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Patient-Centered Medical Home Initiative Produced Modest Economic Results For Veterans Health Administration, 2010-12

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ABSTRACT In 2010 the Veterans Health Administration (VHA) began a nationwide initiative called Patient Aligned Care Teams (PACT) that reorganized care at all VHA primary care clinics in accordance with the patient-centered medical home model. We analyzed data for fiscal years 2003–12 to assess how trends in health care use and costs changed after the implementation of PACT. We found that PACT was associated with modest increases in primary care visits and with modest decreases in both hospitalizations for ambulatory care-sensitive conditions and outpatient visits with mental health specialists. We estimated that these changes avoided \$596 million in costs, compared to the investment in PACT of \$774 million, for a potential net loss of \$178 million in the study period. Although PACT has not generated a positive return, it is still maturing, and trends in costs and use are favorable. Adopting patient-centered care does not appear to have been a major financial risk for the VHA.

The Veterans Health Administration (VHA) invested nearly \$2 billion during fiscal years 2010–12 in its effort to transform how it delivers health care.¹ This effort had several components, but its centerpiece—and the component that is the most well developed—is the Patient Aligned Care Teams (PACT) initiative. The goal of the initiative is to transform primary care in a manner consistent with the patient-centered medical home model.²

PACT began in April 2010 and is by far the most extensive implementation of that model to date in either the government or the private sector.^{3–5} PACT involved all VHA outpatient primary care clinics—including all major medical centers and small community-based clinics—which collectively treat over five million primary care patients annually. We evaluated the associations between the implementation of PACT and trends in health care use and costs between April 2010

and September 2012. We used the resulting data to estimate the return on investment in PACT.

Study Data And Methods

THE PACT INITIATIVE Consistent with the patient-centered medical home model, the goals of PACT are to provide primary care that is more comprehensive, longitudinal, and patient centered.² The initiative has several interdependent components: the establishment of team-based care, increased access to same-day care, improved care management and coordination, and increased focus on patient-centered care.

Primary care providers at the VHA include physicians and nurse practitioners. Before the implementation of PACT, primary care providers worked in large groups that shared nurses and other staff members. Under PACT, each primary care provider became the leader of a team that also includes a registered nurse care manager, a

medical assistant, and an administrative clerk.⁵ Additional support staff were hired to meet these goals.

Each team that is led by a physician is responsible for the care of approximately 1,200 patients; each team led by a nurse practitioner cares for about 900 patients. Expectations for panel size per primary care provider did not change under PACT. However, the number of support staff per provider increased from 2.3 full-time-equivalent positions in April 2010 to 3.0 in December 2011.⁶

PACT teams facilitate patients' access to same-day care by scrubbing next-day appointments of follow-up visits that were obviated by improvements in the patient's condition. When clinically feasible, the teams substitute telephone calls and secured messaging for face-to-face visits with patients.

Care management and coordination were enhanced through the hiring of 1,271 additional registered nurse care managers. Each of these care managers was assigned to a PACT team and made responsible for facilitating chronic disease care management and patient care transitions. The PACT initiative also included the hiring at each facility of one full-time health promotion specialist and one full-time health behavior coordinator, both of whom work across teams to address population health issues and coordinate screening programs.

Mental health is another important component of the initiative.⁷ PACT builds on an initiative to integrate primary care and mental health that started in 2007. The integration includes locating behavioral health professionals in primary care facilities. These professionals work across PACT teams to promptly address issues related to common mental health conditions, such as depression, post-traumatic stress disorder, and substance use disorders.⁸ Funding for the integration initiative has been incorporated into the baseline budget for primary care: There were no new funds for the integration during the implementation of PACT.

Finally, PACT stresses patient-centeredness through a broad variety of educational and training activities.⁹

DATA AND SUBJECTS Data for this study were derived from VHA administrative databases for fiscal years (FY) 2003–12 (October 2002–September 2012). We identified unique patients enrolled in primary care at 908 primary care clinics, which represented nearly all veterans receiving primary care services in a VHA medical center or community clinic. Community clinics generally have a small number of primary care providers (a median of three, compared to twenty-seven at VHA medical centers), provide no specialty care,

and are often located in rural areas.

