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Impact on Seniors of the Patient-Centered Medical Home: Evidence From a Pilot Study

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Purpose: To assess the impact on health care cost and quality among seniors of a patient-centered medical home (PCMH) pilot at Group Health Cooper a-tive, an integrated health care system in Washington State. ***Design and Methods:*** A prospective before-and-after evaluation of the experience of seniors receiving primary care services at 1 pilot clinic compared with seniors enrolled at the remain-ing 19 primary care clinics owned and operated by Group Health. Analyses of secondary data on qual-ity and cost were conducted for 1,947 seniors in the PCMH clinic and 39,396 seniors in the 19 control clinics. Patient experience with care was based on survey data collected from 487 seniors in the PCMH clinic and of 668 in 2 specific control clinics that were selected for their similarities in organiza-tion and patient composition to the pilot clinic. ***Results:*** After adjusting for baseline, seniors in the PCMH clinic reported higher ratings than con-trols on 3 of 7 patient experience scales. Seniors in the PCMH clinic had significantly greater quality outcomes over time, but this difference was not significant relative to control. PCMH patients used more e-mail, phone, and specialist visits but fewer emergency services and inpatient admissions for ambulatory care sensitive conditions. At 1 and 2 years, the PCMH and control clinics did not differ significantly in overall costs. ***Implications:*** A PCMH redesign can be associated with improve-ments in patient experience and quality without increasing overall cost.

Key Words: PCMH, Medicare, Geriatric health care

The patient-centered medical home (PCMH) was first proposed more than 20 years ago as a way of providing better-coordinated , family-oriented care for children with special needs (American Academy of Pediatrics, 1999 ; Brewer , McPherson , Magrab , & Hutchins, 1989). Now based on all-ages primary care settings, the PCMH emphasizes long-term relationships between patients and physicians. The approach places a high prior-ity on physician accessibility, coordinating care using an evidence-based approach, maximizing the use of advanced information technology (IT), incorporating the concepts of the Chronic Care Model and aligning reimbursement with improved patient access and outcomes (Berenson et al., 2008). In the two decades since the concept was first developed, public and private policy leaders have refined and embraced the PCMH as a way to improve the quality of primary care, enhance the patient and family experience for individuals of all ages and clinical needs, and reduce the rate of growth of health care costs.

The potential of the PCMH to achieve these benefi ts led the Medicare Payment Advisory Commission (MedPAC) to call for a broad demonstration program to study the value of the PCMH for America ' s 65 million seniors. MedPAC is an inde-pendent agency (Balanced Budget Act of 1997 [P.L. 105-33]) created to advise Congress on issues affecting the Medicare program, and its recommendations are critical as Congress and the Centers for Medicare and Medicaid Services (CMS) develop policy for the nation's largest insurance program. In its report recommending the PCMH demonstration, the Commission noted that whereas traditional fee-for-service medicine emphasizes treatment for acute conditions conducted in face-to-face care encounters, the PCMH encourages providers to coordinate their patients' care between visits and among the various health care providers an individual is likely to see over time. The PCMH approach to organizing primary care is of particular value to seniors and others with high prevalence of chronic illness because it fully embraces the Chronic Care Model (Wagner, 1998), perhaps the most well-known and widely used framework for the effective management of chronic illness.

Following MedPAC's recommendation, Congress authorized CMS to conduct a large PCMH demonstration that would test the value of this approach within primary care through the experiences of 400,000 seniors. To qualify as demonstration sites, physician practices were required to provide or coordinate appropriate preventive, maintenance, and acute health services, furnish primary care, conduct care management, use health IT for active clinical decision support, have a formal quality improvement (QI) program, maintain 24-hr patient communication and rapid access, and keep up-to-date records of benefi ciaries' advance directives (Centers for Medicare and Medicaid Services, 2010). CMS identified three medical home tiers that reflect more comprehensive delivery of services within the PCMH framework and serve as the basis for greater capitated payments. To qualify for the highest tier, a practice must offer all 18 foundational aspects of the medical home and at least 3 other criteria, drawn from a set of 6 other factors (Maxfi eld et al., 2008).

