race/ethnicity, %[a]	
White	71.8
Hispanic or Latino	15.1
Black	5.1
Asian	3.3
Other[b]	4.0
Not reported	0.7
Provider or staff type, %	
Physician	33.5
Nurse practitioner or physician assistant	19.1
Registered nurse	13.3
Licensed practical nurse or medical assistant	22.7
Other[c]	11.4
Years since the end of clinical training, mean (SD)	13.1 (11.0)
Years working at this clinic, mean (SD)	6.1 (6.1)
Hours per week working at this clinic, mean (SD)	34.2 (11.6)
Primary patient population, %	
Children <18 y	6.0
Adults ≥18 y	23.6
Children and adults	70.4
Presence of an EMR, %	74.7
Clinics (n = 65)	
Location, %	
City	50.8
Suburban	7.7
Small town	15.4
Rural	18.5
Frontier	7.7
No. of providers, mean (SD)	9.6 (20.1)
Provider shortage, %	50.8
Nursing shortage, %	26.2
Clinic Patients, Mean (SD), %	
Insurance[d]	
Medicaid	37.4 (19.3)
Medicare	13.5 (10.8)
Private	19.2 (13.8)
Uninsured	28.6 (19.4)
Other public insurance	1.5 (3.5)
Hispanic or Latino ethnicity[e,f]	54.2 (18.9)
Race[e]	
White	57.2 (25.4)
African American	7.5 (10.8)
Other[g]	3.7 (4.0)
>1 Race	4.4 (16.6)
Not reported or refused	27.2 (19.0)
Limited English proficiency[e]	32.0 (26.7)

Abbreviation: EMR, electronic medical record.

[a] Ethnicity and race questions from the provider and staff surveys were combined. Any individual self-identifying his or her race or ethnicity as Hispanic or Latino was included in that grouping. All other listed categories (eg, white, black, and Asian) are exclusively non-Hispanic.

[b] Includes American Indian, Alaska Native, Native Hawaiian, and Pacific Islander.

[c] Includes behavioral health specialists, educators, counselors, dieticians, psychiatrists, psychologists, and social workers.

[d] Patient insurance data were obtained from Qualis Health and include 64 of 65 clinics (98.5%). For some clinics where site-level data were unavailable, patient insurance mix was imputed from data on the larger system or health center.

[e] Ethnicity, race, and limited English proficiency characteristics were obtained from Uniform Data System reports. Federally qualified health centers are required to report their patients' ethnic, racial and insurance demographics in the form of Uniform Data System reports to the Health Resources and Services Administration. We were able to obtain Uniform Data System information for 44 of 65 clinics (67.7%). The remaining clinics were not federally qualified health centers at the time of the survey.

[f] Hispanic or Latino ethnicity is reported independent of race and overlaps with the race categories to an unknown extent owing to the aggregated totals provided by the Uniform Data System.

[g] Includes American Indian, Hawaiian, Pacific Islander, and Asian.

Table 2. Distribution of Provider and Staff Morale, Job Satisfaction, and Burnout

Provider and Staff Rating	% of Respondents
Morale (n = 603)	
Poor	9.1
Fair	23.4
Good	32.8
Very good	27.5
Excellent	7.1
Job satisfaction (n = 598)[a]	
Strongly disagree	1.8
Disagree	7.9
Neither agree nor disagree	13.2
Agree	53.7
Strongly agree	23.4
Burnout (n = 600)	
I feel completely burned out and often wonder if I can go on.	1.3
The symptoms of burnout that I'm experiencing won't go away. I think about frustrations at work a lot.	7.8
I have one or more symptoms of burnout, such as physical or emotional exhaustion.	29.5
Occasionally I am under stress at work, but I don't feel burned out.	49.5
I enjoy my work. I have no symptoms of burnout.	11.8

[a] Response to "Overall, I am satisfied with my current job."

(**Table 4**). The PCMH subscale score for care management was associated with higher morale among clinical staff.

In the multivariate models that included 4 control variables (the presence of an EMR, provider shortage, nursing shortage, and years since the end of clinical training), higher scores on the quality improvement PCMH subscale were significantly associated with higher provider and staff morale, greater provider and staff job satisfaction, and freedom from burnout among clinical staff (**Table 5**). The associations for the other PCMH subscales were attenuated in the adjusted models. To place the meaning of the odds ratios in Table 5 into context, we give the following example of the mean marginal effect of a variable.[27] In the multivariate model without work environment, the mean marginal effects of the quality improvement subscale score on morale are 0.18 (95% CI, 0.08-0.28) for providers and 0.23 (95% CI, 0.13-0.33) for staff. In other words, a 10-point increase in the quality improvement subscale score implies mean increases of 0.18 and 0.23 in the probability of higher morale for providers and staff, respectively.