We obtained utilization measures and patient demographic variables and mortality data from the VHA Corporate Data Warehouse. In addition, we obtained *International Classification of Diseases, Ninth Revision (ICD-9)*, diagnosis codes for all inpatient and outpatient visits and used them to adjust for comorbidity using the methods of Anne Elixhauser.¹⁰

OUTCOME MEASURES To estimate return on investment, we modeled trends for eight categories of health care use in the VHA that we hypothesized would be most sensitive to the implementation of PACT. There were three categories of face-to-face outpatient encounters: primary care, specialty mental health, and major specialty clinic (for example, cardiology clinic) and specialty procedure-based visits (such as to a colonoscopy clinic); three categories of hospitalizations: medical, mental health, and ambulatory care-sensitive conditions (such as heart failure, angina, and pneumonia); and two other types of visits: to the emergency department (ED) and to urgent care clinics.

Encounter-level data from administrative data sets were used to categorize outpatient visits based on the clinic where the service was provided. To determine the reason for a hospital stay, we used the primary diagnosis code in computerized inpatient records.

We measured trends in outpatient visits and hospitalizations at each VHA facility for each quarter for fiscal years 2003–12. For each utilization category, we calculated facility-level utilization as the total number of face-to-face visits for patients assigned to a primary care provider at that facility, regardless of whether the visit occurred at the patient's assigned facility or another VHA facility.

We constructed facility-level utilization measures separately for patients younger than sixty-five and for those ages sixty-five and older, to account for differences in VHA utilization because of eligibility for Medicare. In both age groups, the final study sample consisted of the same 908 clinics.

ESTIMATING THE EFFECT OF PACT ON UTILIZATION We modeled trends in the utilization categories at the facility level for fiscal years 2003–12 using mixed-effects Poisson models.¹¹ We estimated the extent to which those long-run trends changed in the period April 2010–September 2012, after PACT was implemented.

For categories of outpatient utilization, we estimated fixed effects for a linear trend before PACT and a change in both the intercept and the trend after PACT. For categories of inpatient utilization, we did not estimate a change in the post-PACT time trend because of substantial in-

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stability in these estimates. Specifically, hospitalizations were less common events than outpatient visits, especially for our younger cohort, and the post-PACT slopes were sensitive to the level of hospitalizations in the first and last quarters of the post-PACT period.

We included facility-level random components to the intercept and to the pre-PACT and post-PACT trends to allow for facility-specific effects of PACT. To test for structural change in utilization trends, we performed a Wald test, assessing whether the pre-PACT and post-PACT fixed effect estimates were equal.¹² Rejection of the null hypothesis was evidence of a significant PACT effect.

All regression models adjusted for facility-level mean patient characteristics in a given quarter (mean age; percentage male, white, African American, and requiring no copayments; and average patient risk); unemployment rate in each clinic's labor-market area; quarterly dummy variables to capture seasonal variation; and a linear time trend.

Patient risk was measured using average facility-level Elixhauser comorbidity scores.¹⁰ First, we constructed patient-level Elixhauser scores by determining whether or not patients had each of the thirty conditions specified by Elixhauser, using ICD-9 codes for care obtained in the previous year. Next, we counted the number of conditions to calculate a composite patient score. We then averaged patient scores within a facility to produce an overall facility-level score for each quarter.

Regression models also included the number of primary care providers as a covariate, to account for interfacility variation in clinician workload that could affect utilization. The log of the total number of primary care patients at each facility was used as the exposure-offset variable, which accounts for the fact that facilities with more patients have more opportunities for health care use.

Standard errors were heteroscedastic robust. A *p* value of 0.05 was used to assess all statistical significance.

For utilization categories for which the effect of PACT was significant, we calculated two predicted utilization trends for the post-PACT period: one with the coefficients on post-PACT variables (that is, the change in the intercept and trend in the post-PACT period) set to their estimated values, and one with these parameters set to zero. The latter trend represents an estimate of what utilization would have been if PACT had not been implemented—in other words, if the pre-PACT trends had persisted post-PACT.

