Redesigning Primary Care to Improve Diabetes Outcomes (the UNITED Study)

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Kevin A. Peterson,[1] Caroline Carlin,[1] Leif I. Solberg,[2] Rachel Jacobsen,[1] Toni Kriel,[1] and Milton Eder[1]

EPIDEMIOLOGY/HEALTH SERVICES RESEA

OBJECTIVE

The effective redesign of primary care delivery systems to improve diabetes care requires an understanding of which particular components of delivery consistently lead to better clinical outcomes. We identified associations between common systems of care management (SysCMs) and the frequency of meeting standardized performance targets for Optimal Diabetes Care (NQF#0729) in primary care practices.

RESEARCH DESIGN AND METHODS

A validated survey of 585 eligible family or general internal medicine practices seeing ‡30 adult patients with diabetes in or near Minnesota during 2017 evaluated the presence of 62 SysCMs. From 419 (72%) practices completing the survey, NQF#0729 was determined in 396 (95%) from electronic health records, including 215,842 patients with type 1 or type 2 diabetes.

RESULTS

Three SysCMs were associated with higher rates of meeting performance targets across all practices: *1*) a systematic process for shared decision making with patients (*P* 5 0.001), *2*) checklists of tests or interventions needed for prevention or monitoring of diabetes (*P* 5 0.002), and *3*) physician reminders of guideline-based age-appropriate risk assessments due at the patient visit (*P* 50.002). When all three were in place, an additional 10.8% of the population achieved recommended performance measures. In subgroup analysis, 15 additional SysCMs were associated with better care in particular types of practices.

CONCLUSIONS

Diabetes care outcomes are better in primary care settings that use a patient-centered approach to systematically engage patients in decision making, remind physicians of age-appropriate risk assessments, and provide checklists for recommended diabetes interventions. Practice size and location are important considerations when redesigning delivery systems to improve performance.

Although nationally standardized quality measures have demonstrated improvement in diabetes care delivery, progress has been slow (1,2). The redesign of primary care delivery models provides an important focus forenhancing the quality ofdiabetes care provided in communities throughout the country (3,4). New models of care delivery, such as the patient-centered medical home (PCMH), promote prevention, active management, and care coordination to address the triple aim of improving population health, enhancing patient satisfaction, and reducing cost (4–8). The promise of the

[1]Department of Family Medicine and Community Health, University of Minnesota Medical School, Minneapolis, MN
[2]HealthPartners Institute, Minneapolis, MN
Corresponding author: Kevin A. Peterson, peter223@umn.edu

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PCMH has motivated legislatures to accelerate PCMH adoption in health care initiatives across the U.S. (9). By 2017, 44 states and the District of Columbia had passed or introduced at least 330 laws to define or encourage primary care PCMH transformation (10). The most common focus of reorganization in practices adopting the PCMH model was improvement in the delivery of diabetes care (3).

Although the conceptual principles of the PCMH are well established (9), operational definitions have varied widely, and the overall impact of PCMH redesign on diabetes outcomes has remained inconclusive (11). Binary evaluations of the presence or absence of PCMH certification contribute to mixed results in the literature by not distinguishing among the diverse systems of care management (SysCMs) that can be present in a practice. Other studies have focused on utilization-based process measures instead of clinical outcomes (10). As a result, important gaps exist in our understanding about which practice components promote improvement in outcomes and how practice factors may influence delivery model redesign (12). A better understanding is essential for identifying the services and resources in a practice that lead to improved diabetes outcomes and for determining whether new models provide consistent benefits across multiple settings and across diverse diabetes populations.

The Understanding Infrastructure Transformation Effects on Diabetes (UNITED) study takes advantage of a natural experiment in Minnesota following adoption of the PCMH model by the legislature in 2008 (13). This legislation linked state PCMH certification to public recognition and additional reimbursement. In addition, all Minnesota primary care practices were required to adopt electronic health records and report annual diabetes performance measures to a nonprofit organization, MN Community Measurement (MNCM). By 2017, 355 of the 585 primary care practices reporting to the MNCM from our identified cohort were certified as PCMH practices. We leveraged these mandates to identify associations between 2017 diabetes performance measures and commonly used primary care SysCMs. Our goal was to identify specific SysCMs that were associated with high-quality diabetes care to assist practices in focusing quality improvement and clinical redesign efforts.

