Communication and Medication Refill Adherence

The Diabetes Study of Northern California

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Background: Poor medication refill adherence contributes to poor cardiometabolic control and diabetes outcomes. Studies linking communication between patients and health care providers to adherence often use self-reported adherence and have not explored differences across communication domains or therapeutic indications.

Methods: To investigate associations between patient communication ratings and cardiometabolic medication refill adherence, we conducted a cross-sectional analysis of 9377 patients in the Diabetes Study of Northern California (DISTANCE), a race-stratified, random sample of Kaiser Permanente survey respondents. Eligible participants received 1 or more oral hypoglycemic, lipiddowering, or antihypertensive medication in the 12 months preceding the survey. Communication was measured with a 4-item Consumer Assessment of Healthcare Providers and Systems Survey (CAHPS) score and 4 items from the Trust in Physicians and Interpersonal Processes of Care instruments. Poor adherence was classified as greater than a 20% continuous medication gap for ongoing medication therapies. Using modified least squares regression, we calculated differences in poor adherence prevalence for a 10-point decrease in CAHPS score and compared higher vs lower communication ratings on other items, adjusting for necessary sociodemographic and medical confounders derived from a directed acyclic graph.

Results: In this cohort, 30% had poor cardiometabolic medication refill adherence. For each 10-point decrease in CAHPS score, the adjusted prevalence of poor adherence increased by 0.9% (P = .01). Compared with patients offering higher ratings, patients who gave health care providers lower ratings for involving patients in decisions, understanding patients’ problems with treatment, and eliciting confidence and trust were more likely to have poor adherence, with absolute differences of 4% (P = .04), 5% (P = .02), and 6% (P = .03), respectively. Associations between communication and adherence were somewhat larger for hypoglycemic medications than for other medications.

Conclusions: Poor communication ratings were independently associated with objectively measured inadequate cardiometabolic medication refill adherence, particularly for oral hypoglycemic medications. Future studies should investigate whether improving communication skills among clinicians with poorer patient communication ratings could improve their patients’ cardiometabolic medication refill adherence and outcomes.


See Invited Commentary at end of article

Persons with diabetes mellitus are at high risk for cardiovascular morbidity and mortality. Hypoglycemic, antihypertensive, and lipid-dowering medications are important tools for reducing cardiovascular risk in people with diabetes. Poor medication refill adherence contributes significantly to suboptimal cardiometabolic control and poor clinical outcomes.

One proposed strategy for enhancing medication refill adherence is improving communication between patients and health care providers. Systematic reviews suggest that patient and provider communication behaviors affect the quality of information exchange and of primary care relationships. In the short term, patient-centered communication can enhance patient trust and may enable clinicians to incorporate patient preferences, needs, and values into treatment decisions. Both patient trust and shared decision making may then increase patient treatment adherence, ultimately improving patient outcomes. Thus, the Institute of Medicine designated patient-
centeredness as a core measure for health care quality, and validated metrics of health care provider communication are increasingly available for individual clinicians and health systems.

Prior research has suggested that collaborative communication is associated with better adherence. However, research using self-reported medication refill adherence measures may overestimate adherence across sociodemographic characteristics (eg, cultural differences in social desirability). Also, research using self-reported measures for both communication and adherence may be affected by endogeneity bias; eg, depression could be associated with poor patient perceptions of both communication and their own adherence. In addition, although shared decision making and trust may each affect adherence, validated instruments to measure these aspects of communication could yield insights about their relative importance. Finally, because patients’ beliefs about medication benefits and adverse effects can differ across therapeutic indications, the importance of communication to patients’ adherence could differ for specific types of medications.

This study investigated whether patient assessments of health care provider communication were associated with objective measures of poor adherence for cardiometabolic medications using pharmacy utilization data among a diverse sample of fully insured persons with diabetes. We hypothesized that poorer patient ratings of overall communication, shared decision making, and trust would be associated with poor adherence to cardiometabolic medications.

METHODS

We analyzed data from the Diabetes Study of Northern California (DISTANCE) Survey, conducted May 2005 to December 2006 among a racially and ethnically stratified sample of 20,188 Kaiser Permanente Northern California patients with diabetes, aged 30 to 75 years (response rate, 62%). Respondents completed the written or web survey in English or via telephone interviews offered in English, Spanish, Chinese, or Tagalog languages.

