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# Evaluating Group Visits in an Uninsured or Inadequately Insured Patient Population With Uncontrolled Type 2 Diabetes

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## PURPOSE

**T**his study was conducted to evaluate the feasibility and acceptability of a managed-care approach (group visits) on delivering care to uninsured or inadequately insured patients with type 2 diabetes.

## METHODS

One hundred twenty patients with uncontrolled type 2 diabetes were randomly assigned to receive care in group visits or usual care for 6 months. At baseline, 3 months, and 6 months, the feasibility and acceptability of this model of healthcare delivery were assessed through the patients' responses to the Primary Care Assessment Tool and the Trust in Physician Scale. Attendance records were kept for each group.

## RESULTS

Patients who received care in group visits showed an improved sense of trust in their physician compared with patients who continued to receive usual care. There was a tendency for patients in groups to report better coordination of their care, better community orientation, and more culturally competent care. Patient attendance at the groups also indicated good acceptance of this form of healthcare delivery.

## CONCLUSIONS

Group visits were feasible and acceptable to these uninsured and inadequately insured patients with uncontrolled type 2 diabetes and fostered an improved sense of trust in their physician.

Complications of diabetes, a chronic disease affecting close to 16 million people in the United States and costing almost \$100 billion annually, can be delayed or prevented by intensive glycemic control.<sup>1</sup> *Intensive control*, which is defined as reaching a median target hemoglobin A1C (A1C) of 7.0%, has been shown to decrease the incidence of retinopathy, nephropathy, and possibly neuropathy by as much as 25% compared with a median A1C of 7.9%. According to the findings from the United Kingdom Prospective Diabetes Study (UKPDS), 90% of patients with type 2 diabetes can reduce their risk for serious complications by 35% with every percentage point decrease in A1C.<sup>2</sup>

The current American Diabetes Association (ADA) standards of care for patients with diabetes states that patients with poorly controlled diabetes should have A1C levels monitored quarterly.<sup>3</sup> Recommendations for all patients with diabetes are to have annual retinal and foot exams, annual influenza vaccinations, and pneumococcal immunizations, and monitoring of blood pressure, urine microalbumin levels, and lipid profiles, with treatment as indicated.<sup>3</sup> Lack of access to appropriate healthcare services places uninsured and inadequately insured persons at particular risk for complications of type 2 diabetes because they are unable to obtain care at the level of intensity presently recommended. Because they rely heavily on public assistance for medical care, their health care usually comes later in the course of the disease and at a greater cost due to premature complications.

During this time of more tightly controlled resources, all healthcare organizations are challenged to deliver efficient and effective care to their patients with type 2 diabetes consistent with the ADA standards of care.<sup>3</sup> The group visit model, developed in managed-care settings to address issues of treatment effectiveness and efficiency, offers promise. Previous studies have shown group visits to be at least as effective as usual care but less costly. Beck and colleagues<sup>4</sup> developed and implemented a group visit intervention for geriatric patients with a history of high utilization of health services. A physician and nurse conducted these groups, which involved a monthly 2-hour session for 1 year (12 sessions).<sup>4</sup> Although there were no significant improvements in self-reported health and functional status for the intervention group, there were significant decreases

in emergency care visits, specialty care visits, and hospital readmissions, with higher administration rates of influenza and pneumonia vaccination, completion of advance directives, and improved satisfaction with care.

Trento and colleagues<sup>5</sup> demonstrated that providing health care to groups of patients with type 2 diabetes resulted in improved metabolic control compared with usual care. Patients who received care in a group setting showed significantly increased knowledge of type 2 diabetes and improved quality of life. Except for race, the patients who participated in this Italian study had similar employment, education, and insurance status to the patients in the study reported here.