These criteria lay out the goals for a medical home to provide coordinated, proactive care that includes the patient and his/her family in the course of developing and carrying out care management, all predicated on a strong primary care delivery model (Maxfield et al., 2008).

At least one prior study has reported on the impact of components of the medical home on seniors. Before the national CMS demonstration program, the Geisinger Health System implemented a medical home model that featured an embedded case manager who worked with complex patients within primary care practices. The reported analysis of this case manager model was conducted among 8,634 seniors, and 6,676 propensity score matched controls at 11 primary care clinics (Gilfillan et al., 2010). This approach resulted in 56 fewer admissions per 1,000 members and 21 fewer readmissions per 1,000 members, both of which were statistically signifi cant. A $9 reduction in per member per month costs attributable to the case manager program was not statistically significant. No evidence regarding patient experience or quality outcomes was reported.

The medical home pilot at Group Health Cooperative, a large integrated health care system in Washington State, also preceded the national CMS demonstration program. Group Health designed the PCMH pilot using universal principles intended to be applied in any health care setting and used previous investments in its delivery system and health IT to implement that model. However, Group Health's medical home includes features that CMS considers standard in any practice setting attempting to qualify for the greatest incentive payment. For instance, CMS requires that plans have an electronic medical record and use automated data to track patients and provide performance feedback to physicians. Thus, Group Health's PCMH pilot incorporated all the features MedPAC had described as a T ier 3 medical home.

The results of Group Health's PCMH pilot may inform CMS as it considers ways to promote improvements in care for America's seniors. The evaluation we report provides more intensive primary data on patient experience, along with secondary data on health care use and quality of care, than may be generally available for examinations of medical home experiments. Our goal is to help inform the policy debate on whether the medical home is an option for the Medicare program.

We previously reported 1-year (Reid et al., 2009) and 2-year (Reid et al., 2010) results of Group Health's PCMH prototype demonstration. This pilot included many seniors, and we now report findings from this pilot specifically for men and women aged 65 and older. Our goal is to provide evidence from Group Health's PCMH pilot to inform the broader national discussion about the impact of the medical home on seniors. The experience of seniors at Group Health provides some insight into the broader experiment on which CMS will embark.

Design and Methods

Group Health Cooperative is a large integrated health care system headquartered in Seattle, WA, that provides health care and insurance for approximately 600,000 people in the Pacific Northwest, 11% of whom are aged 65 or older. During the study period, Group Health's delivery system included 26 owned and operated primary care clinics throughout Washington State, including 20 in the Puget Sound region of Western Washington, with onsite pharmacies, laboratories, and radiology suites. A system of four specialty clinics and six urgent care/emergency departments support these primary care clinics. Group Health contracts with Group Health physicians medical group to provide exclusive care to enrollees within the closed group practice. The analyses we report include the experience of seniors enrolled in the pilot clinic and the full census of all the other 19 Western Washington clinics.

Since its founding in 1946, Group Health has promoted physician–patient relationships immersed in multidisciplinary teams, a key component of the PCMH. However, beginning in 2007, Group Health made a commitment to a whole-practice primary care redesign aligned with PCMH principles. Health plan leadership felt that reorienting primary health care around the PCMH would create a delivery system that was more responsive to patient needs, better facilitate clinical QI efforts, improve provider and staff satisfaction, and support efforts to reduce the rate of growth of cost. As part of this process, Group Health undertook a pilot within one of its owned and operated primary care clinics in the Seattle metropolitan area, with the goal of applying lessons from this pilot to other clinics. The clinic chosen for the pilot provides care to 9,083 adults of whom 2,161 (23.8%) were aged 65 and older. Details on the decision-making process leading to this system redesign are provided elsewhere (Tufano, Ralston, Tarczy-Hornoch, & Reid, 2010).