For this analysis (Figure 1), eligible participants answered questions about patient-provider communication (not included in the Short Version of the DISTANCE survey), reporting having a primary care provider, and were dispensed 1 or more oral hypoglycemic, antihypertensive, or lipid-lowering medication in the 12 months preceding the survey. We excluded subjects who changed their primary care provider, lacked continuous pharmacy benefits, or had insufficient dispensing (<2 fills) of medications to calculate adherence.

This study was approved by institutional review boards of Kaiser Permanente Northern California and the University of California, San Francisco.

MEASURES

The primary exposures were key domains for patient-reported quality of patient-provider communication (Table 1):

- Overall communication quality: Four items on the health care provider communication subscale of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey. We modified “explain things in a way that was easy to understand” to “explain things (directly or through an interpreter) in a way you could understand” to capture the experiences of non-English-speaking patients. The Cronbach α for internal consistency of this modified scale was .80.

- Shared decision making: Two items from the Interpersonal Processes of Care Instrument (IPC). We modified “did doctors ask if you would have any problems following what they recommended” to “did your personal physician seem to understand the kinds of problems you have in carrying out recommended treatments.”

- Trust: Two items from the Trust in Physicians Scale (TIPS).

Response options for both the IPC and TIPS items were modified to match the 4-point CAHPS scale options of “never,” “sometimes,” “usually,” and “always” during the preceding 12 months. Respondents could indicate that they had no visits or no problems for the IPC items.

We calculated a summary CAHPS score (range, 0-100, with 100 reflecting more positive experiences) by linearly transforming and then averaging CAHPS responses. Because of space limitations, the survey included 4 single-item questions from the full IPC and TIPS instruments; thus, we examined these 4 items separately, dichotomized at “always”/“usually” vs “sometimes”/“never,” a common cutoff for patient communication ratings.

The primary outcome was poor refill adherence measured by the continuous medication gap (CMG), a well-established measure of secondary adherence (adherence among ongoing users) using pharmacy utilization data. The CMG sums the proportion of days without sufficient medication supply across refill intervals between the first pharmacy dispensing during the measurement period and the last dispensing before censoring or the end of the measurement period, whichever occurs first. For patients taking more than 1 drug in the same therapeutic class, the proportion of time without medications is calculated individually for each therapeutic class, and then a
summary measure is created for each drug class.35,36 We use a modified approach that accounts for stockpiling medications using a time-forward algorithm.37 Because flexible insulin dosing prohibits calculation of a fixed days’ supply, we excluded insulin prescription refills from CMG calculations. For each subject, we calculated CMG for all indications combined and separately (CMG for antihypertensive medications only, lipid-lowering medications only, and diabetes medications only).35,36 We classified respondents as poorly adherent when they had no medication supply for more than 20% of the observation time and adherent when medications were available for 80% or more of the time.35,36

We assessed sociodemographic and medical characteristics using survey and medical record data,26 including age, sex, self-reported race/ethnicity, educational attainment, English language proficiency,36-38 functional health literacy,39,40 income, depression,41 external locus of control,42 and conscientiousness.43-45 We also calculated the Deyo version of the Charlson comorbidity index using a 2-year prebaseline capture for the diagnostic and procedure codes48,49 and copayment requirements, defining higher copayments for generic drugs (>$10), brand drugs (>$30), and outpatient visits (>$20).

**STATISTICAL ANALYSIS**

Our modeling was guided by a directed acyclic graph, which depicts causal relationships between measured variables in the analysis (Figure 2). Directed acyclic graphs help avoid errors caused by confounding, blocking (adjustment for a variable on a causal pathway between exposure and outcome), and colliding (adjusting for variables affected by both exposure and outcome, leading to spurious associations).50,51 We reviewed existing literature and theory about causal relationships and temporal ordering among patient, health care provider, relationship, and system variables that could affect the relationship between communication and medication refill adherence.52,53 We used established rules for determining the necessary covariates to estimate the direct effect of communication on medication refill adherence (Figure 2). A sensitivity analysis including number of medications for chronic conditions did not affect the point estimates for our analyses, suggesting that this variable’s exclusion based on the directed acyclic graph was correct.