Another study targeting patients with type 2 diabetes ages 16 to 75 years with either a recent A1C level >8.5% or no A1C in the previous year evaluated a slightly different model of group visits.<sup>6</sup> In this model, a team led by a diabetes nurse educator, with input from a dietitian, behaviorist, and pharmacist, and supported by 2 diabetologists, conducted monthly 2-hour group visits in 6-month cycles focused on diabetes. Patients continued to receive their routine care from their primary care providers in the managed-care organization. The physician coinvestigators met periodically with the diabetes nurse educator to review the patients' progress, and a physician was readily available to the group if needed. However, the physicians were not active participants in these group visit sessions. The investigators reported improvement in diabetes control, self-efficacy, and patient satisfaction, with decreases in health services use. However, an intent-to-treat analysis was not used except for the health services use analyses.

Although the group visit model of healthcare delivery has proven effective in managed-care patient populations, there have been no studies to date in uninsured and inadequately insured patient populations. The purpose of this study was to evaluate whether group visits would be acceptable and/or feasible in uninsured or inadequately insured patients with uncontrolled type 2 diabetes.

#### OBJECTIVES AND OUTCOMES

In this study it was hypothesized that delivering care in a group setting would prove feasible and acceptable for uninsured and inadequately insured patients with uncontrolled type 2 diabetes without negatively affecting their

trust in their physician. The following patient outcomes were monitored: perception of characteristics and quality of care as measured by responses to the Primary Care Assessment Tool (PCAT)<sup>6</sup> (Figure 1). This well-validated tool developed by Shi and colleagues<sup>6</sup> is used to evaluate patient satisfaction in underserved populations, trust in healthcare provider as measured by responses to the Trust in Physician Scale (TPS)<sup>7</sup> (Figure 2), and patients' attendance to group visits.

## RESEARCH DESIGN AND METHODS

### Study Population

This study took place at the Adult Primary Care Center (APCC) at the Medical University of South Carolina, a clinic that serves approximately 6000 uninsured or inadequately insured patients in the Charleston, South Carolina area. Most (62%) of the population is African American, 36% live outside an area accessible by public transportation, and many are residents of the surrounding rural areas. Approximately 65% of the patients are female. Diabetes is the second most common diagnosis for which patients at the APCC are seen, followed by hypertension. Four full-time academic internal medicine faculty physicians who supervise residents, nurse practitioners, physician assistants, and students serve this patient population.

eligible patients were identified from a pool of over 2000 patients through a query of the electronic medical records system used at the APCC. Inclusion criteria were age  $\geq 18$  years with a diagnosis of type 2 diabetes and most recent A1C level  $> 8.5\%$ . Exclusion criteria were a primary diagnosis of substance abuse or dependence, current pregnancy, dementia, or inability to communicate in English. Identified patients were invited to participate through telephone or on-site solicitation using a standardized script that was presented to the patients by 1 of 3 interviewers (DEC, AWF). For both intervention and control patients, a modest reimbursement was provided when they came in for data collection at baseline, 3 months, and 6 months as compensation for their time and transportation. These data collection visits were separate from any patient healthcare visits.

### Randomization and Blinding

Patients who provided written informed consent were randomly assigned to the intervention group (group visits) or the control group (usual care). A program developed by the University of Texas System Cancer Center (Randlst), which allows for stratification and blocking, was used for randomization (available at <http://odin.mdacc.tmc.edu/anonftp/>). Block randomization was used with a block size of 4 to assure a balance in the number of patients randomized to the 2 interventions. Patients were notified of their group assignment in sealed envelopes that were distributed after they had given written consent and baseline data were collected. After opening the envelopes, the patients informed the study administrator of their group assignment and this information was recorded in a log book. The intervention patients then scheduled their group visits based on what was most convenient for them. Clinic personnel were blinded to the patients' assignments throughout the study unless the patients volunteered that information at visits other than group visits.

