Costs for a Health Coaching Intervention for Chronic Care Management

Todd H. Wagner, PhD; Rachel Willard-Grace, MPH; Ellen Chen, MD; Thomas Bodenheimer, MD, MPH; and David H. Thom, MD, PhD, MPH

ABSTRACT

Objectives: Health coaches can help patients gain knowledge, skills, and confidence to manage their chronic conditions. Coaches may be particularly valuable in resource-poor settings, but they are not typically reimbursed by insurance, raising questions about their budgetary impact.

Study Design: The Health Coaching in Primary Care (HCPC) study was a randomized controlled trial that showed health coaches were effective at helping low-income patients improve control of their type 2 diabetes, hypertension, and/or hyperlipidemia at 12 months compared with usual care.

Methods: We estimated the cost of employing 3 health coaches and mapped these costs to participants. We tested whether the added costs of the coaches were offset by any savings in healthcare utilization within 1 year. Healthcare utilization data were obtained from 5 sources. Multivariate models assessed differences in costs at 1 year controlling for baseline characteristics.

Results: Coaches worked an average of 9 hours with each participant over the length of the study. On average, the health coach intervention cost $483 per participant per year. The average healthcare costs for the coaching group was $3207 compared with $3276 for the control group ($P = .90$). There was no evidence that the coaching intervention saved money at 1 year.

Conclusions: Health coaches have been shown to improve clinical outcomes related to chronic disease management. We found that employing health coaches adds an additional cost of $483 per patient per year. The data do not suggest that health coaches pay for themselves by reducing healthcare utilization in the first year.

Am J Manag Care. 2016;22(4):e141-e146

Primary care clinicians, especially in resource-poor settings, often face competing demands and resource constraints that impede their ability to provide high-value care that improves patient outcomes while minimizing the use of resources. These clinicians are tightly scheduled to manage patients, many of whom have multiple chronic conditions, limited means, and low health literacy. Frequently, a clinician cannot address a patient's needs in a single visit.[1,2] New evidence-based models of care are needed to provide self-management support in primary care that is culturally and linguistically appropriate, as well as financially sustainable in resource-poor settings.[3]

Health coaches represent a unique resource for self-management support in primary care. They help patients gain the knowledge, skills, and confidence to manage their chronic conditions.[4] Coaches are trained in collaborative communication to improve understanding of, and adherence to, mutually agreed upon care plans. They may provide patients with health-related information, navigational support though the healthcare system, connections to community resources, and emotional support. Although health coaches may come from a variety of training backgrounds, medical assistants are emerging as a common and relatively economical workforce that may meet the demand for self-management support. Health coaching has been proposed as an inexpensive and effective means to improve control of chronic conditions, including risk factors for cardiovascular disease, such as diabetes, hypertension, and hyperlipidemia.[5] Coaches may be particularly valuable in resource-poor settings, where minority and low-income communities bear a disproportionate burden of chronic disease and its complications and are less likely to engage in effective self-management of their conditions.[6,7] In these settings, clinics can employ coaches that culturally and linguistically match the patients' characteristics.[8]

Previous studies have found health coaching to be effective in improving outcomes for chronic conditions, including dia-

Take-Away Points

Studies have shown that health coaches yield modest clinical benefits. Many clinics, especially those with limited resources, have questions about the budgetary impact of hiring additional staff. Linked with a coaching intervention, we found that:

- Health coaches cost $483 per participant per year.
- There was no evidence that coaches saved money at 1 year (through a hypothesized reduction in care).
- In 2015, CMS approved a monthly payment of $42.60 for chronic care management per qualified patient (defined as having 2 or more significant chronic conditions). Such payments would enable many clinics to train coaches to provide essential services for patients with multiple chronic illnesses.

betes, hypertension, asthma, and hyperlipidemia.[9-15] However, for health coaching to be adopted on a wider basis, more must be understood about the budgetary impact for clinics interested in this model. For this reason, we analyzed cost data from a randomized controlled trial of health coaches versus usual care. Our goal was to determine the added costs associated with implementing a health coaching program in 2 primary care clinics and then to examine whether the added costs of the program were offset by any changes in short term healthcare utilization (within 1 year).