We weighted all multivariable analyses by the inverse of the nonproportional sampling fractions for each race/ethnic group to account for the stratified sampling design. We also addressed survey nonresponse bias using the Horvitz-Thompson approach, modeling the probability of response to the DISTANCE (The Diabetes Study of Northern California) survey and creating individual weights (reciprocal of the probability of the observed response) for all multivariable models.63 Using modified least squares regression,63 we calculated the mean absolute prevalence of poor refill adherence for respondents with CAHPS scores of 100 and the unadjusted and adjusted change in prevalence with CAHPS as a continuous predictor. For the other communication items, we calculated the mean absolute prevalence of poor refill adherence for respondents with poorer vs better communication ratings and calculated unadjusted and adjusted prevalence differences. We also calculated the unadjusted and adjusted relative risk (RR) of poor refill adherence for those with higher vs lower communication ratings using modified Poisson regression.63

**RESULTS**

**PARTICIPANTS**

Among 9377 eligible respondents, 7303 were prescribed hypoglycemic medications, 7052 were prescribed lipid-lowering medications, and 7967 were prescribed antihypertensive medications (Figure 1). The mean (SD) age was 59.5 (9.8) years, and 52% were women. One-quarter (27%) were white, 19% African American, 16% Latino, 12% Asian, 11% Filipino, and 11% multiracial
Thirty-five percent earned less than $50,000 per year, 42% had high school or less educational attainment, and 38% had limited health literacy. Forty-four percent had Charlson comorbidity index scores of 2 or higher, and 45% had a hemoglobin A1c level higher than 7.0%. Patients were dispensed a mean (SD) of 5.2 (2.5) cardiometabolic medications (excluding insulin) and had seen their primary care providers for a mean (SD) of 6.2 (4.4) years.

### RATINGS OF THE QUALITY OF COMMUNICATION WITH CLINICIANS

The CAHPS scores were skewed, with 77% of respondents having the maximum score of 100. Low ratings were given by patients for health care providers involving patients in making decisions (20%), eliciting confidence and trust (8%), understanding patients’ problems carrying out recommended treatments (11%), putting patients’ needs first (12%), and showing respect (7%) (Table 1).

### DIFFERENCES IN MEDICATION REFILL ADHERENCE

Overall, 30% of respondents had poor adherence to their cardiometabolic medication regimens (CMG ≥20% for regimens of ≥1 cardiometabolic medication). Poor adherence was observed in 20%, 21% and 25% of patients for antihypertensive, lipid-lowering, and oral hypoglycemic medications respectively.

The mean absolute prevalence of poor refill adherence for all cardiometabolic medications combined was 27% (95% CI, 25%-29%) for patients with CAHPS scores of 100. For each 10-point decrease in CAHPS score, the unadjusted prevalence of poor refill adherence increased by 1.6% (95% CI, 0.9%-2.3%) (P < .001). Poor refill adherence for all cardiometabolic medications combined was associated with lower patient ratings on each IPC and TIPS item (unadjusted absolute differences ranging from 8% to 11%; all P < .001) (Table 3). Compared with patients reporting higher ratings, the unadjusted RR of poor cardiometabolic refill adherence for patients with lower communication ratings ranged from 1.16 to 1.36 (all P < .001).

After adjusting for potential confounders, the prevalence of poor refill adherence increased by 0.9% (95% CI, 0.2%-1.7%) (P = .01) for each 10-point decrease in CAHPS score. Compared with patients offering higher ratings, patients who gave lower ratings for health care providers’ involving patients in decisions, understanding patients’ problems with treatment, and eliciting confidence and trust were more likely to have poor adherence, with absolute differences of 4% (95% CI, 0%-7%) (P = .04), 5% (95% CI, 1%-10%) (P = .02), and 6% (95% CI, 1%-11%) (P = .03), respectively (Table 3). Those with lower communication ratings had higher adjusted RR of
Table 2. Characteristics of a Cohort of 9377 Patients With Diabetes Prescribed at Least 1 Cardiometabolic Medication