### Procedure

All patients enrolled in the study received reminder cards for their appointments, which is the usual procedure for the APCC. They also received letters and phone calls as reminders to schedule the data collection appointments. At baseline and within a 2-week period at 3 months and 6 months postrandomization, the intervention and control groups completed 2 surveys, the Trust in Physician Scale<sup>7</sup> and the Patient Care Assessment Tool,<sup>6</sup> both of which were scored on a 5-point Likert scale. The PCAT is a well-validated tool for evaluating patient satisfaction in underserved populations.<sup>5</sup> The authors of this tool assisted in adapting the PCAT for the Agency for Health Research and Quality EXCEED project at the Medical University of South Carolina to measure attributes of primary care, including first contact care, longitudinal or ongoing care, comprehensive care, coordinated care, community-oriented care, culturally competent care, and family-centered care. Study participants were given modest reimbursement for transportation to the clinic to complete the surveys. Patient attendance was recorded for both groups at each visit.

Figure 1.

<b>PATIENT CARE ASSESSMENT TOOL</b>					
	<b>Definitely</b>	<b>Probably</b>	<b>Probably Not</b>	<b>Definitely Not</b>	<b>Not Sure/Don't Remember</b>
<b>First Contact - Utilization</b>					
6. I go to my PCP before going somewhere else					
a. when I need a regular checkup.	4	3	2	1	9
b. when I have a new health problem.	4	3	2	1	9
c. when I have to see a specialist.	4	3	2	1	9
7. Do you have to wait a long time or talk to too many people to make an appointment at your PCP?	4	3	2	1	9
8. When your PCP is open and you get sick, would someone from there see you the same day?	4	3	2	1	9
9. When the office is open, can you get advice quickly over the phone if you need it?	4	3	2	1	9
10. When the office is closed, is there a phone number you can call when you get sick?	4	3	2	1	9
Check <b>one</b> best answer.					
<b>Ongoing Care</b>					
11. When you go to see your PCP, do you see the same doctor or nurse each time?	4	3	2	1	9
12. Does your PCP know you very well as a person rather than as someone with a medical problem?	4	3	2	1	9
13. Does your PCP give you enough time to talk about your worries or problems?	4	3	2	1	9
14. Are your questions to your PCP answered in ways that you understand?	4	3	2	1	9
If you ever had a visit to any kind of specialist or special service please answer Q.15-18 about the last visit you made to the specialist or special services. If not, skip to Q.19.					
Check <b>one</b> best answer.					
<b>Coordination</b>					
15. Did your PCP suggest you go to the specialist or special service?	4	3	2	1	9
16. Did your PCP help you make the appointment for that visit?	4	3	2	1	9
17. Does your PCP know what the results of the visit were?	4	3	2	1	9

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Figure 1.

<b>PATIENT CARE ASSESSMENT TOOL (CONTINUED)</b>					
	<b>Definitely</b>	<b>Probably</b>	<b>Probably Not</b>	<b>Definitely Not</b>	<b>Not Sure/ Don't Remember</b>
18. After going to the specialist or special service, did your PCP talk with you about what happened at the visit? Check <b>one</b> best answer.	4	3	2	1	9
<b>Comprehensiveness (Service Needed)</b>					
Following is a list of services that you or your family might need at some time. For each one, please indicate whether it is available at your PCP's office.					
19. Family planning or birth control methods	4	3	2	1	9
20. Counseling for mental health problems	4	3	2	1	9
21. Sewing up a cut that needs stitches	4	3	2	1	9
22. PAP tests for cervical cancer	4	3	2	1	9
Check <b>one</b> best answer.					
<b>Comprehensiveness (Service Received)</b>					
In visits to your PCP are any of the following things discussed with you?					
23. Advice about healthy and unhealthy foods	4	3	2	1	9
24. Ways to handle family conflicts that may arise from time to time	4	3	2	1	9
25. Advice about appropriate exercise for you	4	3	2	1	9
26. Checking on and discussing the medications you are taking	4	3	2	1	9
Check <b>one</b> best answer.					
<b>Family Centeredness</b>					
27. Does your PCP ask about your ideas and opinions when planning treatment and care for you or a family member?	4	3	2	1	9
28. Has your PCP asked about illness or problems that might run in your family?	4	3	2	1	9
29. Will your PCP ask to meet with your family members if you thought it would be helpful?	4	3	2	1	9
Check <b>one</b> best answer.					
<b>Community Orientation</b>					
30. Does anyone in your PCP's office ever make home visits?	4	3	2	1	9
31. Does your PCP know about the important health problems of your neighborhood?	4	3	2	1	9

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Figure 1.