The work environment covariate correlated highly with several PCMH scores, especially with the quality improvement subscale score (r=0.78) and with the total PCMH score (r=0.59) (P<.001 for both) (**Figure**). In analyses that included work environment, the associations of PCMH subscale scores with MSB largely disappeared; however, the access to care and communication with patients subscale score correlated with higher staff morale and the quality improvement subscale score correlated with more staff freedom from burnout (Table 5).

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

Table 3. Distribution of Survey Responses Used to Construct the PCMH Subscale Scores, the Total PCMH Score, and the Work Environment Covariate[a]

Variable[b]	% of Respondents[c]				
Access to Care and Communication With Patients Subscale (mean [SD] score, 61 [8]; α = .48)					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Patients see me rather than some other provider when they come in for[d]					
A routine visit	1.3	2.6	4.9	53.7	37.5
An urgent care visit	3.9	17.9	33.1	38.6	6.5
Patients with an urgent problem can easily get a same-day appointment with me or another provider in our clinic	2.2	9.7	15.8	44.6	27.8
It is difficult to spend enough time with patients to meet their medical needs	18.0	35.0	19.0	24.7	3.4
I have adequate access to interpreters	5.3	17.1	17.1	35.5	25.0
Communication With Other Providers Subscale (mean [SD] score, 62 [12]; α = .78)					
	Rarely	Occasionally	Sometimes	Frequently	Almost Always
How often is it difficult for you to communicate about your patients with[d]					
Outside specialists	10.9	26.1	37.3	22.1	3.6
Hospital-based providers	21.7	29.1	27.1	19.4	2.7
Emergency departments	34.3	26.0	25.3	11.3	3.0
Tracking Data Subscale (mean [SD] score, 66 [10]; α = .56)					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
My practice can easily identify patients with a particular disease	2.4	12.0	21.0	48.4	16.2
Our clinic has good systems to track test results and follow up with patients	2.5	14.0	17.1	47.2	19.2
Care Management Subscale (mean [SD] score, 65 [8]; α = .82)					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Our clinic has a good system for identifying patients at high risk for poor outcomes	4.2	20.5	27.8	39.2	8.3
Our clinic intensifies services for patients at high risk for poor outcomes[e]	1.9	14.6	23.1	47.5	13.1
Our clinic individualizes services to different patients with different needs	1.2	5.8	16.1	55.4	21.5
Our clinic is effective in helping patients self-manage their chronic illness	1.4	12.7	28.9	48.2	8.8
Care is coordinated well among physicians, nurses, and clinic staff within our clinic	1.2	8.6	16.9	53.2	20.1
Our practice utilizes community resources to meet patients' care needs	0.3	8.8	18.5	50.0	22.4
Our EMR provides prompts at the time of the patient visit to remind me of key actions to take for the patients[e]	10.3	21.5	19.8	35.5	13.0
Quality Improvement Subscale (mean [SD] score, 63 [7]; α = .80)					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The structure of our clinic promotes giving high-quality care to patients	0.8	6.7	16.7	54.2	21.7
We are actively doing things to improve patient safety	0.2	3.0	10.3	58.3	28.2
Our clinic studies patients' complaints to identify patterns and prevent the same problems from recurring	0.8	10.9	23.4	45.7	19.2
When we experience a problem in the practice, we make a serious effort to figure out what's really going on	1.7	8.5	17.2	52.7	20.0
My clinic sends me reports on the quality of care I provide to my patients	7.5	26.9	26.7	28.4	10.5
Most people in this practice are willing to change how they do things in response to feedback from others	1.8	7.5	19.0	55.7	16.0
Providers and staff in the clinic are provided with adequate release time from their regular job duties for quality improvement activities	10.3	28.2	28.7	25.6	7.2
I am rewarded for the work I do in quality improvement	14.0	23.8	33.5	23.0	5.6
Work Environment Covariate (mean [SD] score, 68 [10]; α = .85)					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
People in this clinic operate as a team	1.7	9.8	17.0	53.7	17.8
Leadership creates an environment where things can be accomplished	4.0	14.3	21.8	45.9	14.0
Leadership promotes an environment that is an enjoyable place to work	4.2	11.0	27.2	41.9	15.7
Candid and open communication exists between physicians and other staff	3.3	10.2	18.2	50.3	18.0
The work I do is appropriate for my role and training	1.0	4.8	9.3	55.2	29.7
I typically have adequate control over					
My clinic schedule	5.2	15.5	18.6	47.7	13.0
Work interruptions	10.0	23.9	21.0	37.0	8.1
Volume of my patient load	9.7	20.3	25.9	36.2	7.9