RESEARCH DESIGN AND METHODS

Eligibility

All family medicine and general internal medicine practices reporting to MNCM for 2016 dates of service were eligible to participate. Practices were located in or near Minnesota and provided primary care services to Minnesota patients. Practices were required to report to MNCM if $ 30 patients with diabetes made a visit in 2016 to medical doctors, doctors of osteopathy, physician assistants, or advanced practice registered nurses.

Practice Survey Recruitment

We used a multilevel strategy to recruit participation in a practice survey evaluating the presence of SysCMs in the practice. Initially, we mailed a Federal Express letter to the medical directors of the 98 medical groups and independent practices providing performance measures to MNCM for the 585 eligible primary care practices. The letter was followed by a phone call from the investigators to explain the study, request participation, and establish contacts for further communication (K.A.P., L.I.S.). For the 53 medical groups (451 practices) agreeing to participate, an e-mail was sent within 1 week to confirm participation, define expectations and benefits, and request verification of the name and contact information of the local leader at each practice to complete the practice survey.

Once approval was obtained from the medical director, an e-mail was sent to the designated medical leader of each practice within 5 days with an electronic link to the Physician Practice Connections–Research Survey (PPCRS) (14). Nonrespondent practice leaders received an automated survey reminder at weeks 1, 2, and 3. E-mail reminders were sent to nonresponders by the project coordinator at weeks 4 and 5. On week 6, the medical group leader was asked to send another notification to the designated local practice leaders to remind them of the importance of completing the survey. On weeks 7 and 8, nonrespondents were called or e-mailed by the investigators asking whether further assistance was necessary (K.A.P., L.I.S.). Contact was stopped for persistent nonresponders at week 9.

Practice Survey Data

The 82-question PPCRS evaluated the presence of 62 general or diabetes SysCMsin the practice (see Supplementary Data). The survey instrument was created and tested for reliability by the National Committee for Quality Assurance as a way of assessing five chronic care model domains: clinical information systems, decision support, delivery system redesign, health care organization, and clinical quality improvement (15). These PPCRS domains do not directly address diabetes care but have been demonstrated to be associated with both quality of care and utilization measures for patients with diabetes (11,14,16). Previous testing demonstrates that respondents accurately report the presence of SysCMs, tending, if anything, to underreport the systems present (17).

Practice Characteristics

Primary care practices were categorized by *1*) diabetes panel size (the number of patients with diabetes in the practice), *2*) group size (the number of primary care practices owned by the medical group), and *3*) location (whether situated in an urban or a rural setting). Small practices were identified as having a diabetes panel of ,455 patients, approximating fewer than four full-time equivalent (FTE) providers (18). Group size was large if the practice was part of a group owning $12 primary care practices, medium if the group owned 2–11 practices, and small if the practice was a single site. Practice rurality was defined by mapping the practice's ZIP code to Rural-Urban Commuting Area codes and mapping these to urban or rural categories (https://depts.washington.edu/uwruca/ruca-maps.php). Practices designated as Federally Qualified Health Centers (FQHCs) were identified with an additional indicator.

Quality Reporting Data and Patient Characteristics

Participating practices submitted data on their entire population of adults with type 1 or type 2 diabetes. Patients were included if they were 18–75 years of age by 1 January 2017, had a diagnosis of diabetes, and had at least one face-to-face visit with an eligible provider for any reason during 2017. A diagnosis of diabetes was established by at least two visits in the measurement year or prior year that included a diabetes-related ICD-9 or ICD-10 code (see Supplementary Table 2 for ICD code value sets). Eligible exceptions from reporting included permanent nursing home residents, hospice or palliative care recipients, death during the measurement period, pregnancy, or documentation that an ICD code was in error.