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Valuea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean [SD], y</td>
<td>59.5 [9.8]</td>
</tr>
<tr>
<td>Female</td>
<td>4530 (51.7)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2565 (27.4)</td>
</tr>
<tr>
<td>African American</td>
<td>1740 (18.6)</td>
</tr>
<tr>
<td>Latino</td>
<td>1509 (16.1)</td>
</tr>
<tr>
<td>Asian</td>
<td>1119 (11.9)</td>
</tr>
<tr>
<td>Filipino</td>
<td>1018 (10.9)</td>
</tr>
<tr>
<td>Multiracial</td>
<td>1027 (11.0)</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>399 (4.3)</td>
</tr>
<tr>
<td>Married</td>
<td>6551 (70.4)</td>
</tr>
<tr>
<td>Income, $</td>
<td></td>
</tr>
<tr>
<td>&lt;25 000</td>
<td>1431 (6.9)</td>
</tr>
<tr>
<td>25 000-49 999</td>
<td>2393 (28.3)</td>
</tr>
<tr>
<td>50 000-79 999</td>
<td>2219 (26.3)</td>
</tr>
<tr>
<td>$80 000</td>
<td>2411 (28.5)</td>
</tr>
<tr>
<td>Generic drug copay &gt; $10</td>
<td>135 (1.4)</td>
</tr>
<tr>
<td>Brand drug copay &gt; $30</td>
<td>530 (5.7)</td>
</tr>
<tr>
<td>Outpatient visit copay &gt; $20</td>
<td>9377 (7.4)</td>
</tr>
<tr>
<td>Educational attainment</td>
<td></td>
</tr>
<tr>
<td>No degree</td>
<td>1224 (13.3)</td>
</tr>
<tr>
<td>High school/GED</td>
<td>2641 (28.7)</td>
</tr>
<tr>
<td>Some college</td>
<td>2407 (26.1)</td>
</tr>
<tr>
<td>College graduate</td>
<td>2940 (31.9)</td>
</tr>
<tr>
<td>Limited health literacy</td>
<td>3567 (38.1)</td>
</tr>
<tr>
<td>Limited English language proficiency,</td>
<td>648 (7.0)</td>
</tr>
<tr>
<td>written or spoken</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>1894 (22.8)</td>
</tr>
<tr>
<td>Moderate to severe</td>
<td>1070 (12.9)</td>
</tr>
<tr>
<td>Low sense of personal control</td>
<td>1050 (11.4)</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>7579 (81.6)</td>
</tr>
<tr>
<td>Charlson comorbidity index score</td>
<td></td>
</tr>
<tr>
<td>&lt;1</td>
<td>4198 (44.8)</td>
</tr>
<tr>
<td>1 to &lt;2</td>
<td>2943 (31.4)</td>
</tr>
<tr>
<td>2 to &lt;3</td>
<td>1119 (11.9)</td>
</tr>
<tr>
<td>=3</td>
<td>1117 (11.9)</td>
</tr>
<tr>
<td>Hemoglobin A1c, &gt; 7.0%</td>
<td>4212 (44.9)</td>
</tr>
<tr>
<td>SBP &gt; 130 mm Hg</td>
<td>4044 (43.1)</td>
</tr>
<tr>
<td>DBP &gt; 80 mm Hg</td>
<td>2018 (21.5)</td>
</tr>
<tr>
<td>LDL-C ≥ 100 mg/dL</td>
<td>2794 (29.8)</td>
</tr>
<tr>
<td>Insulin use (before baseline)</td>
<td>2199 (23.5)</td>
</tr>
<tr>
<td>Medications, mean [SD], No.</td>
<td></td>
</tr>
<tr>
<td>Total medications</td>
<td>5.2 [2.5]</td>
</tr>
<tr>
<td>Cardiometabolic medications</td>
<td>4.5 [1.8]</td>
</tr>
<tr>
<td>Diabetes medications</td>
<td>1.6 [0.9]</td>
</tr>
<tr>
<td>Lipid-lowering medications</td>
<td>0.9 [0.5]</td>
</tr>
<tr>
<td>Hypertension medications</td>
<td>2.0 [1.3]</td>
</tr>
<tr>
<td>Years with PCP, mean [SD]</td>
<td>6.2 [4.4]</td>
</tr>
</tbody>
</table>

Abbreviations: DBP, diastolic blood pressure; GED, general equivalency diploma; LDL-C, low-density lipoprotein cholesterol; PCP, primary care provider; SBP, systolic blood pressure.