Abbreviations: EMR, electronic medical record; PCMH, patient-centered medical home.

[a] The survey questions were mapped to the domains of the 2008 National Committee for Quality Assurance PCMH standards and were then consolidated into 5 subscales based on content validity. Each question was scored from 0 to 100 (worst to best), and the subscale scores are the means of these rescaled questions. The mean (SD) total PCMH score was 64 (7) (α = .87), calculated as the mean of 4 of 5 subscale scores (excluding communication with other providers subscale).

[b] The exact wording of some survey questions was changed slightly for brevity.

[c] Due to rounding, data do not sum to 100%.

[d] Included only responses from providers.

[e] Included only responses for clinics that have EMRs.

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

Table 4. Univariate Correlates of Provider and Staff Morale, Job Satisfaction, and Burnout[a]

	Odds Ratio (95% CI)					
	Provider			Staff		
Variable	Morale	Job Satisfaction	Burnout	Morale[b]	Job Satisfaction	Burnout
Access to care and communication with patients subscale	1.77 (1.19-2.62)[c]	1.59 (1.21-2.09)[d]	1.05 (0.82-1.34)	2.23 (1.50-3.31)[d]	1.54 (1.18-2.01)[c]	1.07 (0.84-1.37)
Tracking data subscale	1.13 (0.83-1.54)	0.90 (0.70-1.14)	0.83 (0.69-1.01)[e]	1.11 (0.83-1.48)	0.87 (0.69-1.11)	0.85 (0.70-1.03)[e]
Care management subscale	1.43 (0.94-2.18)[e]	1.10 (0.81-1.48)	0.91 (0.71-1.17)	1.74 (1.20-2.53)[c]	1.07 (0.80-1.43)	0.93 (0.73-1.19)
Quality improvement subscale	2.51 (1.66-3.79)[d]	1.80 (1.34-2.42)[d]	1.12 (0.85-1.47)	3.39 (2.19-5.24)[d]	1.75 (1.30-2.35)[d]	1.14 (0.87-1.51)
Work environment covariate	2.14 (1.59-2.86)[d]	1.75 (1.41-2.16)[d]	1.19 (0.97-1.46)[e]	2.94 (2.10-4.12)[d]	1.70 (1.38-2.11)[d]	1.21 (0.98-1.49)[e]
Total PCMH score	2.03 (1.24-3.32)[c]	1.32 (0.93-1.87)	0.91 (0.68-1.23)	2.37 (1.50-3.75)[d]	1.28 (0.91-1.81)	0.93 (0.69-1.25)

Abbreviation: PCMH, patient-centered medical home.

[a] Odds ratios (95% CIs) are reported from univariate generalized estimating equation logistic regression analyses. Odds ratios indicate how much a 10% increase in the PCMH subscale score, total PCMH score, or covariate score increases the odds that providers and staff rated their workplace morale highly, were satisfied with their job, or had less burnout.

[b] Cut points for morale, job satisfaction, and burnout are as follows: For morale, "poor" and "fair" were combined vs "good," "very good," and "excellent." For job satisfaction, "strongly disagree," "disagree," and "neither agree nor disagree" were combined vs "agree" and "strongly agree." For burnout, "I feel completely burned out and often wonder if I can go on," "The symptoms of burnout that I'm experiencing won't go away. I think about frustrations at work a lot," and "I have one or more symptoms of burnout, such as physical or emotional exhaustion" were combined vs "Occasionally I am under stress at work, but I don't feel burned out" and "I enjoy my work. I have no symptoms of burnout."

[c] $P < .01$.

[d] $P < .001$.

[e] $P > .05$ and $< .10$.

In the multivariate models using the total PCMH score and control variables that excluded work environment, higher total PCMH score correlated with higher staff morale but with less provider freedom from burnout. When work environment was added to the model, the total PCMH score no longer correlated with morale. For providers, a higher total PCMH score was associated with lower job satisfaction and with reduced freedom from burnout.