<b>PATIENT CARE ASSESSMENT TOOL (CONTINUED)</b>					
	<b>Definitely</b>	<b>Probably</b>	<b>Probably Not</b>	<b>Definitely Not</b>	<b>Not Sure/ Don't Remember</b>
32. Does your PCP get opinions and ideas from people that will help to provide better health care? Check <b>one</b> best answer.	4	3	2	1	9
<b>Culturally Competent</b>					
33. Would you recommend your PCP to a friend or a relative?	4	3	2	1	9
34. Would you recommend your PCP to someone who does not speak English well?	4	3	2	1	9
35. Would you recommend your PCP to someone who uses folk medicine, such as herbs or homemade medications, or has special beliefs about health care? Check <b>one</b> best answer.	4	3	2	1	9

PCP=primary care practitioner.  
Reprinted with permission from Shi L.<sup>6</sup> Developed at the Johns Hopkins Primary Care Policy Center, Baltimore, Maryland.

However, due to limitations of the administrative databases at the APCC, the individual attendance rates for the patients randomized to the control condition were not available; only the global attendance rate for the clinic was available.

#### Intervention Group

Group visits were led by both a primary care internal medicine physician and a diabetes nurse educator. These visits were modeled after the group approach to individual care at the Cooperative Health Care Clinics (CHCC).<sup>6</sup> Prior to starting the study and after having reviewed the pertinent literature and the orientation manual for the CHCC, the physician and nurse leaders were trained at the CHCC in Denver, Colorado. There they met with the Coordinator for the CHCC who trains all CHCC providers, and they observed several group visits in session. This training mirrored what the CHCC providers receive.

After completing the provider training and acquiring the patients' baseline data, the patients randomized to the intervention condition were scheduled into 3 groups consisting of 19 or 20 patients each; these groups met monthly for 6 months. The visits were held in the same building but on a different floor from the clinic and were intended to be the main source of

medical care. If patients needed care between scheduled group visits, or if specific medical needs could not be accommodated in the group visit, they could schedule a one-on-one visit with an APCC provider in the clinic. Each group visit session lasted 2 hours and consisted of 15 minutes for warm-up and socialization, 30 minutes for presentation of a health-related topic (facilitated by the physician or another team member with special expertise), 15 minutes for a break (the nurse and physician circulated during this time, attending to individual needs, immunizations, appointment scheduling, and other issues), 15 minutes for questions and answers, 15 minutes for planning the next session, and 30 minutes for one-on-one consultations with the physician (Table 1). Key preventive measures, (eg, pneumonia and influenza vaccinations and foot exams) were performed on site during the group visits. Content of the group visits was guided by the group members, although the educational topics covered the core curriculum topics used by Sadur et al<sup>8</sup> (Table 2). After the group portion of the visit was completed, patients had the opportunity to see the physician individually.

#### Control Group

Patients randomized to the control condition continued to receive their usual care at the clinic. Usual care at the APCC consists of seeing a faculty or resident physician, physician

**Figure 2.**

<b>TRUST IN PHYSICIAN SCALE</b>	
My healthcare provider	
1.	Does not really care about me as a person.
2.	Is usually considerate of my needs and puts them first.
3.	Is trustworthy so I always try to follow his/her advice.
4.	If my healthcare provider tells me something, then it must be true.
5.	I sometimes distrust my healthcare provider's opinion and would like to hear another opinion (second opinion).
6.	I trust my healthcare provider's judgements about my medical care.
7.	I trust my healthcare provider to put my medical problems first when treating my health problems.
8.	My healthcare provider is a real expert at taking care of medical problems.
9.	I trust my health care provider to tell me if a mistake was made by my treatment.
On a scale of 1 to 5 (1=poor to 5=excellent)	
10.	The care I receive from my healthcare provider is _____.