Before the PCMH pilot, Group Health primary care physicians (82% family physicians, 3.5% general internists, and 15% pediatricians) were responsible for an average adjusted patient panel of 2,300 people. To allow the clinic to incorporate the PCMH design components into their daily work, Group Health increased clinic staff to allow physicians to reduce mean panel size to 1,800 patients, expand visit times from 20 to 30 min, and allocate daily "desktop medicine" time for staff to perform outreach, coordination, and other activities of the PCMH. This investment in increased staff required 15% more full-time equivalent (FTE) physicians, 44% more FTE physician assistants, 17% more registered nurses, 18% more medical assistants (or licensed practical nurses), and 72% more clinical pharmacists. To accommodate smaller panels, one in four patients enrolled in the pilot clinic were reassigned to other physicians practicing in the clinic. Details on the process and PCMH design principles that Group Health used have been previously reported (Coleman et al., 2010; Reid et al., 2009).

To evaluate the PCMH pilot's impact on patient experience, health outcomes, and health care use and cost among seniors, we drew on an analysis conducted among all adults receiving primary health care at the pilot clinic. We used a prospective, two-group, before-and-after evaluation conducted during the pilot's first 2 years of implementation (January 1, 2007, through December 31, 2009), with outcomes assessed at baseline (calendar year 2006) and 12 and 24 months for patients at the PCMH clinic compared with patients at other clinics.

To assess patient experience with the PCMH, we selected two control clinics based on similarities in size and leadership stability to assess patient satisfaction with the process of care and outcomes related to their personal health care. These two control clinics provide care to 19,543 adults of whom 3,086 (16%) were aged 65 and older. All adults aged 18 and older as of December 31, 2006, with at least 90 days Group Health enrollment during 2006 were included in the analyses that used automated data and were eligible for inclusion in the survey. A random sample of 1,919 adults at the pilot and 3,772 at the two matched clinics received a mailed survey with 3,353 follow-ups at baseline, 2,686 at 12 months, and 2,342 at 24 months using 7 scales from the Ambulatory Care Experiences Survey (ACES)—Short Form (Safran et al., 1998, 2006) and the Patient Assessment of Chronic Illness Care (PACIC; Glasgow et al., 2005). Outcomes were adjusted for individual patient age, education level, and self-reported health status.

Evaluation of PCMH outcomes on clinical quality and health care use and cost that rely on automated health plan data were based on comparisons with all seniors enrolled in all of the other 19 owned and operated Group Health primary care clinics in Western Washington. We focused

on the experiences of seniors enrolled in Western Washington clinics because the organization and delivery of care was similar among these clinics and unlike the six others, which are located in Eastern Washington.

Using previously established methods (Glasgow et al., 2005), we assessed clinical quality using composite measures drawing on 22 indicators from the Health Care Effectiveness Data and Information Set (HEDIS), (National Committee for Quality Assurance, 2008) aggregated into four composites to capture screening (4 measures), chronic illness care (14 measures), and medication monitoring (4 measures). Clinical quality was assessed for patients continuously enrolled for at least 9 months in 2006 and 3 months in 2007 and qualified for at least 1 indicator in both years at the PCMH and the 19 other clinics. Outcomes are reported using four metrics: a "patient average," the mean of the percentage of qualifying indicators that each patient achieved; "100% performance," the percentage of patients achieving success on all qualifying indicators; "75% performance," the percentage of patients achieving success on at least 75% of qualifying indicators; and "50% performance," the percentage of patients achieving success on at least 50% of qualifying indicators.

Health care cost and use were assessed using data routinely collected and reported by Group Health that captures and allocates utilization and costs for all services at Group Health facilities and from external claims. The cost allocation system allows both the determination of costs of specific encounters and the aggregation of costs for individuals over time. Costs excluded from the allocation include those not directly related to delivering health services, the largest portion of which is the cost of administering the health plan's insurance function. The cost model allocates overhead and infrastructure costs on a prorated basis to direct patient services so functional areas such as IT that supports the patient Web site and secure messaging are counted among the resources required to deliver patient care. Group Health collects nominal cost data that we annualized for individuals not enrolled in Group Health for the entire year using the formula: cost × (12/months enrolled). All reported costs are in 2008 inflation-adjusted U.S. dollars using the local medical care price index from the U.S. Bureau of Labor Statistics. The costs of implementing the PCMH are fully allocated to the pilot clinic and are included in our analyses. We examined changes over time in total health care cost as well as cost and use for primary and specialty care, emergency department and urgent care, all acute care, and ambulatory care sensitive hospitalizations. Ambulatory Care Sensitive conditions are those for which timely and effective ambulatory care can decrease hospitalizations by preventing the onset of an illness or condition, controlling an acute episode of an illness, or managing a chronic disease or condition (Bindman et al., 1995).