The quality reporting data included anonymous patient-level data, including age, sex, diabetes type, comorbidities (depression, ischemic vascular disease), insurance type, ZIP code, primary care practice, and the latest result value and record date for *1*) A1C, *2*) systolic and diastolic blood pressure, *3*) statin use, *4*) tobacco use status, and *5*) use of aspirin or antiplatelet medication. The National Quality Forum (NQF)–Endorsed Maintenance Standard "Optimal Diabetes Care" (NQF#0729) was used to measure performance (19). This composite measure is defined as concurrent achievement of all of the following, using the latest available value during the measurement period: *1*) last A1C ,8.0%, *2*) last blood pressure ,140/90 mmHg, *3*) prescribed statin medication (unless allowed contraindications or exceptions were present), *4*) documentation within the past 2 years of being a tobacco nonuser, and *5*) prescribed daily aspirin or antiplatelet medication for a patient with ischemic vascular disease (unless allowed contraindications or exceptions were present).

Analysis

We matched 2017 performance data with 2017 PPCRS survey results using identifiable practice indicators. We matched the joined data to American Community Survey (ACS) data by patient residential ZIP code to capture ZIP code–level descriptors of each patient's neighborhood, including measures of racial distribution, income/education, and wealth. The wealth and income/education measures were computed from a factor analysis of income, housing, education, and family composition measures retrieved from 2015 5-year ACS data (details available from corresponding author). These factor analyses center nationwide variables at zero, with positive numbers indicating greater than national average wealth or income/education and negative numbers indicating less than average.

Statistical Framework

We used the merged data to determine the association between the SysCMs present in a practice and practice performance using the NQF#0729 measure. The outcome modeled was the response to the question: Did this patient achieve the NQF performance measure for 2017 in this practice? We used a logit framework to model the binary responses. Predictors of interest were the 62 individual SysCMs captured by the PPCRS. We controlled for patient variables of age (5-year increments), sex, the presence of ischemic vascular disease, the presence of depression, type of diabetes, and type of insurance coverage (commercial, Medicaid, Medicare, dual Medicare/Medicaid, and self-pay/uninsured). Inaddition, wecontrolled for group size, rurality, FQHC status, and descriptors of race/ethnicity, wealth, and income/education in the patients' ZIP codes from the ACS. We included practice-level random effects to correct for unobserved characteristics of a practice that may cause correlation in the outcome between patients.

Planned subgroup analysis of the principal outcome was by practice diabetes panel size, group size, and location. We used a Bonferroni correction for multiple comparisons, lowering significance to 0.015. The study was reviewed and approved by the University of Minnesota Human Research Protection Program.

RESULTS

From the 585 primary care practices eligible for the PPCRS, 451 (77%) agreed to participate in the study; 415 of these participating practices (92%) completed the PPCRS survey between 1 April and 30 October 2017. The 169 eligible practices that refused to participate or did not respond were more likely than responding practices to be a single site (11.2% vs. 2.3%), to be rural (58% vs. 34%), and to have a slightly lower diabetes performance score (NQF#0729 score of 42.1% vs. 45.8%). We subsequently obtained MNCM diabetes performance data for 2017 from 395 (95%) of the practices completing the PPCRS survey. Nineteen practices participating in the PPCRS did not provide 2017 performance data because of closure or change in reporting status.

Table 1 shows the characteristics of the 395 practices with 2017 MNCM and 2017 PPCRS data. Among the 133 rural practices included, 37 were located in large rural towns, 25 were in small rural towns, and 71 were in isolated rural towns. More than 71% of rural practices had a diabetes panel size that suggested fewer than four FTE providers. Since large practices were uncommon in rural markets, large and small rural practices were combined into a single rural subgroup for analysis. Although most practices overall (77%) were members of large medical groups, 2.3% were single-site practices and 20.8% were members of medium-sized groups.

Data included 215,842 individuals with type 1 or type 2 diabetes. Table 2 provides the patient demographics, comorbidities, type of insurance, and neighborhood characteristics for each practice type. Although population demographics at large urban and small urban practices were similar, rural practice patients were older, more likely to be on Medicare, and less ethnically diverse. Rural practice populations lived in neighborhoods with lower accumulated wealth, while income and education were lower among urban practice populations.