*Reprinted with permission from Anderson LA.<sup>7</sup>*

assistant, nurse practitioner, medical student, physician assistant student, or nurse practitioner student for medical care. Due to the volume of visits at the APCC, patients do not usually have the opportunity to see the same provider at each visit. The staff at the APCC attempts to follow the ADA standards of care for patients with type 2 diabetes<sup>2</sup> with quarterly visits and lab assessments of A1C levels. Referrals also are available for patients with type 2 diabetes to see a diabetes educator or a dietitian.

#### **Statistical Methods**

Initially, data obtained at baseline were evaluated for any significant differences between the treatment and control groups for each outcome. The longitudinal model of the outcomes was then studied. For each single outcome, a generalized linear model with correlated repeated measures was used to fit the data. No assumption was imposed on the correlation matrix among longitudinal repeated measures. The comparison between treatment and control was analyzed in 2 different ways to check for any group cluster effect: (1) with each group separate (taking the cluster into account) and (2) with all treatment groups combined. The change of each outcome, as measured by the slope, was

compared between the treatment group and the control group. The SAS Genmod procedure was used in model fitting (SAS Institute, Cary, NC).

O'Brien's global statistical test<sup>9</sup> was used to compare combined treatment effects in each domain of the outcomes. The results from the global statistical test provided information about the treatment effect by testing the overall effects from all of the combined outcomes in the domain. For each patient, the slope of each outcome in the domain was computed. The nonparametric global statistical test was then used to compare the slopes between the treatment and control groups.<sup>9</sup> In the computing the slope, any missing value at the baseline measure was imputed by the average observed value for that outcome at baseline. Any missing value in the follow-up visit was imputed by the previous visiting measure of the same patient.

#### **RESULTS**

During a 4-week period in May and June 2001, 242 patients were contacted by phone or on site to reach the enrollment goal of 120 patients. Using these procedures, 59 patients were randomly assigned to group visits (intervention group) and 61 patients to usual care (control group).



**Table 1.****Group Visit Appointment Schedule****2-Hour Schedule:**

Breakdown by Minutes	Activity
15	Warm-up and socialization, care given
30	Educational presentation
15	Break, care given
15	Questions and answers
15	Planning the next session
30	One-on-one consultations, care given

**Table 2.****Diabetes Cooperative Care Clinic Topics for Discussion<sup>8</sup>**

- Nutrition
- Interpreting blood glucose results—What do the numbers mean?
- Emotional aspects of diabetes
- Diabetes and sexuality
- Sick-day strategies/management
- What is A1C and why is it important?
- Foot care/special care of feet
- Exercise is not a four-letter word
- Physical screening guidelines/rationale
- Pharmacy talk/medications
- Traveling
- Alternative/new treatments
- Complications

The demographics of the patients are shown in Table 3. Baseline analyses showed that all variables were well balanced between the intervention and control groups. Ten patients in usual care and 7 patients in group visits withdrew from the study. One of the 7 patients who withdrew moved out of the area postrandomization but prior to the first group visit; this patient's data were not used in the final data analysis.