To test the hypothesis that opportunities to reduce total health care spending through the PCMH would rely on the ability of practices to prevent hospitalizations and readmissions, we constructed monthly series of these events for each patient. We defined readmissions as all medical–surgical patients admitted to acute care within 30 days from time of discharge for primary admission. Total health care spending (plan payment plus copayment) was computed for each member for each month by summing the allowed amount on medical claims. Pharmacy claims were not included in total spending because of variability in prescription drug coverage among members and over time because of the introduction of Medicare Part D in 2006. To protect the confidentiality of Group Health physicians' payment information, we indexed spending so that the mean for patients in the nonintervention practices in January 2005 was set to $100.

We report only utilization outcomes for secure messaging, telephone encounters with health care team members, and telephone calls to the 24-hr centralized consulting nurse service because no accepted standard exists for assigning costs associated with these virtual health care encounters. Due to a change to internal Group Health cost-accounting methods that occurred during the follow-up period, we report costs at 12 and 21 months rather than 12 and 24 months to avoid potential inconsistencies in the data over time, but we have no reason to believe cost trends for the 3 months not included differ from the preceding 12 and 9 months. Health care cost and use were adjusted for baseline differences using a generalized linear model.

Results

As part of a broader survey administered to a random sample of all adults at the pilot and control clinics, 678 seniors at the pilot clinic and 944 seniors at the control clinics received a mailed questionnaire with telephone follow-ups. The random

sample design resulted in the survey being sent to 30% of all seniors in the panel of primary care physicians at the PCMH clinic and 29% of seniors at the control clinics. Among seniors, response rates were 72% (n = 487) and 71% (n = 668) at the pilot and control clinics, both of which exceeded the overall response rate for the survey among all adults.

Table 1 shows survey results reporting patient experience at baseline, 12 and 24 months for seniors in the pilot clinic relative to those in the two control clinics. Patients receiving care at the pilot clinic had higher satisfaction measurements at baseline, 12 and 24 months relative to patients at the control clinics. As Table 1 reports, pilot and control clinics differed significantly in improvements in shared decision making at 12 months and continuity of care and access to care at both 12 and 24 months.

Table 2 provides a summary of the clinical quality measures that were calculated for seniors at the PCMH and the remaining 19 owned and operated control Group Health clinics in Western Washington. Based on the four metrics we report, clinical quality was higher for patients in the PCMH than at the other 19 clinics for each year we examined. Furthermore, quality measures increased throughout Group Health during this time, with each metric showing improvement on a year-to-year basis at the PCMH and the 19 other clinics. The improvement in quality within the PCMH over time was statistically significant, but quality did not differ significantly between the PCMH and the other clinics in the Group Health integrated group practice.

Tables 3 and 4 report results for health care use and cost, respectively. Utilization is reported in rates per 1,000 patients per month and costs per member per month, with all values adjusted for patient and clinic characteristics. Total costs at 12 or 24 months did not change significantly, but other measures of health care use did change significantly: Primary care use declined significantly at the PCMH clinic at 12 and 21 months with increasing costs not rising to a significant level, whereas specialty care use and cost were significantly higher at the PCMH at both 12 and 21 months. Telephone encounters and secure messaging were also significantly higher at the PCMH at both 12 and 21 months, and consulting nurse service calls were lower at both points in time. Emergency room and inpatient admits for ambulatory care sensitive conditions were significantly lower at 12 and 24 months. Overall inpatient use and cost did not differ significantly between patients at the PCMH and control clinics.