Among patients at all participating practices, 45.8% achieved NQF#0729 in 2017. In large urban, small urban, and rural practices, 46.8% (*n* 5 140,782), 45.8% (*n* 5 26,352), and 42.9% (*n* 5 50,486) achieved the performance measure, respectively (*P* , 0.001). Considering all clinic priorities over the next year, improving care for patients with diabetes was ranked by practice leaders to have an average priority of 8.5 (range 1–10, highest priority 10). This was a higher priority than depression (7.9), asthma (7.7), or cardiovascular disease (7.6) care.

Table 3 shows the three SysCMs associated with significant increases in achievement of NQF#0729 across all practices. The marginal effect represents the difference in the predicted percentage of the population with diabetes in a practice achieving the Optimal Diabetes Care measure when the SysCM was present. For example, in Table 3, the first SysCM had a marginal effect of -2.6 percentage points, demonstrating that an additional 2–3 individuals out of every 100 with diabetes achieved all recommended targets in the composite NQF#0729 measure when the SysCM was present as a component of the delivery system in the practice. Simultaneous adoption of all three management systems in Table 3 was associated with a 10.8 percentage point higher

Table 1—Practice demographics

	Total	Rural	Small urban	Large urban
Number of practices	395	133	118	144
Medical group size				
Large systems (. 1 2 practices)	304 (77.0)	91 (68.4)	92 (78.0)	121 (84.0)
Medium systems (2–11 practices)	82 (20.8)	41 (30.8)	20 (17.7)	21 (14.6)
Single site (1 practice)	9 (2.3)	1 (0.8)	6 (5.1)	2 (1.4)
FQHCs	12 (3.04)	3 (2.26)	3 (2.54)	6 (4.17)
Practice size: population with diabetes (provider FTE)[1]				
, 1 9 5 (1)	105 (26.6)	58 (43.6)	47 (39.8)	0.0
195–454 (2–3)	108 (27.4)	37 (27.8)	71 (60.2)	0.0
455–714 (4–5)	76 (19.2)	14 (10.5)	0.0	62 (41.3)
715–1,364 (6–9)	72 (18.2)	17 (12.8)	0.0	55 (38.2)
$1,365 ($10)	34 (8.6)	7 (5.3)	0.0	27 (18.7)

Data are *n* (%) unless otherwise indicated. [1]Estimated provider FTEs computed as panel size divided by 130, rounded to nearest unit.

rate of patients achieving all diabetes care targets. Although these SysCMs were associated with positive trends in every subgroup, they were not necessarily statistically significant in each subgroup analysis. Shared decision making had a greater impact in large practices, while providing reminders of age-appropriate risk assessments had a greater impact in small practices.

Table 2—Patient characteristics

	Total	Rural	Small urban	Large urban
Patients with diabetes, *n*	215,842	52,539	28,257	135,046
Age distribution (years)				
, 4 0	7.6	6.3	8.2	8.0
40–44	5.1	4.5	5.6	5.2
45–49	8.1	6.9	8.7	8.4
50–54	11.2	9.8	12.1	11.5
55–59	15.6	14.6	16.3	15.8
60–64	17.3	17.9	17.0	17.1
65–69	17.5	19.1	16.6	17.0
$70	17.8	20.9	15.7	17.0
Percent female	46.3	45.4	46.8	46.5
Insurance type				
Commercial	42.4	36.8	45.3	43.9
Medicaid	9.4	6.1	10.2	10.5
Medicare	37.2	44.8	34.1	34.8
Dual	4.3	5.7	4.1	3.9
Self-pay/uninsured	2.7	2.2	2.3	2.9
Unknown	4.1	4.5	4.0	3.9
Type 1 diabetes prevalence	6.2	5.3	6.0	6.6
Ischemic vascular disease prevalence	15.8	18.2	14.2	15.1
Depression prevalence	23.6	24.7	24.3	23.1
Neighborhood characteristics				
Income and education				
Mean (SD)	0.24 (0.57)	0.38 (0.39)	0.27 (0.59)	0.18 (0.61)
Range	24.69 to 1.63	24.69 to 1.63	23.18 to 1.26	24.14 to 1.63
Wealth factor				
Mean (SD)	0.35 (0.55)	0.01 (0.31)	0.48 (0.56)	0.46 (0.56)
Range	22.99 to 5.12	22.61 to 2.84	22.62 to 2.97	22.99 to 5.12
White, non-Hispanic (%)				
Mean (SD)	80.3 (16.8)	89.8 (10.2)	79.8 (17.1)	76.6 (17.3)
Range	0.9–100.0	1.1–100.0	1.5–100.0	0.9–100.0

Data are % unless otherwise indicated.