COMMENT

Our survey of providers and clinical staff at safety net clinics demonstrated that perceptions of PCMH capability were associated on univariate analysis with whether they had higher morale and greater job satisfaction. Specifically, access to care and communication with patients subscale scores and quality improvement subscale scores were associated with better morale and job satisfaction for both providers and staff, and care management subscale scores were associated with better morale for staff. On multivariate analysis of the PCMH subscale scores without the work environment covariate, the quality improvement subscale score was the most consistent independent correlate. The quality improvement subscale includes survey questions on commitment to quality and patient safety, collection of quality data, and willingness of providers and staff to change. These factors may support interventions and culture that improve MSB. In multivariate models without the work environment covariate, the total PCMH score was associated with higher staff morale and tended to correlate with higher provider morale and greater staff job satisfaction. However, the total PCMH score negatively correlated with provider freedom from burnout. Although the findings herein are positive overall, it is important to monitor for increased provider burnout that may result from the work and stress of PCMH implementation and maintenance.

When work environment was added to the models, the associations of PCMH subscale scores with morale and job satisfaction largely disappeared. However, we found that work environment highly correlated with PCMH characteristics, particularly the quality improvement subscale score and the total PCMH score. Work environment has been widely recognized as affecting MSB.[7-9] Our measurement of work environment included survey questions on teamwork, supportive leadership, and autonomy. Our univariate and multivariate analyses without work environment showed that the presence of PCMH characteristics likely correlates with higher morale and job satisfaction. However, it may be that PCMH characteristics influence the work environment or that a good work environment greatly facilitates the development of strong PCMH characteristics.

Our study has several limitations. First, a baseline cross-sectional study can show correlations but cannot prove causation. Similarly, it is difficult to determine the exact relationships among PCMH characteristics, work environment, and MSB. Second, we cannot generalize our findings to all safety net clinics because the study clinics were not randomly sampled. Study clinics may have higher mo-

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

Table 5. Multivariate Correlates of Provider and Staff Morale, Job Satisfaction, and Burnout[a]

	Odds Ratio (95% CI)					
	Provider			Staff		
Variable	Morale	Job Satisfaction	Burnout	Morale[b]	Job Satisfaction	Burnout
Models Without Work Environment – PCMH Subscales						
Access and communication with patients	1.06 (0.63-1.81)	0.86 (0.52-1.43)	0.76 (0.47-1.23)	2.07 (1.13-3.81)[c]	1.54 (0.92-2.60)	1.09 (0.64-1.84)
Tracking data	0.98 (0.65-1.48)	0.77 (0.51-1.17)	0.92 (0.63-1.34)	0.72 (0.45-1.17)	0.92 (0.59-1.43)	0.94 (0.61-1.45)
Care management	0.69 (0.36-1.32)	0.73 (0.38-1.42)	0.69 (0.38-1.26)	0.88 (0.46-1.68)	0.66 (0.37-1.16)	0.68 (0.38-1.20)
Quality improvement	2.64 (1.47-4.75)[d]	2.45 (1.42-4.23)[d]	1.01 (0.61-1.67)	3.62 (1.84-7.09)[d]	2.55 (1.42-4.57)[e]	2.32 (1.31-4.12)[e]
Models Without Work Environment – Total PCMH Score						
Total PCMH score	1.64 (0.95-2.81)[f]	1.04 (0.62-1.76)	0.48 (0.30-0.77)[e]	2.63 (1.47-4.71)[d]	1.63 (0.99-2.67)[f]	1.26 (0.80-1.99)
Models With Work Environment – PCMH Subscales						
Access and communication with patients	0.99 (0.60-1.63)	0.85 (0.52-1.41)	0.74 (0.46-1.21)	1.78 (1.00-3.17)[c]	1.42 (0.84-2.38)	1.13 (0.67-1.93)
Tracking data	0.92 (0.62-1.37)	0.73 (0.48-1.12)	0.92 (0.62-1.35)	0.64 (0.40-1.03)[f]	0.87 (0.56-1.36)	0.92 (0.60-1.42)
Care management	0.67 (0.36-1.26)	0.72 (0.37-1.40)	0.64 (0.34-1.18)	1.02 (0.56-1.88)	0.74 (0.41-1.31)	0.68 (0.38-1.21)
Quality improvement	1.19 (0.55-2.54)	1.69 (0.80-3.56)	0.63 (0.30-1.30)	1.66 (0.71-3.87)	1.75 (0.80-3.81)	2.50 (1.12-5.57)[c]
Work environment	2.29 (1.31-3.97)[e]	1.45 (0.85-2.47)	1.59 (0.95-2.69)[f]	2.43 (1.29-4.59)[e]	1.50 (0.84-2.68)	0.91 (0.52-1.62)
Models With Work Environment – Total PCMH Score						
Total PCMH score	0.66 (0.34-1.26)	0.49 (0.24-0.99)[c]	0.33 (0.18-0.62)[d]	0.97 (0.52-1.82)	0.87 (0.48-1.57)	0.88 (0.50-1.54)
Work environment	2.51 (1.62-3.90)[d]	2.03 (1.30-3.17)[e]	1.43 (0.97-2.12)[f]	3.34 (2.02-5.54)[d]	2.20 (1.39-3.48)[d]	1.55 (1.01-2.36)[c]