For each set of parameters, we then aggregated visits across all facilities to yield estimates of

The estimated cost savings of PACT were due mainly to reduced specialty mental health visits.

utilization across the VHA for each scenario. The difference between the two predicted trends of utilization for each quarter after April 2010 was the effect of PACT.

ESTIMATING THE EFFECT OF PACT ON COSTS We multiplied changes in use by estimates of unit costs. In a system with a fixed total budget, such as the VHA, any savings in certain categories of health care use would be shifted to other cost centers in the facility, thus obscuring the presence of those savings.

To correct for this budgeting artifact, we first constructed a univariate time series of unit cost for each utilization category during the pre-PACT period. Then we regressed these unit costs on the Consumer Price Index for medicine and used these relationships to forecast quarterly unit prices for the post-PACT period. This gave us estimates of what the unit cost would have been if no investment in PACT had occurred.

We multiplied these unit costs by differences in utilization between the scenarios with PACT and without it to derive the cost implications of PACT. We did this only for categories of use in which there was a statistically significant change after the implementation of PACT.

To estimate the return on investment, we subtracted the difference in costs between the scenarios with PACT and without it from the investment in the initiative. We used a 4 percent annual discount rate to derive a discounted net cash flow.

LIMITATIONS The null findings for certain utilization categories deserve to be noted. Previous studies⁵ have observed reductions in visits to the ED and urgent care clinics after the implementation of a patient-centered medical home, but we did not observe this effect within the VHA. This is likely because of the unique characteristics of VHA emergency care, which is provided at only 111 of the 908 VHA sites of care included in our study. Many VHA patients use non-VHA emergency care that is paid for by the VHA. However, claims for these non-VHA visits through FY 2012 are incomplete, so they could not be includ-

ed in our analysis.

In addition, some urgent care clinics and EDs suspended operations for a period of time in the pre-PACT period, so ED and urgent care visits to those facilities decreased to zero for a while and then increased again. This made it difficult to establish a pre-PACT trend, as required by the interrupted time-series model. Only thirty-seven facilities with an ED (out of the 111 facilities that had an ED at some time during the study period) had sufficient data to contribute to our models.

Similarly, the irregular coding of telephone encounters in the pre-PACT period prevented us from using interrupted time-series models to address the effects of PACT on visits that were not face-to-face. Future studies that have shorter time horizons would not suffer from this limitation. Such studies may be a better way to test the effects of PACT on emergency and urgent care visits and visits that were not face-to-face.

Future research should also address the question of whether the decrease that we estimated in specialty mental health visits represented a gain in efficiency or a reduction in the provision of a needed health service. The present study was not designed to investigate this point.

We did not include the effects of PACT on services covered by Medicare for eligible VHA beneficiaries, or the effects on services for which the VHA has limited resources (for example, mammography, dialysis, and colonoscopy) and therefore contracts with external providers, because of the time lag in receiving information on these services. It is possible that the implementation of PACT created spillovers to non-VHA providers that were not captured in our analysis.

The results of interrupted time-series analyses can be confounded by other contemporaneous policy and environmental changes. In particular, PACT has been the largest component of a broader effort by the VHA to transform its delivery of health care, as noted above. That effort included the expanded use of telemedicine, improvements in the processing of veterans benefits, and improvements in specialty care coordination. Many of these other components were still in the early stages of deployment in our study period, and many concern veterans benefits that are only indirectly related to health care. However, they may have contributed to changes in the use of health care in the period after the implementation of PACT.

The present evaluation is described in relation to the PACT initiative specifically. Nonetheless, the results should also be viewed as the joint effects of all of the components of the VHA's broader effort at transformation, with a specific emphasis on the outcomes that were most sensitive to the PACT initiative.

It is possible that the results we observed could be attributed to the economywide reduction in the rate of growth in health care costs that occurred during the study period, which has been documented in previous studies.^{13,14} However, we believe that this explanation is unlikely for several reasons.

First, the VHA is largely shielded from policy changes in the broader health care market that may be affecting trends in costs. For example, unlike the broader health care market, the VHA has not shifted more of the cost burden to patients,¹⁵ and the VHA has a long-running policy of substituting generic prescription drugs for brand-name ones.¹⁶

Second, the rate of cost growth at the national level declined across many utilization categories.¹⁴ However, most utilization categories at the VHA did not decrease following the implementation of PACT. An economywide factor that caused homogeneous effects on cost trends at the national level is unlikely to have been responsible for the heterogeneous effects on trends in VHA utilization that we found.