METHODS

Background

The Health Coaching in Primary Care (HCPC) study was a randomized controlled trial testing the efficacy of health coaching versus usual care to help low-income patients with uncontrolled type 2 diabetes, hypertension, and/or hyperlipidemia to better manage their condition(s) at 12 months. The study was conducted at 2 San Francisco safety net clinics from April 2011 to June 2012. Patients were eligible if they were between the ages of 18 and 75, spoke Spanish or English, could be reached by phone, and had poorly controlled diabetes (glycated hemoglobin [A1C] ≥8%), hypertension (systolic blood pressure [SBP] ≥140 mm Hg), and/or hyperlipidemia (low-density lipoprotein cholesterol [LDL-C] ≥160 mg/dL for patients without diabetes or ≥100 mg/dL for patients with). A total of 441 (66.4%) patients provided informed consent, completed baseline measures, and were randomized to usual care plus health coaching (n = 224) or usual care alone (n = 217). More details on the HCPC study design and methods have previously been published.[3]

The study employed 3 medical assistant health coaches. Each coach attended 40 hours of training over 6 weeks based on a curriculum of: active listening and nonjudgmental communication; self-management skills for diabetes, hypertension, and hyperlipidemia; social and emotional support; lifestyle change; medication understanding and adherence; clinic navigation; and community resources. The study team developed the curriculum, which is available online.[16] Each health coach managed a panel of 40 to 60 patients; no limitations were placed on the time that a health coach could spend with a patient. The coaches attended medical visits with patients, met with them before and after the visit, and called or met with them between visits. Health coaches helped patients review their medications, ensured that they understood their lab results and their goals, assisted in creating action plans for personalized behavior change, and assisted with navigation of clinic and community resources. Patients faced no co-payments or other financial barriers for meetings with their health coach. The coaches were paid a salary, and the study did not employ any financial incentives (eg, bonuses) for coaches to meet performance targets.

After 12 months, patients randomized to health coaching were more likely to have met the primary outcome of control for 1 or more of the conditions for which they were enrolled than patients in usual care (46.4% vs 34.3%; $P = .02$).[17] This result was driven primarily by the benefit of health coaching on control of diabetes (change in A1C of –1.2% vs –0.5%) and, to a lesser extent, by control of hyperlipidemia (change in LDL-C of –28 mg/dL vs –18 mg/dL).

Costs of the Health Coach Program

Our first goal was to assess the cost of implementing a health coach program. We estimated the cost of the health coaches based on labor, training, supplies, and space. We tracked the hours of work spent by the health coaches as related to the intervention, excluding research-specific activities. The total time spent coaching (estimated as 5376 hours, or 60% of the total full-time equivalent [FTE]) was calculated based on time studies conducted at 3 intervals during the study; it excluded time that was spent assisting with other study activities, such as chart review for eligibility screening or assisting with trainings in other locations.

The amount of health coaching time spent per patient was derived from interaction forms that health coaches completed after each encounter. The health coaches were paid $19 per hour, plus benefits (30% of the FTE). The coaching program included 40 hours of training time for each health coach and the course trainer. In addition, there was ongoing mentoring and observation, estimated at 1 hour per month per coach and the trainer. Because wages are higher in San Francisco compared with the national median, cost analyses were also run using median salary data from the Bureau of Labor Statistics, which was $13.28

per hour, plus an additional 30% for benefits. The coaches shared an office of 222 square feet, which was the equivalent of three 8×9 cubicles with additional filing space; this space is consistent with government benchmarks.[18] Office space was valued at a cost of $25 per square foot. Accounting databases from San Francisco General Hospital were queried to estimate the costs associated with telephones ($24/FTE/month), computer hardware, network and support ($90/FTE/month), and supplies ($50/FTE/month).