Discussion

We present the first empirical results of the impact of the PCMH model that includes information about patient satisfaction, clinical quality, and health care cost and use among seniors. The PCMH

Table 1. Comparison of Patient Experience of Patient-Centered Medical Home (PCMH) Prototype and Two Control Clinics Among Medicare Patients at Baseline, 12 Months, and 24 Months

			ACES-SF subscales[a]					PACIC subscales[a]	
		Survey respondents (n)	QI	SDM	CC	AC	HO	PA	GS
PCMH prototype clinic	Baseline	487	87.1	86.5	84.0	88.1	93.1	75.8	70.2
	12 Month	413	88.6	87.8	86.1	89.4	92.2	80.4	73.2
	24 Month	387	88.1	84.2	87.4	87.7	93.8	79.7	75.0
Two control clinics	Baseline	668	84.1	84.5	82.4	84.1	92.0	75.5	68.8
	12 Month	553	85.7	82.9	82.8	84.1	92.0	76.7	70.7
	24 Month	500	85.1	81.9	84.0	83.1	92.1	76.2	69.8
Adjusted differences	12 Month vs. baseline[b]		1.31	4.28**	2.88*	3.78***	0.51	2.63	0.74
	24 Month vs. baseline[b]		1.43	1.58	3.16*	3.00*	1.03	2.38	3.48

Notes: ACES-SF = Ambulatory Care Experiences Survey—Short Form; PACIC = Patient Assessment of Chronic Illness Care Survey; QI = quality of doctor–patient interactions; SDM = shared decision making; CC = coordination of care; AC = access to care; HO = helpfulness of office staff; PA = patient activation/involvement; and GS = goal setting/tailoring.

[a]The ACES-SF and PACIC questions (scored on 6- and 5-point Likert scales, respectively) were totaled within the subscales and then transformed to 100-point summary scores.

[b]Adjusted mean difference and p value from generalized linear estimating equation regressions comparing average 12- and 24-month scores adjusting for age, educational attainment, self-reported health status at baseline, and baseline patient experience between the PCMH and the control clinics.

*p < .05. **p < .01.***p < .001.

Table 2. Comparison of Quality Composite Measures at Baseline, 12 Months, and 24 Months at Patient-Centered Medical Home (PCMH) and 19 Other Group Health Clinics

Site[b]	Period	Quality of care composite measure[a] Patient average (%)	100% Performance (%)	75% Performance (%)	50% Performance (%)
PCMH	2006 Rating	69.9	52.8	60.4	78.9
prototype	2007 Rating	71.9	53.9	61.8	81.1
clinic	2008 Rating	78.0	62.5	70.9	85.2
(n = 1,415)	12-Month difference (2006–2007)[c]	2.0*	1.1	1.5	2.2
	24-Month difference (2006–2008)[c]	8.1***	9.8***	10.5***	6.3***
Other	2006 Rating	65.7	43.7	53.5	76.4
clinics	2007 Rating	68.1	46.7	56.7	78.3
(n = 30,067)	2008 Rating	72.2	52.6	62.3	81.3
	12-Month difference (2006–2007)[c]	2.4***	3.1***	3.3***	1.9***
	24-Month difference (2006–2007)[c]	6.4***	8.9***	8.8***	4.9***
Difference of changes at 12 months between clinics[d]		–0.34	–1.95	–1.77	0.29
Difference of changes at 24 months between clinics[d]		1.66	0.86	1.71	1.40

[a]*Notes:* Composites aggregate 22 quality indicators from the Health Care Effectiveness Data and Information Set. The "patient average" is the average of the percentage of qualifying indicators that each patient achieved, "100% performance" is the percentage of patients achieving success on all qualifying indicators, "75% performance" is the percentage of patients achieving success on at least 75% of qualifying indicators, and "50% performance" is percentage of patients achieving success on at least 50% of qualifying indicators.

[b]Continuously enrolled patients (2006–2008) who qualified for at least one of the 22 indicators in each year.

[c]p Value from paired t test for the average change in percentages between baseline and implementation years across patients qualifying for the measures in the clinic.