Third, and most important, we found no effect of PACT on total hospitalizations. However, hospitalizations for ambulatory care-sensitive conditions decreased, and total primary care visits increased. These observations suggest an effect that was related to PACT instead of an economywide phenomenon.

Finally, what we report were short-term effects. The VHA is a very large and complex system in which large-scale change requires prolonged effort. Implementation of PACT was still progressing during our study period, and a more conclusive analysis must await the initiative's full implementation. Studies are currently under way to determine whether the utilization changes in the post-PACT period are correlated with degrees of implementation at the facility level. Our analysis also does not account for any long-term cost implications of improvements in population health, such as diabetes control, that have been found in other studies of patient-centered medical homes.⁵

Study Results

The study sample consisted of eleven million primary care patients during the study period (Exhibit 1). For the five million patients enrolled in primary care at the beginning of PACT, patients' mean age was 63.5 years, 72.4 percent of patients were white, and 93.6 percent were male. Patients younger than sixty-five were less likely than older patients to be white and to receive care from community clinics.

Exhibit 2 summarizes the estimated effect of

EXHIBIT 1

Demographic Characteristics Of The Study Sample At The Start Of The Patient Aligned Care Teams (PACT) Initiative In The Veterans Health Administration, April 2010

	All ages	Younger than 65	65 and older
Number of patients	4,982,428	2,627,737	2,354,691
Patients from community-based outpatient clinics	51.7%	47.9%	55.9%
Mean age, years (SD)	63.5 (15.7)	51.9 (11.4)	76.5 (7.7)
Male	93.6%	89.6%	98.1%
Race (%)			
White	72.4	58.1	88.4
African American	12.7	16.7	8.3
Other or unknown	14.9	25.2	3.3
Health conditions (%)			
Diabetes	31.5	31.2	31.9
Heart failure	5.0	5.0	5.1
Hypertension	60.1	59.7	60.5
Depression	16.7	16.5	16.9
Alcohol abuse	8.1	8.1	8.2

SOURCE Authors' analysis of administrative data from the Veterans Health Administration. **NOTE** There were 908 facilities.

PACT on the eight measures of utilization that we hypothesized would be sensitive to the initiative. Only three of the effects were statistically significant: Hospitalizations for ambulatory care-sensitive conditions and outpatient visits with mental health specialists decreased significantly after the implementation of PACT, and primary care visits increased significantly, although only among patients ages sixty-five and older.

When we multiplied these utilization changes by unit costs, we estimated that \$639 million in costs was avoided after PACT was implemented (Exhibit 2). If we excluded from the calculation

the statistically insignificant effect of PACT on primary care visits by patients younger than sixty-five, the estimated savings was \$559 million.

Exhibit 3 shows how we derived the effects of the PACT implementation from the mixed-effect Poisson models for one of the utilization categories that changed significantly. The difference between the two estimates for hospitalizations after the implementation of PACT represents the 4.2 percent of hospitalizations for ambulatory care-sensitive conditions that we estimated were avoided because of PACT.