Abbreviation: PCMH, patient-centered medical home.

[a] Odds ratios (95% CIs) are reported from multivariate generalized estimating equation logistic regression analyses. Odds ratios indicate how much a 10% increase in the PCMH subscale or covariate score increases the odds that providers and staff rated their workplace morale highly, were satisfied with their job, or had less burnout. In addition to the PCMH scores and work environment covariate (when listed), all multivariate models contained covariates on the presence of an electronic medical record, provider shortage, nursing shortage, and years since the end of clinical training. For each set of PCMH scores and covariates, we fit 3 multivariate models, one for each outcome of morale, job satisfaction, and burnout.

[b] Cut points for morale, job satisfaction, and burnout are as follows: For morale, "poor" and "fair" were combined vs "good," "very good," and "excellent." For job satisfaction, "strongly disagree," "disagree," and "neither agree nor disagree" were combined vs "agree" and "strongly agree." For burnout, "I feel completely burned out and often wonder if I can go on," "The symptoms of burnout that I'm experiencing won't go away. I think about frustrations at work a lot," and "I have one or more symptoms of burnout, such as physical or emotional exhaustion" were combined vs "Occasionally I am under stress at work, but I don't feel burned out" and "I enjoy my work. I have no symptoms of burnout."

[c] $P < .05$.

[d] $P < .001$.

[e] $P < .01$.

[f] $P > .05$ and $< .10$.

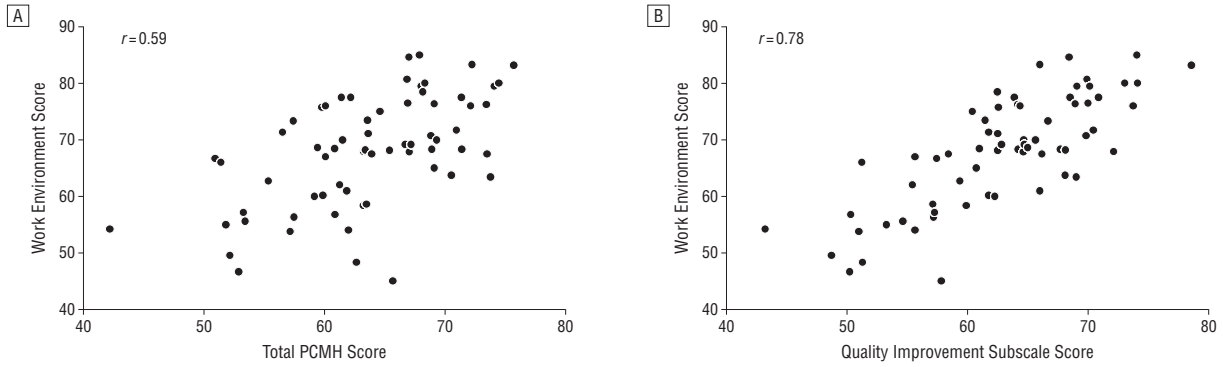

Figure. Correlation of work environment score with patient-centered medical home (PCMH) and quality improvement scores at 65 clinics. A, Work environment score vs total PCMH score (r=0.59). B, Work environment score vs quality improvement subscale score (r=0.78).