[d]p Value from two-sample t test assuming unequal variances for the average difference in changes from baseline to implementation years between the prototype and other clinics.

*$p < .05$. **$p < .01$. ***$p < .001$.

pilot implemented at Group Health met the criteria for a Tier 3 medical home per CMS regulations and the National Committee for Quality Assurance Level 3 recognition, and our findings have important implications for the broader impact of the medical home care model among America's seniors.

As the overall study (Reid et al., 2009, 2010) focused on the entire cohort of patients at the PCMH, the patient survey was not explicitly powered to detect changes in outcomes among seniors. However, the large number of patients surveyed, combined with the high response rates among seniors, allowed us to conduct analyses among this subset of individuals. Likewise, the high proportion of seniors at the PCMH grants us adequate sample size to conduct studies of cost and utilization, though without the power to detect small differences between the PCMH clinic and other clinics.

We found that seniors in the PCMH clinic reported improved experiences with shared decision making and continuity of care relative to seniors receiving primary care in two control clinics. Seniors in the PCMH made fewer and less costly visits to the emergency department and had fewer hospitalizations for ambulatory care-sensitive diagnoses, although overall use and cost for hospital care did not differ significantly. Despite an investment in increased clinical staff needed to implement the medical home, overall costs of care were no greater among seniors in the medical home clinic than at the other primary care clinics owned and operated by Group Health, indicating that a PCMH can be implemented without increasing short-run health care costs.

Our study had other findings that warrant attention. Seniors in the PCMH made fewer primary care visits than did those in control clinics. The smaller number of visits could be a function of PCMH focus on fewer but longer and more intensive primary care visits. This could also explain the fact that despite fewer visits, primary care spending was slightly (although not statistically significantly) greater. Some secure messaging or telephone visits may have substituted for some initial or follow-up visits, contributing to fewer face-to-face primary care visits. The costs allocated to primary care include the increased investment in physician and nonphysician personnel required to implement the PCMH model, so the lack of statistically significant higher costs in the PCMH clinic suggests no net increase

Table 3. Comparison of Adjusted Utilization (per 1,000 patients per month) Over 12 and 21 Months at Medical Home Prototype and 19 Other Group Health Clinics

Utilization visits per 1,000 patients per month (95% confidence interval)	Interval	PCMH prototype (n = 1,947)	Other clinics (n = 39,396)	Relative difference	p Value
Primary care	12 Month	424 (409, 441)	442 (438, 445)	96% (93%, 100%)	.052
	21 Month	406 (391, 421)	434 (430, 438)	93% (90%, 97%)	<.001
Specialty care	12 Month	438 (419, 458)	406 (402, 411)	108% (103%, 113%)	.001
	21 Month	445 (427, 463)	425 (421, 430)	105% (100%, 109%)	.036
Emergency department and urgent care	12 Month	39 (36, 43)	50 (49, 51)	78% (72%, 84%)	<.001
	21 Month	44 (41, 47)	56 (55, 57)	79% (73%, 85%)	<.001
Inpatient admissions (ambulatory care-sensitive conditions only)	12 Month	1.1 (1.0, 1.3)	1.5 (1.5, 1.6)	75% (65%, 87%)	<.001
	21 Month	1.5 (1.3, 1.7)	1.8 (1.7, 1.8)	82% (72%, 93%)	.002
Inpatient admissions (all causes)	12 Month	13 (11, 14)	13 (13, 13)	98% (89%, 107%)	.625
	21 Month	14 (13, 15)	15 (14, 15)	95% (88%, 104%)	.265
Consulting nurse calls	12 Month	122 (114, 130)	133 (131, 135)	91% (85%, 98%)	.007
	24 Month	119 (112, 126)	139 (138, 141)	85% (80%, 90%)	<.001
Secure messages	12 Month	241 (227, 255)	116 (113, 118)	208% (196%, 221%)	<.001
	24 Month	269 (255, 284)	134 (132, 137)	200% (189%, 212%)	<.001
Telephone encounters	12 Month	540 (518, 564)	462 (458, 468)	117% (112%, 122%)	<.001
	24 Month	541 (520, 563)	492 (487, 497)	110% (106%, 115%)	<.001

Note: PCMH = patient-centered medical home. Adjusted rates and rate ratios estimated from generalized linear models run using a log link, Poisson error, correcting for over dispersion, and adjusting for age, gender, and diagnostic cost group (DxCG score) at baseline (2006).

in costs because of the changes made to establish the medical home.