When we estimated these associations using the planned subgroups of diabetes panel size (practice size) and rurality, the marginal effects of SysCMs differed considerably. Table 4 presents all SysCMs associated with higher performance scores (*P* , 0.015) by subgroup. In large urban, small urban, and rural practices, eight, three, and six SysCMs, respectively, had significant associations with higher Optimal Diabetes Care scores. The remaining 36 SysCMs had no significant effect or a negative effect on diabetes quality measures in all groups (see Supplementary Table 1). In contrast to practice size and rurality, medical group size demonstrated no significant differences in the impact of SysCMs on the Optimal Diabetes Care measure (results not shown).

CONCLUSIONS

As primary care practices rapidly adopt new patient-centered delivery models to address the triple aim of improved population health, enhanced patient experience, and reduction in costs, it is important for those new models to focus on promoting SysCMs that most effectively improve clinical outcomes among patients with diabetes. The 395 practices completing this study represent . 7 0 % of the active primary care practices in and around Minnesota. These unusually comprehensive data provide an important natural experiment for evaluating the associations between components of care management regularly implemented by practices during PCMH redesign and the clinical outcomes of 215,842 patients with diabetes receiving care in these primary care settings. Practice performance is compared using the Optimal Diabetes Care measure, a composite diabetes measure of concurrent achievement of five recommended treatment goals that are independently demonstrated to reduce morbidity and/or mortality in diabetes (20–22). Although this composite measure does not include all components of preventive diabetes care, achievement of the NQF#0729 performance measure demonstrates that a patient has met several of the most important goals of diabetes care.

Demonstration projects and clinical trials that implement comprehensive system changes have previously demonstrated that improvements in diabetes care are possible (9,18,23,24).

Table 3—SysCMs associated with higher probability of patient achievement of NQF#0729 performance measure among all practices

Marginal effect (%)	SysCM	*P* value
12.6	A systematic process to conduct shared decision making with patients (E1)	0.001
13.2	Checklists of tests or interventions that are needed for prevention or monitoring of chronic illness, including diabetes (C15)	0.003
15.0	Guideline-based reminders of age-appropriate risk assessments (e.g., smoking, depression screening) that the patient should receive at the visit (C33)	0.005
110.8	Combined impact of all three services	,0.001

Parentheticals identify question on survey.

However, the costs to a practice of comprehensive change present an obstacle to widespread adoption. In addition, complex changes tested within one medical group may not generalize to other practice settings where case mix and local or community resources vary (8,15,25). Previous demonstrations have suggested that PCMH redesign is slower and more complex than initially envisioned (22). A wide variety of clinical services are available that offer meaningful change, but even among practices that successfully adopt new components of care management, significant improvements in diabetes performance may lag by 1 or 2 years (26). A better understanding of the SysCMs that are most important in driving better clinical outcomes is essential for guiding incremental change.

Our study demonstrates that three SysCMs are consistently associated with higher performance in the delivery of diabetes care across all practice types.

Adoption of all three SysCM components shown in Table 3 was associated with 11 more individuals concurrently achieving multiple recommended clinical targets for every 100 patients with diabetes in the practice. Adoption of these three SysCMs by primary care practices across the U.S. could potentially improve important clinical measures for 3.3 million individuals with diabetes. Practices in Minnesota have been working on improving diabetes care for .10 years and have among the highest performance rates in the country, with a mean NQF#0729 performance score of 46%. In Minnesota, from the perspective of practice management, the additional 10.8 percentage point improvement associated with these three interventions would alter publicly reported performance scores from the 50th percentile to the top 10% of practices. Adoption of these SysCMs in areas of the country where performance rates are lower could be expected to have an even greater impact than that demonstrated in Minnesota. It is unclear whether such transformational changes would be widely accepted by providers or by patients in the absence of legislative incentives.