SI conversion factor: To convert cholesterol to millimoles per liter, multiply by 0.0259.

a Values are given as number (percentage) of patients unless otherwise specified.

In this study of a racially and ethnically diverse primary care population with diabetes, patient perceptions of poorer communication with their health care providers were associated with higher prevalence of poor secondary adherence to cardiometabolic medications. These findings are consistent with prior studies about aspects of patient-provider communication and medication refill adherence in diabetes and other chronic medical conditions. In a cross-sectional diabetes study, older patients’ evaluations of how well their physicians provided information on their illness and treatment were associated with patient self-reported medication-taking behaviors. A study in the Kaiser Permanente population found that a greater proportion of patients who did not initiate insulin therapy believed that their health care providers inadequately explained the risks and benefits of insulin, compared with those who initiated insulin therapy. Another Kaiser Permanente study found that language concordance for Spanish-speaking patients and race concordance for African Americans were associated with higher rates of cardiometabolic medication refill adherence, although it did not assess patient ratings of communication directly.

This study adds to the literature in a number of ways. First, unlike most prior studies, we used a validated, objective measure of secondary medication refill adherence—pharmacy utilization for medication refills—to demonstrate an association with patient ratings of health care provider communication. Self-reported medication refill adherence has varying concordance with objective measures of adherence and may be subject to social desirability bias. A systematic review found that self-reported adherence was highly concordant with claims data in only 5 of 11 applicable studies. Also, sociodemographic characteristics such as sex and education have been associated with differences in the degree of patients’ overreporting of adherence.

Second, our findings suggest modest differences in the associations between patient ratings of communication and medication refill adherence across therapeutic indications. Oral hypoglycemic medications had both higher rates of poor refill adherence and somewhat stronger associations with patient-provider communication in ad-
Patient-centered communication behaviors are trust, and shared decision making to medication refill adherence.7 Patient-centered communication, treatment patient disclosure of nonadherence, allowing prob-

The complexity, adverse effects, or perceived benefits of oral hypoglycemic medications may make patients’ adherence more “sensitive” to the contributions of patient-provider communication. A focus group study of oral diabetes medication therapy initiation and intensification found that patients viewed medication therapy initiation as “evidence of personal failure and an increased burden” and viewed medication therapy intensification as increasing their risk of diabetes-related complications, preferring deescalation as their primary treatment goal.30,31 Similar mixed-methods studies to explore how persons with diabetes perceive different medications could offer patient-centered insights on how health beliefs influence medication refill adherence and whether their relationships with health care providers influence adherence differently.

Medication refill adherence is associated with better cardiometabolic control and reduced morbidity and mortality among those with diabetes at the highest risk for cardiovascular events.5,7,11 Our findings support proposed pathways from patient-centered communication, trust, and shared decision making to medication refill adherence.7 Patient-centered communication behaviors are core strategies by which clinicians engender patient trust, which enhances patients’ adherence by promoting self-efficacy and moderating the negative effects of financial barriers to adherence.12,25,66,71 Patient-centered communication also allows clinicians to activate and engage patients in self-management through collaborative goal setting and action planning, which can improve diabetes self-care, medication refill adherence, and ultimately cardiometabolic control.72-75

Patient-centered communication may also foster shared decision making about medications. Clinicians often fail to predict inadequate medication refill adherence,6,7,16 which may represent passive disagreement to clinicians’ prescribing decisions. Patient-centered communication may allow acknowledgment and reconciliation of the different ways patients and clinicians view medication risks and benefits.67,69,78,80 Skilled clinicians may also facilitate patient disclosure of nonadherence, allowing prob-

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean Absolute Prevalence Rates of Poor Refill Adherence, % (95% CI)a</th>
<th>Unadjusted Prevalence Difference</th>
<th>Adjusted Prevalence Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involved you in decisionsb</td>
<td>35 (32 to 38)</td>
<td>8 (4 to 11)</td>
<td>4 (0 to 7)</td>
</tr>
<tr>
<td>Understood your problems with treatmentb</td>
<td>38 (33 to 42)</td>
<td>11 (6 to 15)</td>
<td>5 (1 to 10)</td>
</tr>
<tr>
<td>Put your needs firstc</td>
<td>37 (33 to 41)</td>
<td>8 (4 to 13)</td>
<td>4 (1 to 8)</td>
</tr>
<tr>
<td>Confidence/trust in PCPd</td>
<td>39 (34 to 44)</td>
<td>11 (6 to 16)</td>
<td>6 (1 to 11)</td>
</tr>
</tbody>
</table>