Healthcare Utilization and Costs

Our second goal was to determine the budgetary impact of the health coaching program. We tested whether the added costs of the coaches were offset by any savings in healthcare utilization within 1 year. Utilization data were obtained from clinics, health systems, and insurers. Of the 2 clinics involved in this trial, one (Site A) was an independent federally qualified health center; we obtained utilization data for primary care services from its practice management and pharmacy system. At the second clinic (Site B), utilization data—including primary care, specialty, inpatient, and emergency department (ED) care—were drawn from the health system.

The inpatient and ED care for Site A that occurred within the health system were also available through this data set; however, pharmacy data were not available for Site B. Visits to external hospitals and EDs were identified through patient report, and diagnosis and visit information was abstracted from discharge reports. For the utilization data, we estimated Medicare payments based on Current Procedural Terminology codes, when available. California Medicaid (MediCal) estimated payments were used for services not covered by Medicare, namely maternal services.

Payer information was also collected for 239 participants who were covered under either MediCal or Healthy San Francisco, a local health insurance system funded by the county. This data set included inpatient, ED, outpatient, and pharmacy claims across all reporting hospitals and clinics. Of these 239 patients, 192 were covered by one of these programs for at least half of the year (at least 182 days). These data included payments or charges. To estimate costs, we used payments when available; otherwise we cost-adjusted the charges using Medicare's hospital-specific cost-to-charge ratio.

In total, the analysis pooled utilization data from 5 data sets. We extracted data for the year prior to the intervention and for the year following randomization. We standardized costs to 2013 using the US general consumer price index. Given the possibility of duplicate records across these data sets, we examined claims for an individual based on dates, and we examined records based on the providing clinician and date. All data cleaning was blind to treatment assignment.

Analysis

We compared participants randomized to usual care or to health coaches. We examined differences based on gender, age, whether they were born in the United States, race/ethnicity, marital status, formal educational attainment, yearly income, English as a first language, and employment status. We used bivariate statistics to compare treatment groups' health services costs at 1 year; we examined the cost across the 5 data sources to ensure consistency of results. We also estimated counts of services from the claims data, but were less confident that each claim represented a unique visit or stay—we treated this as a check on the cost data.

We used multivariate models to control for possible observed differences and to run sensitivity analyses, and ordinary least squares for the primary multivariate analysis, controlling for clinic and the covariates listed above. Sensitivity analyses used semi-log and generalized linear models with a log link and a gamma distribution. We ran 2 subsample analyses: first, we examined whether there were differential effects by clinic; second, we examined the impact of the intervention on patients who had healthcare costs in the top quartile in the year prior to the intervention to determine whether the intervention had a differential effect for high-cost patients.

RESULTS

Participants had an average age of 52.7 years, with a broad range of 22 to 75 years (Table 1). Approximately half of the participants were women. The population exemplified those seeking care at resource-poor settings, with over half reporting a household income of $10,000 or less and only 12% reported an income of more than $20,000 per year. There were no significant differences in characteristics of the sample between the intervention and the control groups.

Health coaches worked, on average, 9 hours with each participant over the length of the study. There was considerable variation in how much time coaches spent with participants: at the upper end, a coach spent 27.4 hours with a participant. Intervention costs were allocated to the patients based on the hours the coaches spent with each patient. On average, the health coach intervention cost $483 per participant per year period (Table 2). Wages are higher in San Francisco than the national median, so based on the national median wage rate, we expect the coaching intervention would average $356 per participant per year.