A joint American Diabetes Association–European Association for the Study of Diabetes consensus statement has recently recommended that providers and health care systems prioritize the delivery of patient-centered care (27) for patients with diabetes, since shared decision making helps to clarify congruence between decisions and personal values (28,29). Our study is among the first to demonstrate that practices implementing systematic shared decision making are also more successful in achieving clinical targets for their patients with diabetes. Despite diverse settings, populations, and practice characteristics, shared decision making improved practice performance in diabetes care.

The other two SysCMs in Table 3 are physician reminders that provided notification of risk assessments due at the time of a patient visit and checklists of recommended diabetes tests and interventions due at the visit. The implementation of provider reminders can present many challenges to culture and workflow. In the time-limited and stressful environment of primary care, however, the ability of reminders and checklists to improve prospective memory provides a valuable similarity to methods proven to be helpful in other high-reliability organizations (30). In this study, provider reminders of tests required for diabetes management and reminders of nondiabetes-related age-appropriate risk assessments both independently improved aggregate diabetes outcomes.

Although the SysCMs in Table 3 had positive impacts on all practice types, the impacts of other SysCMs varied substantially in different types of practices. A closer evaluation of Table 4 provides an interesting perspective on how location and practice size alter the impact of different interventions. Adopting written evidence-based standards and building designated primary care teams were associated with improved performance scores in large urban practices but had no impact in small urban or rural practices. Possible interpretations are that in small practices, written standards may play a limited role in communication and that most available staff members are already part of the designated primary care team in a practice with fewer than four providers. Conversely, providing electronic self-monitoring and supporting transmission of data to the practice were associated with significantly higher scores in rural practices but not in large or small urban practices. Support for this type of data exchange may address challenges found more commonly in rural than in urban settings. Of note, the number of practices in a medical organization (group size) had no significant association with how SysCMs affected performance. Overall performance varied only slightly among large urban, small urban, and rural practices.

By clarifying the components of primary care delivery that drive change in clinical outcomes, the data reveal additional insights into the nature of primary diabetes care delivery. Of note, several SysCMs associated with better diabetes performance did not focus on diabetes at all but supported improved access or promoted general medical preventive strategies. In addition, small and rural practices had a larger number of SysCMs identified as significantly improving care than large practices, suggesting greater flexibility than for large practices in planning for effective redesign.

The study has limitations. This study does not address the impact of SysCMs on cost or utilization. Ongoing investigations of these are currently under way. The study focuses on diabetes and does not address the effect of SysCMs on other

Table 4—SysCMs associated with a higher probability of patient achievement of NQF#0729 performance measure by practice type

Location	Marginal effect (%)	SysCM	*P* value
Large urban	14.7	Checklists of tests or interventions that are needed for prevention or monitoring of chronic illness, including diabetes (C15)	0.001
	13.5	A systematic process to conduct shared decision making with patients (E1)	0.001
	13.1	Routine support of self-management for patients and their families through an interactive Web site sponsored by one's organization (D20)	0.003
	111.2	Combined impact of all three SysCMs	
Small urban	112.6	A system to identify and notify patients who are due for age-appropriate clinical preventive services (e.g., immunizations, colonoscopy, mammography) (C35)	,0.001
	16.5	Advanced access or open access visits (scheduling that encourages office staff to offer same-day appointments to virtually all patients who want to be seen) (C11)	,0.001
	16.4	Onsite nonphysician staff available for patient care who are specially trained and designated to educate patients in managing their diabetes (C17)	,0.001
	14.9	Development of care plans with patients for medically complex conditions (E2e)	,0.001
	19.6	A systematic approach to identify and remind patients with chronic illnesses who are due for a follow-up visit (C23)	0.001
	14.4	A system to identify patients at high risk for hospitalizations and/or emergency department visits (G1)	0.006
	18.0	Guideline-based reminders of age-appropriate risk assessments (e.g., smoking, depression screening) that the patient should receive at the visit (C33)	0.006
	148.7	Combined impact of all seven SysCMs	
Rural	117.4	Provide or refer to classes or programs for weight management (D8)	,0.001
	14.9	Previsit planning by nonphysician staff for patients with diabetes (C27)	0.003
	14.9	Use of a questionnaire or assessment tool to assess symptoms, interest in changing risk factors, or self-care behavior in patients with diabetes (C16a)	0.004
	115.6	Systematic process to screen or assess patients for smoking/tobacco use (D1)	0.006
	19.2	Guideline-based reminders of age-appropriate risk assessments (e.g., smoking, depression screening) that the patient should receive at the visit (C33)	0.006
	13.5	Provision of electronic self-monitoring or transmission of data to the practice (D21)	0.006
	115.6	Provision of data to individual physicians on the quality of their care for patients with diabetes (F2)	0.010
	19.7	A systematic approach to identify and remind patients with chronic illnesses who are due for a follow-up visit (C23)	0.012
	151.2	Combined impact of all eight SysCMs	