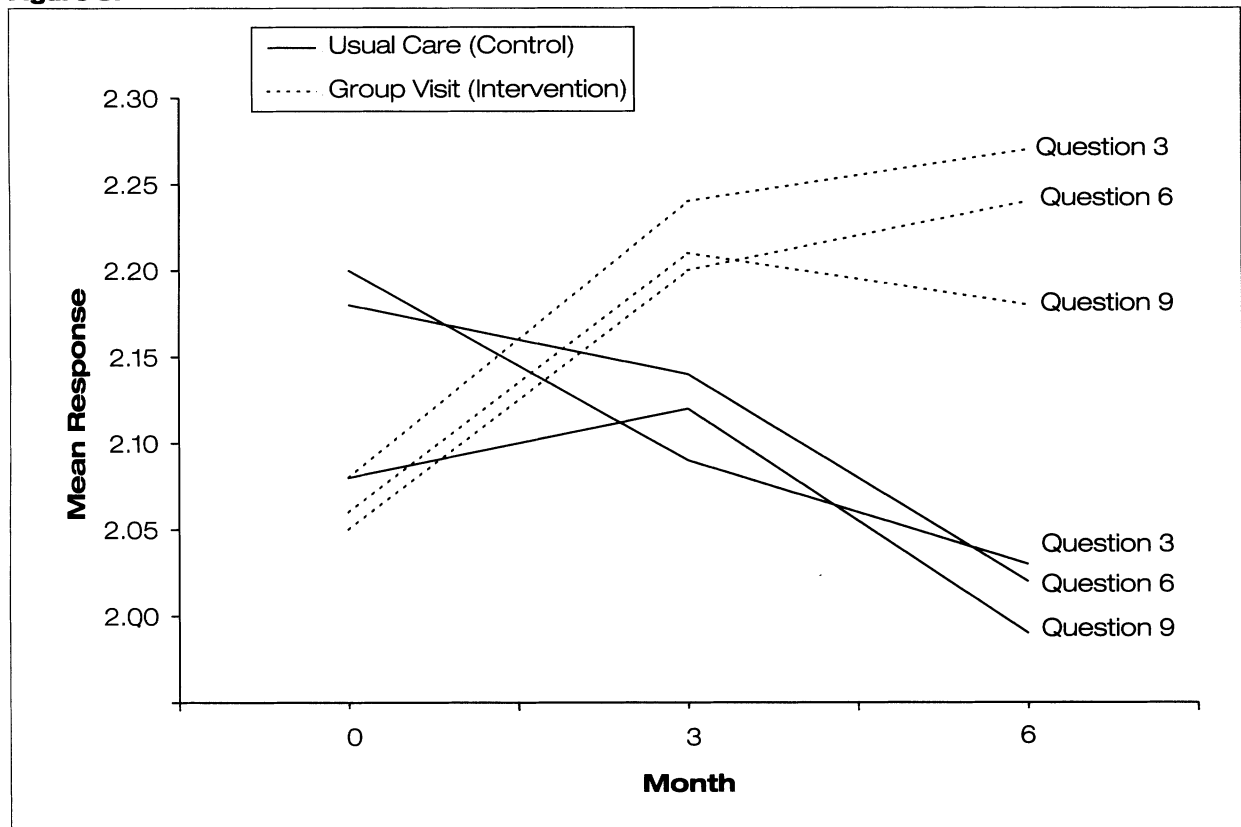
The average age was 54.0 years (range=22 to 83). As is typical of APCC patients, 78.3% were female, 77.5% were African American, and 34.2% reported being currently married. The mean of the self-reported educational levels for these patients was 10.6 years, but the average health literacy level, as assessed through the use of the Rapid Estimate of Adult Literacy (REALM) Tool,<sup>10</sup> was grade 7.5. Four patients (5.8%) had commercial insurance,

44.3% had Medicaid, 19.1% were on Medicare, and 30% had no insurance. Twenty-three percent of the patients reported working either full time or part time.

There were no significant differences between the intervention and control groups at the baseline visit among all outcomes due to randomization. A comparison of the slopes between the intervention and control groups demonstrated significant improvements in the intervention group over the control group in several outcomes. The analyses also revealed some group cluster effects. Some of the intervention groups had significant improvements over the control group, but other intervention groups had

**Table 3.****Demographics of Study Population (N=120)**

Characteristic	Mean (SD)	n (%)
Age, y	53.96 (10.44)	
Sex		
Male		26 (21.7)
Female		94 (78.3)
Race		
African American		93 (77.5)
Caucasian		26 (21.7)
Other		1 ( 0.8)
Marital status		
Single		45 (37.5)
Married		41 (34.2)
Divorced		11 ( 9 )
Separated		10 ( 8 )
Widowed		13 (10.8)
Education		
Years completed	10.6 ( 3.0 )	
Reading level	7.5 ( 3.7 )	
Insurance		
Commercial		7 ( 5.8)
Medicaid		33 (27.5)
Medicaid A&B		20 (16.7)
Medicare/Medicaid		22 (18.3)
Medicare alone		1 ( 0.8)
No insurance		36 (30 )
Work		
Full/part time		28 (23.3)
Retired/unemployed		92 (76.7)