The majority (70%) of the intervention was attributable to direct labor costs: the time and effort coaches spent working

Table 1. Demographic Characteristics of Participants by Study Arm

	Health Coaching, %	Usual Care, %	Total, %	*P*
Female gender	52.2	58.5	55.3	.184
Age, years: mean (SD)	52.6 (10.7)	52.8 (11.5)	52.7 (11.1)	.790
English as first language	28.6	26.7	27.7	.665
Born in the United States	26.3	24.9	25.6	.726
Race/ethnicity				.662
Asian	3.1	5.1	4.1	
African American	19.6	18.4	19.0	
Latino	69.2	71.0	70.1	
White	2.7	2.3	2.5	
Other	5.4	3.2	4.3	
Married	49.1	57.1	53.1	.091
High school education or more	42.0	43.8	42.9	.700
Employment				.489
Full-time	21.0	16.1	18.6	
Part-time	25.0	26.3	25.6	
Unemployed	10.7	17.1	13.8	
Homemaker	16.1	16.1	16.1	
Retired	9.8	10.1	10.0	
Disabled	2.7	1.8	2.3	
Other	14.7	12.4	13.6	
Yearly income				.507
<$4999	36.6	31.3	34.0	
$5000-$9999	23.2	25.3	24.3	
$10,000-$19,999	29.9	29.0	29.5	
≥$20,000	10.3	14.3	12.2	

with patients. Of the remainder, 6% was related to training coaches and 24% was related to staff benefits, staff office space, and supplies. These costs and percentages were based on national wages. If we consider costs in San Francisco, where the labor costs are higher than the national average, the percentage of total costs related to labor increases from 70% to 74.5% and there is a corresponding small increase in staff benefits, whereas the other relative percentages drop slightly.

Despite the substantial investment in health coaching time, utilization and healthcare costs were relatively similar between the 2 treatment groups. The average 1-year healthcare costs for patients in the coaching group was $3207 compared with $3276 for the control group ($P = .90$) (Table 2)—this total does not include the intervention. As shown in Table 2, there was a higher maximum in the control group, but the median costs were slightly higher in the coaching group (median = $823) than the control group (median = $735). We tested for cost differences across the different administrative data sets and found similar results, confirming that the results were not obscuring differences across clinics or data sets. The results were highly robust to the choice of statistical model. Using semi-log regression or general linear models had no substantive change in the results compared with ordinary least squares. In the subsample analysis, we found no significant differences by clinic. We also found no evidence to suggest that the intervention saved money for the high-cost patients, defined as patients in the top 25% of healthcare costs in the prior year.

DISCUSSION

Health coaches have been shown to improve clinical outcomes related to chronic disease management. Although many of the gains in clinical outcomes are modest, health coaches are relatively inexpensive compared with nurses or physicians. Adding health coaches costs approximately $483 per patient per year ($356 per patient per year using nationalized costs). These estimates are similar to the cost for health coaching by community health workers in previous studies. One evaluation of a community-based support program for Latinos with diabetes (Project Dulce) estimated an intervention cost of $507 per patient per year (2002 dollars).[19,20] Another study of a community health worker program to improve control of diabetes found a mean cost of $1176 per patient over 18 months ($784/patient/year).[21] A recent report of the costs of diabetes self-management programs in 4 community primary care settings found first-year costs ranging from $832 to $2340 per patient.[22] Given a cost of $483 per patient per year, one question is how to pay for these coaches.

Downstream savings. One possible way is through downstream savings, perhaps by engaging the patients in timely services that avert inappropriate care. In the current study, we did not find significant savings in health costs for the coached group over the 1-year study period. Although many might hope that health coaches would save money in the short term, the rationale is often predicated on the expectation that patients will reduce their utilization of inappropriate care. The corollary to this is that patients often increase their use of appropriate care, including medications and scheduled visits to their doctor. Of course, it is challenging, using administrative records, to distinguish between inappropriate and appropriate care.

In Project Dulce, healthcare costs were actually higher in the intervention group by a mean of $842 per year, primarily due to the high costs of prescription medications[23]—this higher cost could be appropriate if patients in the interven-

Table 2. Unadjusted and Adjusted Coach Costs and 1-Year Healthcare Costs

	Health Coaching			Usual Care			Unadjusted Mean Difference	Adjusted Mean Difference[a]
	Mean	SD	Max	Mean	SD	Max		
Intervention cost (SF $)	483	274	1466	0	0	0	482[b]	489[b]
Intervention cost (Nat $)	356	202	1081	0	0	0	355[b]	361[b]
Total 1-year healthcare costs ($)	3207	6541	47,862	3276	12,844	152,322	–69	–121
Net cost (SF $)	3690	6552	48,259	3276	12,844	152,322	414	81
Net cost (Nat $)	3563	6548	48,155	3276	12,844	152,322	287	–47