Parentheticals identify question on survey.

diseases or on other competing demands in a primary care practice. Forty-four common SysCMs demonstrated no impact or a negative impact on diabetes outcomes and are listed in Supplementary Table 1. These SysCMs may have provided value to the practice or to patients in other ways that we did not measure. Finally, the current evaluation is cross-sectional and demonstrates association, not causation. We are currently building longitudinal data to better understand causal relationships. Although the data set is large and includes diverse practice settings, characteristics, and populations, we do not know whether impacts will similarly generalize to primary care practices in other geographic areas.

In summary, we found that three primary SysCMsdshared decision making, risk assessment reminders, and checklists for diabetes monitoringdwere consistently associated with better performance in achieving Optimal Diabetes Care across all practices. Performance improvement associated with 15 other SysCMs depended on size and rurality of the practice. Group size did not influence the impact of SysCMs on performance. The influences of practice size and location are additional important considerations when applying PCMH models to improve performance in primary care practices.

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Redesigning Primary Care to Improve Diabetes Outcomes (the UNITED Study)

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Question 1:
What is the reason/s why, one would want to redesign one's approach Primary Care diabetic care delivery?

a. ***To improve primary care level cost-efficiency.***
b. ***To decrease the use of inappropriate use of insulin.***
c. ***To drive diabetic care-escalation to specialist endocrinologists.***
d. ***To enhance the quality of diabetes care provided in communities and improve diabetic outcomes***

Question 2:
The following list of three care components, or Systems of Care Management (SysCMs), were associated with higher probability of patient achieving the performance measure amongst all practices measured. Which of the options below should a doctor introduce into day-to-day chronic care?

1. ***A systematic process to conduct shared decision making with patients***
2. ***Checklists of tests or interventions that are needed for prevention or monitoring of chronic illness, including diabetes.***
3. ***Guideline-based reminders of age-appropriate risk assessments (e.g., smoking, depression screening) that the patient should receive at the visit.***

Question 3 :

Which of the following ideals are included in the newer delivery models in Diabetic care

1. ***Improved population health,***
2. ***Enhanced patient experience,***
3. ***Reduction in costs,***
4. ***improve clinical outcomes***

Question 4:

Common systems of care management (SysCMs) identified certain modalities which when combined showed the most dramatic improvement in patient outcomes .

Please identify which modalities these were :

1. ***A systematic process to conduct shared decision making with patients***
2. ***Checklists of tests or interventions needed for prevention or monitoring of chronic illness, including diabetes***
3. **Guideline-based reminders of age-appropriate risk assessments (e.g., smoking, depression screening) that the patient should receive at the visit**
4. **Reminders to physicians of age-appropriate risk assessments,**
5. **Provision of checklists for recommended diabetes interventions.**

Question 5

In the article Redesigning Primary Care to Improve Diabetes Outcomes, Practice performance is compare using a scoring measurement tool which demonstrates that a patient has met several of the most important goals of diabetes care. . What was this tool called?

1. **Diabetic management scoring for GPs**
2. **The Optimal Diabetes Care measure**
3. **Managing Diabetics in General Practice**
4. **Composite Diabetes measures for reference**
5. **Family approaches to Diabetic measurement**