Similar exhibits for specialty mental health

EXHIBIT 2

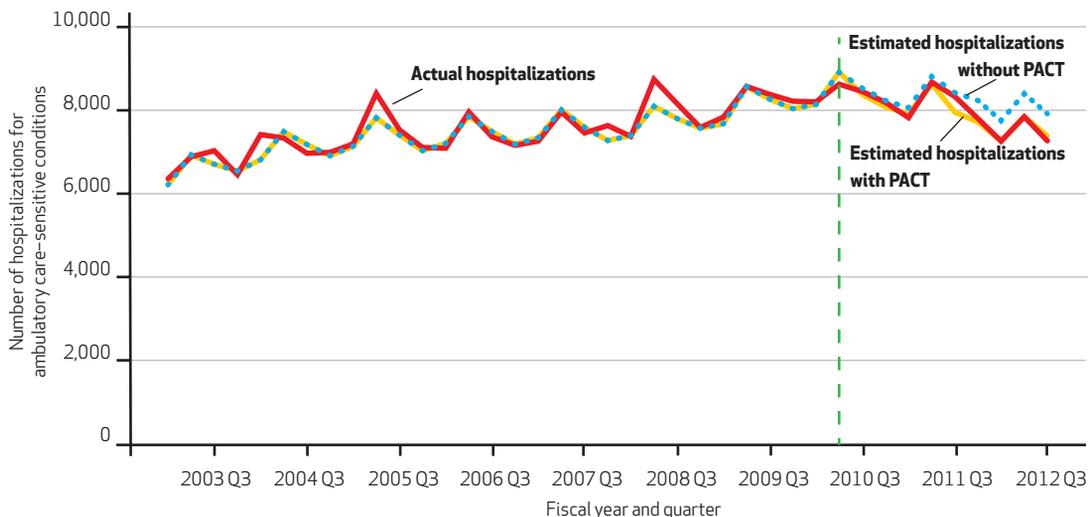
Estimated Effects Of The Patient Aligned Care Teams (PACT) Initiative On Utilization And Costs Of Health Care, Veterans Health Administration, April 2010–September 2012

Type of utilization	Change due to PACT, by patient age group					
	In utilization (%)			In costs (\$ millions)		
	<65	65+	All ages	<65	65+	All ages
Total	— ^a	— ^a	— ^a	−779.8	140.6	−639.3
CATEGORIES OF USE SIGNIFICANTLY AFFECTED BY INITIATIVE						
Hospitalizations for ambulatory care-sensitive conditions	−4.2	−0.2	−1.7	−54.4	−4.1	−58.5
Outpatient primary care visits	−1.2 ^b	3.5	1.0	−80.2	235.3	155.0
Outpatient specialty mental health visits	−7.8	−5.2	−7.3	−645.2	−90.6	−735.8
CATEGORIES OF USE NOT SIGNIFICANTLY AFFECTED BY INITIATIVE						
Outpatient specialty visits to providers in major subspecialties	−2.1	−0.1	−1.2	— ^c	— ^c	— ^c
Urgent care visits	−3.7	2.4	−1.4	— ^c	— ^c	— ^c
ED visits	1.3	2.1	1.6	— ^c	— ^c	— ^c
Hospitalizations for mental health conditions	0.6	−2.2	0.1	— ^c	— ^c	— ^c
Hospitalizations for medical conditions	−1.0	0.7	−0.1	— ^c	— ^c	— ^c

SOURCE Authors' analysis of administrative data from the Veterans Health Administration. **NOTE** ED is emergency department. ^aTotals for utilization are not provided because the totals would include disparate types of utilization (that is, visits and hospitalizations). ^bNot significant ($p < 0.05$). ^cCost effects were estimated only for utilization categories that demonstrated a statistically significant change after the implementation of PACT.

EXHIBIT 3

Hospitalizations For Ambulatory Care–Sensitive Conditions Among Patients Younger Than Age 65, Before And After Implementation Of The Patient Aligned Care Teams (PACT) Initiative In The Veterans Health Administration, By Quarter, 2003–12



SOURCE Authors' analysis of administrative data from the Veterans Health Administration. **NOTE** The vertical line indicates when PACT was implemented.

visits and outpatient visits are in the online Appendix.¹⁷ Across the VHA system, the implementation of PACT was associated with a 1.0 percent increase in primary care visits and a 7.3 percent decrease in specialty mental health visits.

The discounted investment in PACT through FY 2012 was \$774 million (Exhibit 4). The investment was overwhelmingly in hiring new personnel to staff the primary care teams. In addition, approximately \$23 million was spent on training. The investment was offset by an estimated \$596 million in discounted costs of utilization that was avoided because of PACT, for a net loss of \$178 million.

Discussion

After two and a half years, the PACT initiative appears to have had a modest effect on three

categories of utilization within the VHA: Hospitalizations for ambulatory care-sensitive conditions and specialty mental health visits decreased slightly, while outpatient primary care visits by patients ages sixty-five and older increased slightly. The discounted net effect of this change in use was a savings of \$596 million. As explained above, taking the investment in PACT into account, there was a net loss of \$178 million.