Max indicates maximum; Nat; national wage rates, SF, San Francisco wage rates.
[a]Adjusted mean difference is from ordinary least squares regression controlling for gender, age, English as a first language, being born in the United States, race, marital status, education, employment status, annual income, and clinic.
[b]Two-sided *P* value <.001.
Numbers were rounded.

tion group were filling prescriptions for needed medications they would otherwise have lacked.[24,25] ED and inpatient utilization are often used as proxies for inappropriate utilization; however, utilization of these services is typically rare, as was the case in this study, leaving little room to save money for most patients. When we limited the analysis to patients in the highest cost quartile, the results were not significantly different; however, the number was too small to make a definitive statement about the impact of health coaching on costs for "high-utilizers." A study focused on high-utilizers would be needed to answer this question.

In the current study, we did not examine costs beyond the 1-year of health coaching, and 1 year is probably too short a time to expect to see differences in complication rates related to glycemic control. In addition, we did not model cost-effectiveness.[26] Previous investigators analyzing data from the UK Prospective Diabetes Study found that a 1% reduction in mean A1C was associated with reductions of 21% for diabetes-related deaths, 14% for myocardial infarctions, and 37% of microvascular complications of diabetes (eg, renal failure) over an approximately 10-year period.[26]

A lifetime cost-effectiveness analysis using data from Project DULCE for the subgroup of patients most similar to those in our study (receiving county medical services and a mean improvement in A1C of 0.8%) found the cost to be $24,584 per quality-adjusted life-year [QALYs]), assuming the intervention was continued and the improvement in A1C persisted.[20] The investigators who reported the results of 4 community-based diabetes self-management programs also ran the CDC/Research Triangle Institute model to estimate lifetime cost savings assuming an on-going reduction of 0.5% in A1C, a 10% reduction in LDL-C, and no change in SBP. The estimated lifetime savings in healthcare costs was $3385 per patient, while the lifetime intervention cost was estimated at $15,031 per patient, resulting in a net cost of $29,563 per QALY.[22] In our study, we found a similar effect (mean reduction of 0.7% in A1C, 7% in LDL-C, and no significant change in SBP).

Reimbursement. Another way to pay for coaching is through reimbursement. To date, few insurers provide reimbursement for health coaching, but recent changes by CMS may open the door for further coverage. For 2015, CMS approved a monthly payment rate of $42.60 for chronic care management per qualified patient (defined as having 2 or more significant chronic conditions).[27] CMS continues to clarify which clinical staff qualifies for reimbursement and the required level of supervision. However, if coaches are capable of being reimbursed, then annualized Medicare reimbursement would offset the cost of the coach—of course, this would only cover services provided by the coaches to adults covered by Medicare, but other insurers might also follow suit.

Limitations

A key limitation in this study is the reliance on administrative records, drawn from multiple sources that were not mutually exclusive. Although efforts were taken to eliminate duplication using provider names and dates, there remains the possibility that utilization was double-counted or there was missing information. In addition, ED and hospital visits at hospitals other than the county-administered hospital were identified through patient self-reporting; thus, it is possible that this method could lead to errors, even though self-report is often accurate for these highly salient, uncommon events. In addition, it seems unlikely that any errors would systematically differ for either the experimental or control arm. Finally, this cost analysis covered a time period of only 1 year, and it may have failed to capture downstream savings from improved glycemic control or cholesterol after 1 year.

CONCLUSIONS

The incremental costs from health coaching in this study were relatively small compared with total health costs, but no cost savings were found during the year of coaching. Previous studies and models suggest benefits of continual control would accrue over time; however, there are few models that guide how to project the future costs of coaching. If coaches stopped working with patients after 1 year, the benefits might erode over time. Additional research is needed to understand the long-term benefits and costs of health coaching programs.