Abbreviations: CAHPS, Consumer Assessment of Healthcare Providers and Systems Survey; PCP, primary care provider.

aWeighted to account for the survey design’s nonproportional sampling as well as survey nonresponse.
bAdapted from the Trust in Physicians Scale.30,31
c“Never” or “sometimes.”
d“Usually” or “always.”
eAdapted from the Interpersonal Processes of Care Instrument.29
fAdapted from the Trust in Physicians Scale.30,31

Table 3. Differences in Prevalence of Poor Refill Adherence for Any Cardiometabolic Medication by Ratings of Communication With Clinicians in a Cohort of 9377 Patients With Diabetes

Overall, our results suggest patients’ communication ratings are modestly predictive of inadequate medication refill adherence, with adjusted absolute prevalence differences of 4% to 6% and RR differences of 7% to 16%. The largest differences in adherence occurred between ratings of “usually” and “sometimes,” suggesting a conceptually meaningful difference in patients’ perceptions at this cutoff. It is unclear to what extent patient-provider communication is modifiable, and if so, whether improvements in a given health care provider’s communication will lead to improved adherence among that provider’s patients. Cooper et al6 developed an intensive training program using personalized feedback from videotaped simulations of patient encounters to enhance clinicians’ skills in patient engagement, activation, and empowerment. While the training was associated with greater improvements in patients’ reports of physicians’ participatory decision making and patient involvement in care, it was not associated with improvements in patients’ antihypertensive medication refill adherence or blood pressure control. On the basis of our findings, it is possible that targeting clinicians with poorer patient communication ratings or focusing on specific skills related to shared decision making and trust for hypoglycemic medications may offer higher yields.

This study has limitations. First, patient ratings of health care provider communication may be subject to recall bias. Second, CMG is only 1 measure for refill adherence to medications and excludes those who are not ongoing users.3 Because discontinuation is assumed to occur after the last dispensing and stockpiled medications have been exhausted, person-time is censored and poor refill adherence after discontinuation is not captured by CMG. Also, CMG does not evaluate early stages of adherence for newly prescribed medications (primary nonadherence). However, CMG remains the most valid measure of adherence to long-term medication therapies and should have good correlation with other measures in an integrated health care delivery system that includes its own pharmacies.3,5,17,18,35,36 Third, owing to limi-
tations of available pharmacy utilization data, we were unable to measure insulin therapy adherence, an important outcome given challenges with insulin therapy initia-
tion and adherence.67,78 Fourth, the cohort excludes patients who changed health care providers, a group that may include members who rated their providers' commu-
nication more poorly. Fifth, our findings from this cross-sectional analysis may be due to unmeasured con-
founding or reverse causation (eg, patients' poor refill ad-
herence to medications leading to challenging conversa-
tions with health care providers). Our analysis is strength-
ened by capturing and adjusting for several poten-
tial confounders from existing literature, but given the complex interrelationships between communication, ad-
herence, medication therapy intensification, and cardio-
metabolic outcomes, future prospective, mixed-
methods observational studies using rigorous causal analytic methods would be valuable. Sixth, the study co-
hort was a fully insured population receiving care in an integrated health delivery system, and findings may not be generalizable to other patient populations (eg, the uninsured). However, this population provides a reason-
able model of expectations if and when the Patient Pro-
tection and Affordable Care Act is fully implemented.81
Concerns for confounding by some systemic and finan-
cial barriers to adherence are reduced in this insured popu-
lation with continuous prescription medication coverage,
and this study is strengthened by the study population's diversity, including 73% nonwhite minori-
ties and 42% with high school education or less. Fi-
ally, although this study focuses on patient ratings of health care providers, interventions to promote adherence should also consider empowering patients to commu-
cnicate more effectively with clinicians, eg, by disclos-
ing their desires not to start or intensify medication therapies before they are prescribed.67,79,82
In conclusion, poor patient ratings of health care pro-
vider communication were independently associated with objectively measured, inadequate cardiometabolic med-
cation refill adherence, particularly for oral hypoglyce-
mic medications. Future studies should investigate whether targeting communication interventions for cli-
nicians or health systems with poorer patient communica-
tion ratings may improve medication refill adherence and ultimately clinical outcomes.