These results contribute to a growing body of literature on the effects of the patient-centered medical home on use and costs. The evidence of those effects is mixed. However, this is partly because of the substantial variety of settings and patient populations in which the patient-centered medical home has been studied.^{4,18} Our results are generally in the same range as the modest effects found for patient-centered medical home initiatives such as the Group Health

EXHIBIT 4

Estimated Cash Flow (In Millions Of Dollars) From The Patient Aligned Care Teams (PACT) Initiative, Veterans Health Administration, April 2010–September 2012

	FY 2010	FY 2011	FY 2012	Total	Discounted total
Estimated costs avoided	\$ 96	\$264	\$280	\$639	\$596
PACT investment	258	279	285	822	774
Net loss	-162	-15	-5	-183	-178

SOURCE Authors' analysis of administrative data from the Veterans Health Administration. **NOTES** The discount rate was 4 percent. FY is fiscal year. Net loss is estimated costs avoided minus PACT investment.

Cooperative pilot home^{5,19} and Geisinger's advanced medical home initiative.²⁰ Both of these were conducted in integrated health networks, as was PACT.

We observed a significant decrease in hospitalizations for ambulatory care-sensitive conditions among both age groups in our study—patients who were younger than sixty-five and those who were older. This is consistent with other published evaluations of patient-centered medical homes.^{5,19,20} The fact that we detected the effect in the younger cohort is important because this is the age group and category of utilization in which we would most expect to see a beneficial effect of PACT if one existed. As a result of older patients' Medicare benefits, roughly half of that cohort's utilization occurs outside the VHA.^{21,22}

The estimated cost savings of PACT were due mainly to reduced specialty mental health visits. These savings may have been facilitated by the initiative to integrate primary care and mental health described above.⁸ When mental health care was made more accessible within primary care, the need for PACT teams to refer patients for specialty mental health care may have been reduced. Because the integration initiative predated the PACT initiative, the savings that were related to mental health care may augur well for the future: Additional savings may be realized if, as planned, other components of PACT become equally well integrated into primary care.

We found an increase in primary care visits by patients ages sixty-five and older after the implementation of PACT. This utilization increase may reflect PACT's focus on population health management. For example, PACT nurse care managers engage in telephone counseling of patients with complex chronic conditions.⁹ By reaching out to patients, the initiative's teams may encourage patients who are eligible for Medicare to shift more of their care to the VHA. This represents an increase in visits to the VHA, but it

There was substantial heterogeneity in utilization trends across VHA clinics.

may be cost-neutral overall if these visits replaced visits to providers outside the VHA. We will test this hypothesis when Medicare claims for the period after PACT's implementation become available.

Our study examined changes in utilization attributable to PACT across the VHA overall. However, there was substantial heterogeneity in utilization trends across VHA clinics. Some facilities may be yielding a higher return on investment than others. Ongoing studies are addressing the extent to which the degrees of PACT implementation at the facility level are correlated with changes in utilization.

Conclusion

Our analysis suggests that the PACT initiative has not yielded a positive return on investment. However, the initiative was still in its formative stages during our study period, and trends in use and costs appear to be in a favorable direction. This suggests that an organization's decision to adopt the patient-centered medical home model should be based not upon unrealistic expectations of substantial cost savings but upon expected benefits, such as improved quality of care and high satisfaction with care. Over time, however, there may well be incremental savings. ■

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024). The views expressed herein are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs or other affiliated institutions.