Author Affiliations: Department of Health Research and Policy, Stanford University (THW), Stanford, CA; Health Economist, VA Palo Alto Health Care System (THW), Palo Alto, CA; Department of Family and Community Medicine, University of California, San Francisco School of Medicine (RW-G, EC, TB, DHT), San Francisco, CA; Silver Avenue Health Center (EC), San Francisco, CA.

Source of Funding: This study was funded by the Gordon and Betty Moore Foundation (GBMF2492).

Author Disclosures: Ms Willard-Grace's salary is paid in part by research grants related to health coaching, including a grant from PCORI, which was received for 2014-2017 for COPD-related coaching; she has also attended meetings by ADA, Academy Health, and was a presenter at NAPCRG. Ms Willard-Grace's employer is a Center for Excellence in Primary Care and has a training arm that is paid to conduct trainings and receives licensing fees. The remaining authors report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article.

Authorship Information: Concept and design (TB, EC, DT, TW); acquisition of data (DT, RW-G, EC); analysis and interpretation of data (TW, DT, EC); drafting of the manuscript (TW); critical revision of the manuscript for important intellectual content (DT, RW-G); statistical analysis (TW, DT); provision of patients or study materials (DT, RW-G); obtaining funding (DT, TB, EC); administrative, technical, or logistic support (DT, RW-G, EC); and supervision (TW, DT, EC).

Address correspondence to: Todd H. Wagner, PhD, 795 Willow Rd (152-MPD), Menlo Park, CA 94025. E-mail: twagner@stanford.edu.

REFERENCES

1. Østbye T, Yarnall KS, Krause KM, Pollak KI, Gradison M, Michener JL. Is there time for management of patients with chronic diseases in primary care? *Ann Fam Med.* 2005;3(3):209-214.

2. Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health.* 2003;93(4):635-641.

3. Willard-Grace R, DeVore D, Chen EH, Hessler D, Bodenheimer T, Thom DH. The effectiveness of medical assistant health coaching for low-income patients with uncontrolled diabetes, hypertension, and hyperlipidemia: protocol for a randomized controlled trial and baseline characteristics of the study population. *BMC Fam Pract.* 2013;14:27. doi: 10.1186/1471-2296-14-27.

4. Ghorob A. Health coaching: teaching patients how to fish. *Fam Pract Manag.* 2013;20(3):40-42.

5. Bodenheimer T, Willard-Grace R, Ghorob A. Expanding the roles of medical assistants: who does what in primary care? *JAMA Intern Med.* 2014;174(7):1025-1026. doi: 10.1001/jamainternmed.2014.1319.

6. National diabetes fact sheet, 2011. CDC website. http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf. Published 2011. Accessed November 15, 2012.

7. Thackeray R, Merrill RM, Neiger BL. Disparities in diabetes management practice between racial and ethnic groups in the United States. *Diabetes Educ.* 2004;30(4):665-675.

8. Chapman S, Marks A, Chan M. The increasing role of medical assistants in small primary care physician practice: key issues and policy implications [research brief]. Healthforce Center at UCSF website. http://healthforce.ucsf.edu/sites/healthforce.ucsf.edu/files/publication-pdf/2.%202010-02_The_Increasing_Role_of_Medical_Assistants_in_Small_Primary_Care_Physician_Practice.pdf. Published February 2010. Accessed October 1, 2013.

9. Bennett HD, Coleman EA, Parry C, Bodenheimer T, Chen EH. Health coaching for patients with chronic illness. *Fam Pract Manag.* 2010;17(5):24-29.

10. Chen EH, Thom DH, Hessler DM, et al. Using the Teamlet Model to improve chronic care in an academic primary care practice. *J Gen Intern Med.* 2010;25(suppl 4):S610-S614. doi: 10.1007/s11606-010-1390-1.