Accepted for Publication: July 2, 2012
Published Online: December 31, 2012. doi:10.1001
/jamainternmed.2013.1216
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tion of data: Karter, Parker, Moffet, Adler, and Schil-
linger. Analysis and interpretation of data: Ratanawa-
ongsa, Karter, Parker, Lyles, Adler, and Schillinger.

Drafting of the manuscript: Ratanawongsa and Waron.

Critical revision of the manuscript for important intel-
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ysis: Ratanawongsa, Parker, Lyles, and Waron. Obtained
funding: Karter and Schillinger. Administrative, tech-
nical, and material support: Heisler, Moffet, and Adler. Study
supervision: Karter and Schillinger.

Conflict of Interest Disclosures: None reported.

Funding/Support: Funding for the DISTANCE study was
provided by grants R01 DK65664, DK081796, DK080726
from the National Institute of Diabetes and Digestive and
Kidney Diseases (NIDDK) and grant R01 HD046113 from
the National Institute of Child Health and Human De-
velopment. Dr Ratanawongsa’s mentorship by Drs Schil-
linger and Karter is supported by grant P30DK092924 from
the NIDDK for The Health Delivery Systems–
Center for Diabetes Translational Research.

Role of the Sponsors: The funders had no role in the de-
sign and conduct of the study; collection, management,
analysis, and interpretation of the data; or preparation,
review, or approval of the manuscript.

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On the Road to Patient Centeredness

With the publication of Crossing the Quality Chasm: A New Health System for the 21st Century, the Institute of Medicine (IOM) enshrined patient centeredness as 1 of 6 distinct dimensions of health care quality.1 In the subsequent decade, patient centeredness gained acceptance as a quality dimension among patients and health care providers, but broad agreement on how to measure patient centeredness and its impact on health outcomes has lagged.2 If you ask most health system administrators to define patient centeredness, they would likely invoke John Kotter by answering “I can’t define patient centeredness, but I know it when I see it.” As a result, hospitals routinely advertise a “patient-centered approach” to care without actually communicating specific attributes that confirm their patient centeredness or demonstrate how patient centeredness leads to better patient experiences or outcomes.3

REDESIGNING A PATIENT-CENTERED HEALTH SYSTEM

The IOM defines patient centeredness as “providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.”4 The new vision statement by the Patient-Centered Outcomes Research Institute confirms this definition. Achieving patient centeredness will require health system redesign, likely through iterative processes occurring in 2 distinct phases. In the first phase, the dynamics of patient-physician communication and decision making shift to focus on patient-defined outcomes with scientific evidence and professional judgment informing treatment options and processes.5 In fee-for-service medicine, evidence and professional standards define outcomes with patient preferences informing the processes of care.1 Patient-centered communication, defined as a free flow between patients and clinicians about values and goals as well as data and experiences relevant to a clinical decision, facilitates collaborative treatment plans that are personalized to achieve patient-oriented outcomes.5 The patient-centered medical home (PCMH) model, supported by a broad coalition of health care providers and stakeholders, is a coherent example of how the first phase of patient centeredness may function. The second phase of patient centeredness is more controversial because it gives patients and their families some accountability for determining quality and use of health care.6 The IOM principles for system redesign that best define this second phase are the “need for transparency” and the “patient as the source of control.”7 As of today, information defining quality either does not exist or cannot be understood universally. Many patients, clinicians, hospitals, and insurers are, therefore, reluctant about this phase of patient centeredness.

MODELS OF PATIENT-CENTERED COMMUNICATION AND DECISION MAKING

In this issue, the findings by Ratanawongs et al8 advance our understanding of patient-centered communication and decision making (ie, first phase of patient-centered redesign) and how patient centeredness relates to outcomes like medication adherence. Patients reporting low ratings of patient-centered communication and trust with their personal clinician had 7% to 16% worse nonadherence rates to medication refills compared with patients reporting high ratings after adjusting for clinical and sociodemographic characteristics.8 The study has a number of methodological strengths that further its relevance and importance. First, the investigators measure adherence using objective pharmacy utilization data for medication refills across a number of medication classes rather than patient self-report.