More frequent specialty care visits and higher costs among seniors in the PCMH may be due to an increased detection of previously undiagnosed conditions detected through more intensive primary care visits. The decreased number and cost of emergency department visits and hospitalizations for ambulatory care-sensitive conditions without any change in overall inpatient use suggest improved outpatient management of conditions that might otherwise have resulted in emergency room visits or inpatient stays.

Increased virtual visits, both via secure messaging and telephone encounters, were a predictable outcome of the PCMH, which emphasized building infrastructure to support more direct contact between patients and members of their personal

Table 4. Comparison of Adjusted Costs (dollars per patient per month) Over 12 and 21 Months at Medical Home Prototype and 19 Other Group Health Clinics

Patient care costs[a]	Interval	PCMH prototype (n = 1,947)	Other clinics (n = 39,396)	Cost difference	p Value
Primary care	12 Month	$82 ($80, $85)	$80 ($79, $81)	$2.18 ($–0.51, $4.86)	.112
	21 Month	$82 ($79, $84)	$80 ($79, $81)	$1.46 ($–1.20, $4.12)	.283
Specialty care	12 Month	$181 ($169, $193)	$158 ($155, $161)	$22.74 ($10.87, $34.61)	<.001
	21 Month	$183 ($173, $193)	$164 ($162, $166)	$18.82 ($8.90, $28.75)	<.001
Emergency department and urgent care	12 Month	$27 ($24, $29)	$27 ($27, $28)	$–0.76 ($–3.18, $1.66)	.537
	21 Month	$31 ($28, $34)	$32 ($31, $33)	$–1.13 ($–4.07, $1.82)	.454
Inpatient admissions (all cause)	12 Month	$227 ($198, $255)	$253 ($239, $267)	$–26.18 ($–52.86, $0.50)	.054
	21 Month	$261 ($232, $291)	$278 ($267, $289)	$–17.08 ($–46.84, $12.70)	.261
Total costs	12 Month	$806 ($765, $846)	$803 ($787, $819)	$2.79 ($–37.33, $42.91)	.892
	21 Month	$849 ($807, $890)	$854 ($841, $868)	$–5.92 ($–47.61, $35.78)	.781

Notes: PCMH = patient-centered medical home. Adjusted costs estimated from generalized linear models run using an identity link, gamma error, and adjusting for age, gender, and baseline costs (2006).

[a]Costs represent per patient per month nominal costs for patient care incurred at Group Health facilities and from external claims. Costs exclude those not directly related to providing health services and patient out-of-pocket costs. Costs annualized for those patients not enrolled for entire year. Costs reported as 2005 inflation-adjusted U.S. dollars using the local medical price index from the U.S. Bureau of Labor Statistics.

medical care team. Reduced phone calls to the centralized consulting nurse service may have been a direct outcome of the increased focus on the relationship between the patient and the care team. Patients who felt they had easy access to their care team had less need to contact the centralized service. Clinical quality, measured through HEDIS scores, increased among seniors at the PCMH clinic, but this increase was not statistically significant. Contributing to the lack of a statistically significant finding for this improvement is the overall high-quality level already being achieved within the PCMH pilot clinic relative to other clinics. In addition, overall quality improved throughout Group Health during the time we studied.

Our findings have positive implications for the potential of the medical home model as a means of providing primary care for America's seniors, but our study is subject to several key limitations. Although the clinic that Group Health chose for the pilot included a larger percentage of seniors than its average clinic, the pilot did not focus exclusively on seniors. When the medical home model is applied to a clinic that has a specific focus on geriatric medicine, unique challenges are likely. Some aspects of the PCMH may not work as well for seniors. Central to the PCMH is increased patient access to their health care team, which includes a reliance on virtual visits through phone calls or secure messages. As we reported in Table 3, seniors in the PCMH pilot did increase their use of secure messaging relative to controls, but this experience may not be universal among seniors in other care settings. Seniors, particularly those with chronic conditions, may be less comfortable with secure messaging, and other applications of the PCMH should consider how best to ensure the increased access to care that is at the core of the medical home.