11. Fisher EB, Strunk RC, Highstein GR, et al. A randomized controlled evaluation of the effect of community health workers on hospitalization for asthma: the asthma coach. *Arch Pediatr Adolesc Med.* 2009;163(3):225-232. doi: 10.1001/archpediatrics.2008.577.

12. Ivey SL, Tseng W, Kurtovich E, et al. Evaluating a culturally competent health coach intervention for Chinese American Patients with diabetes. *Diabetes Spectr.* 2012;25(2). doi: 10.2337/diaspect.25.2.93.

13. Ruggiero L, Moadsiri A, Butler P, et al. Supporting diabetes self-care in underserved populations: a randomized pilot study using medical assistant coaches. *Diabetes Educ.* 2010;36(1):127-131. doi: 10.1177/0145721709355487.

14. Thom DH, Ghorob A, Hessler D, et al. Impact of peer health coaching on glycemic control in low-income patients with diabetes: a randomized controlled trial. *Ann Fam Med.* 2013;11(2):137-144. doi: 10.1370/afm.1443.

15. Turner BJ, Hollenbeak CS, Liang Y, Pandit K, Joseph S, Weiner MG. A randomized trial of peer coach and office staff support to reduce coronary heart disease risk in African-Americans with uncontrolled hypertension. *J Gen Intern Med.* 2012;27(10):1258-1264.

16. Health coaching. University of California, San Francisco, Center for Excellence in Primary Care website. http://cepc.ucsf.edu/health-coaching. Accessed March 2016.

17. Willard-Grace R, Chen EH, Hessler D, et al. Health coaching to improve control of diabetes, hypertension, and hyperlipidemia in low-income patients: a randomized controlled trial. *Ann Fam Med.* 2015;13(2):130-138. doi: 10.1370/afm.1768.

18. Office of Governmentwide Policy. Workspace utilization and allocation benchmark. Government Services Agency website. http://www.gsa.gov/graphics/ogp/Workspace_Utilization_Banchmark_July_2012.pdf. Published 2011. Accessed March 2016.

19. Gilmer TP, Philis-Tsimikas A, Walker C. Outcomes of Project Dulce: a culturally specific diabetes management program. *Ann Pharmacother.* 2005;39(5):817-822.

20. Gilmer TP, Roze S, Valentine WJ, et al. Cost-effectiveness of diabetes case management for low-income populations. *Health Serv Res.* 2007;42(5):1943-1959.

21. Brown HS 3rd, Wilson KJ, Pagán JA, et al. Cost-effectiveness analysis of a community health worker intervention for low-income Hispanic adults with diabetes. *Prev Chronic Dis.* 2012;9:E140. doi: 10.5888/pcd9.120074.

22. Brownson CA, Hoerger TJ, Fisher EB, Kilpatrick KE. Cost-effectiveness of diabetes self-management programs in community primary care settings. *Diabetes Educ.* 2009;35(5):761-769. doi: 10.1177/0145721709340931.

23. Gilmer TP, O'Connor PJ, Rush WA, et al. Predictors of health care costs in adults with diabetes. *Diabetes Care.* 2005;28(1):59-64.

24. Piette JD, Heisler M, Wagner TH. Problems paying out-of-pocket medication costs among older adults with diabetes. *Diabetes Care.* 2004;27(2):384-91.

25. Piette JD, Heisler M, Wagner TH. Cost-related medication underuse among chronically ill adults: the treatments people forgo, how often, and who is at risk. *Am J Public Health.* 2004;94(10):1782-1787.

26. Hoerger TJ. Using costs in cost-effectiveness models for chronic diseases: lessons from diabetes. *Med Care.* 2009;47(7, suppl 1):S21-S27. doi: 10.1097/MLR.0b013e3181a2bf32.

27. Policy and payment changes to the Medicare Physician Fee Schedule for 2015. CMS website. http://www.cms.gov/newsroom/mediareleasedatabase/fact-sheets/2014-Fact-sheets-items/2014-10-31-7.html. Published October 31, 2014. Accessed January 9, 2015. ■

www.ajmc.com Full text and PDF