tivation and greater capacity for increasing PCMH capability. Third, the evaluation occurred during the early months of the intervention rather than at absolute baseline, but few effects were likely perceived yet by the frontline providers and staff. Fourth, although our response rate of 78.0% is high for provider and staff surveys,[28] response bias is possible. Fifth, we created our survey in 2009 based on the 2008 National Committee for Qual-

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

ity Assurance PCMH standards, which do not reflect the 2011 standards.[19,28] However, the standards are reasonably similar for the purposes of this evaluation of staff MSB. Sixth, we had limited information on EMR capability. Seventh, our findings represent the perceptions of providers and staff rather than objective criteria. However, perceptions of MSB are probably the most appropriate measures of these constructs. Similarly, provider and staff perceptions of their clinic's PCMH characteristics are critically important for implementation and sustainability of the PCMH model.

Overall, our study shows that the PCMH model may be promising for improving provider and staff morale and job satisfaction but indicates that provider burnout must be monitored. The PCMH models may be helpful for improving provider and staff satisfaction, increasing the primary care workforce, and reducing turnover. Patient perceptions of the PCMH model are also important, and we are surveying patients about their impressions. However, provider and staff perceptions of the PCMH are critical in their own right. Longitudinal studies of interventions to improve PCMH capacity will enable us to determine whether implementation of the PCMH can truly improve these vital provider and staff outcomes.

Accepted for Publication: September 12, 2011.
Correspondence: Sarah E. Lewis, MSPH, Department of Health Policy and Management, The Gillings School of Global Public Health, The University of North Carolina at Chapel Hill, 1101 McGavran-Greenberg Hall, Chapel Hill, NC 27599 (slewis7@live.unc.edu).
Author Contributions: Ms Lewis and Mr Nocon made equal contributions to the research. *Study concept and design:* Lewis, Nocon, Tang, Vable, Casalino, Quinn, Burnet, Summerfelt, Birnberg, and Chin. *Acquisition of data:* Lewis, Nocon, Vable, Burnet, and Summerfelt. *Analysis and interpretation of data:* Lewis, Nocon, Tang, Young Park, Vable, Casalino, Huang, Quinn, Burnet, Summerfelt, Birnberg, and Chin. *Drafting of the manuscript:* Lewis, Nocon, Tang, Young Park, Quinn, and Chin. *Critical revision of the manuscript for important intellectual content:* Lewis, Nocon, Tang, Young Park, Vable, Casalino, Huang, Quinn, Burnet, Summerfelt, Birnberg, and Chin. *Statistical analysis:* Lewis, Nocon, Tang, Young Park, and Quinn. *Obtained funding:* Chin. *Administrative, technical, and material support:* Lewis, Nocon, Vable, Quinn, Burnet, and Summerfelt. *Study supervision:* Lewis, Casalino, Huang, Birnberg, and Chin.
Financial Disclosure: None reported.
Funding/Support: This study was supported by The Commonwealth Fund. Dr Birnberg was supported by Postdoctoral Fellowship in Health Services Research award T32-5T32 HS00084-12 from the Agency for Healthcare Research and Quality. Dr Chin is supported by Midcareer Investigator Award in Patient-Oriented Research K24 DK071933 from the National Institute of Diabetes and Digestive and Kidney Diseases and by grants P60 DK20595 and P30 DK092949 from the National Institute of Diabetes and Digestive and Kidney Diseases Diabetes Research and Training Center and Chicago Center for Diabetes Translation Research.
Disclaimer: The views presented herein are those of the authors and do not necessarily represent those of The Commonwealth Fund, its directors, officers, or staff.
Previous Presentations: This study was presented in part at the Safety Net Medical Home Initiative; March 8, 2011; Boston, Massachusetts; at the 34th Annual Meeting of the Society of General Internal Medicine; May 6, 2011; Phoenix, Arizona; at the 2011 Annual Research Meeting of AcademyHealth; June 13, 2011; Seattle, Washington; and at the Midwest region meeting of the Society of General Internal Medicine; September 16, 2011; Chicago, Illinois.