NOTES

- 1 Fihn SD, Tuchschild J. Return on investment for new models of care—preliminary results. 2013 Jan 23. Internal document prepared for Secretary Eric Shinseki, Department of Veterans Affairs.
- 2 Klein S. The Veterans Health Administration: implementing patient-centered medical homes in the nation's largest integrated delivery system [Internet]. New York (NY): Commonwealth Fund; 2011 Sep [cited 2014 Apr 9]. (Case Study). Available from: http://www.commonwealthfund.org/~media/Files/Publications/Case%20Study/2011/Sep/1537_Klein_veterans_hlt_admin_case%20study.pdf
- 3 Crabtree BF, Nutting PA, Miller WL, Stange KC, Stewart EE, Jaén CR. Summary of the National Demonstration Project and recommendations for the patient-centered medical home. *Ann Fam Med*. 2010; 8(Suppl 1):S80–90.
- 4 Hoff T, Weller W, DePuccio M. The patient-centered medical home: a review of recent research. *Med Care Res Rev*. 2012;69(6):619–44.
- 5 Reid RJ, Fishman PA, Yu O, Ross TR, Tufano JT, Soman MP, et al. Patient-centered medical home demonstration: a prospective, quasi-experimental, before and after evaluation. *Am J Manag Care*. 2009; 15(9):e71–87.
- 6 Bodenheimer T, Laing BY. The teamlet model of primary care. *Ann Fam Med*. 2007;5(5):457–61.
- 7 Kearney LK, Post EP, Zeiss A, Goldstein MG, Dundon M. The role of mental and behavioral health in the application of the patient-centered medical home in the Department of Veterans Affairs. *Transl Behav Med*. 2011;1(4):624–8.
- 8 Zivin K, Pfeiffer PN, Szymanski BR, Valenstein M, Post EP, Miller EM, et al. Initiation of primary care-mental health integration programs in the VA health system: associations with psychiatric diagnoses in primary care. *Med Care*. 2010;48(9): 843–51.
- 9 Rosland AM, Nelson K, Sun H, Dolan ED, Maynard C, Bryson C, et al. The patient-centered medical home in the Veterans Health Administration. *Am J Manag Care*. 2012;19(7):e263–72.
- 10 Li B, Evans D, Faris P, Dean S, Quan H. Risk adjustment performance of Charlson and Elixhauser comorbidities in ICD-9 and ICD-10 administrative databases. *BMC Health Serv Res*. 2008;8:12.
- 11 Chandra A, Dalton MA, Holmes J. Large increases in spending on postacute care in Medicare point to the potential for cost savings in these settings. *Health Aff (Millwood)*. 2013;32(5):864–72.
- 12 Davidson R, MacKinnon JG. *Economic theory and methods*. New York (NY): Oxford University Press; 2004.
- 13 Iglehart JK. Are “unsustainable trends” finally coming to a stop? *Health Aff (Millwood)*. 2013; 32(5):830.
- 14 Cuckler GA, Sisko AM, Keehan SP, Smith SD, Madison AJ, Poisal JA, et al. Slow growth until coverage expands and economy improves. *Health Aff (Millwood)*. 2013;32(10): 1820–31.
- 15 Auerbach DI, Kellermann AL. A decade of health care cost growth has wiped out real income gains for an average US family. *Health Aff (Millwood)*. 2011;30(9):1630–6.
- 16 Good CB, Valentine M. Access to affordable medications: the Department of Veterans Affairs pharmacy plan as a national model. *Am J Public Health*. 2007;97(12):2129–31.
- 17 To access the Appendix, click on the Appendix link in the box to the right of the article online.
- 18 Alexander JA, Bae D. Does the patient-centred medical home work? A critical synthesis of research on patient-centred medical homes and patient-related outcomes. *Health Serv Manage Res*. 2012;25(2):51–9.
- 19 Reid RJ, Coleman K, Johnson EA, Fishman PA, Hsu C, Soman MP, 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):835–43.
- 20 Steele GD, Haynes JA, Davis DE, Tomcavage J, Stewart WF, Graf TR, et al. How Geisinger's advanced medical home model argues the case for rapid-cycle innovation. *Health Aff (Millwood)*. 2010;29(11): 2047–53.
- 21 Liu CF, Chapko M, Bryson CL, Burgess JF Jr, Fortney JC, Perkins MW, et al. Use of outpatient care in Veterans Health Administration and Medicare among veterans receiving primary care in community-based and hospital outpatient clinics. *Health Serv Res*. 2010;45(5 Pt 1): 1268–86.
- 22 Hynes DM, Koelling K, Stroupe K, Arnold N, Mallin K, Sohn MW, et al. Veterans' access to and use of Medicare and Veterans Affairs health care. *Med Care*. 2007;45(3):214–23.