Our study used a quasi-experimental design, and we recognize the limitations inherent in such research. Controlled experiments generate evidence that is less subject to concerns about selection of patients and care settings as well as the impact of unmeasured or even unknown confounders. We submit that it is increasingly difficult if not impossible to study the impact of broad changes in care delivery models or health care finance using controlled and blinded randomization techniques because of the pressure that health plans and providers face to respond to market force and other external forces. Certain methods for natural and quasi-experimental research designs, including the approach used in our study, are accepted, but we must continue to improve on these standards and also allow for the results of these studies to contribute to the evidence base with respect to best practices in health care delivery and finance.

Our study also has several strengths. We found similar results for the impact of the PCMH among seniors as have been reported for analyses among all adults on the ACES with greater relative improvements on the Shared Decision Making and Access to Care scales. Seniors reported greater relative improvements on the Patient Activation scale of the PACIC instrument and slightly lower but still improved outcomes on the PACIC's Goal Setting scale. The direction of change in health care use was the same among seniors for all components of health care use, as previously reported for all adults. We found a lower relative decrease in inpatient admissions for seniors than has been reported elsewhere in the literature, but this result may be due to lower overall rates of hospitalizations in the Seattle marketplace, which reduces opportunities to reduce absolute and relative inpatient stays compared with other markets, particularly those with lower managed care penetration.

We reported previously (Coleman et al., 2010) that individuals reassigned to other physician panels to achieve the overall reduction in panel size did not disenroll from Group Health at a greater rate. Nor did use of emergency department or urgent care visits differ significantly between patients who were reassigned and those who were not in the 2 years following the implementation of the medical home.

Our results are consistent with previously published findings on the impact of the PCMH among all adults, including seniors. Although the growing body of literature concerning the value of the PCMH increasingly points to its potential to improve patient care and satisfaction without growing overall health care costs, additional research is needed into the medical home's potential beyond the relatively controlled settings of existing studies. In particular, more information is needed about the impact of the medical home outside of integrated practices in settings that may not have many of the resources in place to support the PCMH model.

In addition to the PCMH, disease management programs for seniors with chronic medical needs are also being studied for their potential to improve outcomes and address rising health care costs for seniors. Several studies have examined various approaches to delivering disease management services and have found that these programs have

not been successful in reducing or at least maintaining constant cost or improving health outcomes and patient satisfaction with their care (Bott, Kapp, Johnson, & Magno, 2009; Cromwell, McCall, & Burton, 2008; McCall & Cromwell, 2011; Peikes, Chen, Schore, & Brown, 2009). One reason why disease management programs have not yielded results as promising as those of the PCMH may be that disease management programs are seldom integrated directly into primary care (Coleman, Mattke, Perrault, & Wagner, 2009).

The medical home at its core creates a robust primary care delivery system that coordinates care for general practice populations throughout the delivery system and engages patients proactively in their own health care across their range of health concerns. This may be the critical element for improving health care for all seniors and in particular those with chronic illness, but further research is needed to assess how best to create a strong complementary relationship between primary and specialty care services for individuals with more complex medical needs.

CMS and other policy leaders may consider coordination and continuity of care when deciding how best to organize care for seniors with chronic medical conditions. Continuity of care is critical to ensuring that everyone with chronic medical needs, in particular seniors, receive effective, timely, and safe health care. Recent research has extended the importance of continuity of care for seniors as well as providing tools to assess how best to ensure that continuity is provided to those that would most benefit (Koren, 2011). Research also continues to document the role of programs that reduce hospitalizations among seniors, and such programs should be considered complementary to the primary care–based PCMH to achieve comprehensive care management for seniors (Meret-Hanke, 2011).

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