REFERENCES

1. American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. American College of Physicians Web site. Joint principles of a patient-centered medical home released by organizations representing more than 300,000 physicians. March 5, 2007. http://www.acponline.org/pressroom/pcmh.htm. Accessed March 1, 2011.
2. National Committee for Quality Assurance. Patient-centered medical home. http://www.ncqa.org/tabid/631/Default.aspx. Accessed August 1, 2011.
3. Nutting PA, Crabtree BF, Miller WL, Stewart EE, Stange KC, Jaén CR. Journey to the patient-centered medical home: a qualitative analysis of the experiences of practices in the National Demonstration Project [published correction appears in *Ann Fam Med.* 2010;8(4):369]. *Ann Fam Med.* 2010;8(suppl 1):S45-S56, S92.
4. Hayashi AS, Selia E, McDonnell K. Stress and provider retention in underserved communities. *J Health Care Poor Underserved.* 2009;20(3):597-604.
5. Rosenblatt RA, Andrilla CHA, Curtin T, Hart LG. Shortages of medical personnel at community health centers: implications for planned expansion. *JAMA.* 2006; 295(9):1042-1049.
6. Centers for Medicare & Medicaid Services. Details for Federally Qualified Health Center Advanced Primary Care Practice Demonstration. November 10, 2010. http://www.cms.gov/demoprojectsevalrpts/md/itemdetail.asp?itemid=CMS1230557. Accessed March 1, 2011.
7. Linzer M, Manwell LB, Williams ES, et al; MEMO (Minimizing Error, Maximizing Outcome) Investigators. Working conditions in primary care: physician reactions and care quality. *Ann Intern Med.* 2009;151(1):28-36, W6-W9.
8. Williams ES, Konrad TR, Linzer M, et al; SGIM Career Satisfaction Study Group. Physician, practice, and patient characteristics related to primary care physician physical and mental health: results from the Physician Worklife Study. *Health Serv Res.* 2002;37(1):121-143.
9. Scheurer D, McKean S, Miller J, Wetterneck T. U.S. physician satisfaction: a systematic review. *J Hosp Med.* 2009;4(9):560-568.
10. Zangaro GA, Soeken KL. A meta-analysis of studies of nurses' job satisfaction. *Res Nurs Health.* 2007;30(4):445-458.
11. Quinn MA, Wilcox A, Orav EJ, Bates DW, Simon SR. The relationship between perceived practice quality and quality improvement activities and physician practice dissatisfaction, professional isolation, and work-life stress. *Med Care.* 2009; 47(8):924-928.
12. Graber JE, Huang ES, Drum ML, et al. Predicting changes in staff morale and burnout at community health centers participating in the Health Disparities Collaboratives. *Health Serv Res.* 2008;43(4):1403-1423.
13. Marsteller JA, Hsu YJ, Reider L, et al. Physician satisfaction with chronic care processes: a cluster-randomized trial of guided care. *Ann Fam Med.* 2010; 8(4):308-315.
14. Leibowitz R, Day S, Dunt D. A systematic review of the effect of different models of after-hours primary medical care services on clinical outcome, medical workload, and patient and GP satisfaction. *Fam Pract.* 2003;20(3):311-317.
15. Belardi FG, Weir S, Craig FW. A controlled trial of an advanced access appointment system in a residency family medicine center. *Fam Med.* 2004;36(5): 341-345.
16. Thind A, Freeman T, Thorpe C, Burt A, Stewart M. Family physicians' satisfaction with current practice: what is the role of their interactions with specialists? *Healthc Policy.* 2009;4(3):e145-e158. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2653706/?tool=pubmed. Accessed October 9, 2011.
17. Reid RJ, Coleman K, Johnson EA, et al. The Group Health medical home at year two: cost savings, higher patient satisfaction, and less burnout for providers. *Health Aff (Millwood).* 2010;29(5):835-843.
18. Qualis Health Web site. Safety Net Medical Home Initiative: change concepts.

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013

April 2010. http://www.qhmedicalhome.org/safety-net/upload/Change-Concepts-Sequenced-Final-4_12_10.pdf. Accessed March 1, 2011.
19. National Committee for Quality Assurance. PCMH standards & guidelines. http://www.ncqa.org/tabid/1016/Default.aspx. Accessed August 1, 2011.
20. Nutting PA, Miller WL, Crabtree BF, Jaen CR, Stewart EE, Stange KC. Initial lessons from the first National Demonstration Project on practice transformation to a patient-centered medical home. *Ann Fam Med*. 2009;7(3):254-260.
21. Reid RJ, Fishman PA, Yu O, et al. Patient-centered medical home demonstration: a prospective, quasi-experimental, before and after evaluation. *Am J Manag Care*. 2009;15(9):e71-e87. http://www.ajmc.com/publications////AJMC_09sep_ReidWEbX_e71toe87/. Accessed October 12, 2011.
22. Menachemi N, Powers TL, Brooks RG. The role of information technology usage in physician practice satisfaction. *Health Care Manage Rev*. 2009;34(4):364-371.
23. Birnberg JM, Drum ML, Huang ES, et al. Development of a Safety Net Medical Home Scale for health centers [published online ahead of print August 12, 2011]. *J Gen Intern Med*. 2011. doi:10.1007/s11606-011-1767-9.
24. Rohland BM, Kruse GR, Rohrer JE. Validation of a single-item measure of burnout against the Maslach Burnout Inventory among physicians. *Stress Health*. 2004;20(2):75-79.
25. Smith CS, Morris M, Hill W, et al. Testing the exportability of a tool for detecting operational problems in VA teaching clinics. *J Gen Intern Med*. 2006;21(2):152-157.
26. O'Malley AJ, Landon BE, Guadagnoli E. Analyzing multiple informant data from an evaluation of the Health Disparities Collaboratives. *Health Serv Res*. 2007;42(1, pt 1):146-164.
27. Greene WH. *Econometric Analysis*. 3rd ed. Upper Saddle River, NJ: Prentice Hall; 1997:339-350.
28. Asch DA, Jedrziewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol*. 1997;50(10):1129-1136.

INVITED COMMENTARY

The Potential Impact of the Medical Home on Job Satisfaction in Primary Care

There are good reasons to improve job satisfaction in primary care. First, patient access to primary care services is suboptimal. Patients report greater difficulty finding new primary care physicians (PCPs) than finding new specialists, and increasing the supply of PCPs is one potential solution to this problem.[1] If PCP job satisfaction improves, it seems logical that trainees who notice this improvement will be more likely to enter primary care careers. In addition, PCPs who are more satisfied with their jobs may be less likely to cut their hours, leave primary care for other medical fields, or quit medicine altogether.[2,3]

Second, PCPs who enjoy greater job satisfaction may provide better patient care. This idea has intuitive appeal, and cross-sectional studies have linked greater PCP job satisfaction to better patient satisfaction,[4] greater adherence to treatment,[5] and quality improvement activities in physician practices.[6,7] However, greater PCP job satisfaction has not been associated consistently with better performance on technical quality measures,[7] and the direction of causation is unclear. Greater PCP job satisfaction may be an unintended but beneficial consequence of quality improvement activities, even if technical quality does not improve.

Third, improving PCP job satisfaction is an inherently worthy goal, especially if you ask PCPs. However, efforts that target PCP satisfaction without also promising some kind of benefit to patients (eg, better access, quality, or efficiency of care) seem unlikely to attract broad support. Therefore, it should be no surprise if interventions that might improve job satisfaction in primary care have additional, more prominently featured goals.

The enormously popular medical home movement, which advocates expanding the capabilities of primary care practices, aims to produce higher quality of care, better health outcomes, superior patient experience, lower costs of care (or at least slower growth in costs), and, finally, greater job satisfaction in primary care. Will the medical home succeed in improving job satisfaction while achieving these first 3 goals? With dozens of pilot studies under way, it is too early to tell, but early reports from medical home pilot studies have presented both hopeful and cautionary results.

In this issue of the *Archives*, Lewis et al[8] present results from a baseline survey of providers and staff participating in the ongoing Safety Net Medical Home Initiative. As in previous cross-sectional analyses of physician job satisfaction in primary care,[7] greater *provider* job satisfaction and morale (but not freedom from burnout) were associated with clinics' quality improvement activities and with a "work environment" score that combined items measuring teamwork, facilitative leadership, communication, and control over one's work. Expanding the usual scope of primary care job satisfaction, Lewis et al[8] also find that the same factors are associated with clinic *staff* satisfaction, morale, and (unlike providers) greater freedom from burnout. Together, these findings suggest that medical homes will have high levels of primary care job satisfaction if they are geared toward quality and feature excellent teamwork, leadership, communication, and work control.

Unfortunately, we cannot assume that medical home *interventions* will successfully introduce satisfaction-producing features into practices that currently lack them. These features (culture, leadership, relationships, and work processes) reflect fundamental characteristics of a practice, and changing them can be difficult, especially on a short time line. For example, the 2-year National Demonstration Project (NDP) of the American Academy of Family Physicians[9] directly targeted these characteristics for transformation. Job satisfaction was not quantitatively assessed, but NDP evaluators found that

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 05/24/2013