**Figure 3.**

Mean responses for questions 3, 6, and 9.

nonsignificant improvement or even nonsignificantly worse results than the control group. Consequently, the combination of the intervention groups was not significantly different from the control group in the outcome. Examples of such outcomes include primary care assessment outcomes PCAT8, PCAT11, PCAT13, and PCAT17 (Figure 1), and trust in healthcare provider outcomes TPS7 and TPS8. Outcomes that showed statistically significant improvements in individual groups as well as the groups combined compared with the control group were primary care assessment outcomes PCAT14, PCAT23, and PCAT33, and trust in healthcare provider outcomes TPS3, TPS6, and TPS9 (Figure 3, Table 4).

The global statistical test for each domain of outcome slopes showed evidence of overall treatment benefit in several domains. These benefits were coordination (primary care assessment outcomes PCA15-PCA18,  $P=.076$ ), community orientation and cultural competence (PCA30-PCA35,  $P=.096$ ), and the entire trust in physician scale (TPS1-TPS10,  $P=.02$ ). No significant differences were found among any other outcomes. Group visit attendance (Table 5) varied by group, ranging from a low of 59% for Group 1 to 82% for Group 3.

## DISCUSSION

The initial concern that patients in group visits would feel less trust in their physician than patients in usual care was dispelled. The data show that trust levels actually increased for group visit patients. There may be several reasons for the improvement in trust in physician scale. First, there may be some aspect of the group visit that was helpful in improving trust. Specifically, key factors may have been the increased amount of one-on-one time with providers (2 hours/month compared with 20-30 minutes every 3 months) and the opportunity that was afforded by improved interactions, more questions, and clarification of unclear self-management procedures. Second, in the APCC, a clinic that serves uninsured and inadequately insured patients, there has historically been a lack of continuity available to the patients. The continuity that was afforded to the patients by group visits, with the same physician and same diabetes nurse educator leading each group, may have been responsible for this sense of increased trust. Additionally, attributes of the particular individuals who were the providers for the groups may have been the reason for greater trust.

**Table 4.***Results for Trust in Physician Scale*

Question	Control Group			Intervention Group		
	Baseline	3 Months	6 Months	Baseline	3 Months	6 Months
1	1.08	0.93	0.83	0.88	0.91	0.88
2	2.15	2.09	2.02	1.95	2.20	2.26
3	2.18	2.14	2.02	2.08	2.24	2.27
4	2.07	1.98	1.94	1.89	2.04	2.11
5	1.44	1.34	1.21	1.20	1.11	1.15
6	2.20	2.09	2.03	2.05	2.20	2.24
7	2.18	2.20	2.05	2.08	2.23	2.27
8	2.10	2.06	2.00	2.01	2.17	2.18
9	2.08	2.12	1.99	2.06	2.21	2.18
10	2.30	2.30	2.24	2.25	2.35	2.37

Global statistical test  $P=.02$ .

Though the patients' perceptions of their care can only be described as showing a trend in favor of the group patients for coordination of care, community orientation, and cultural competence, these trends may provide some insight into why the trust levels were higher. If patients perceive their care as more coordinated, more integrated into the community, and culturally competent, it stands to reason that trust in the provider who is delivering that care would improve.

Group visits were found to be acceptable to the intervention patients as is evidenced by their attendance rates remaining at least as good as those of the general clinic population. Although it was not possible to document the attendance rates of the control patients, the general clinic population attendance rate has been stable over the last 8 years at 60% to 70%, which essentially mirrored the attendance rates of the patients who attended group visits. The fact that attendance remained good when the patients were charged the customary visit deposit fee of \$20 for 3 of the 6 visits further supports the conclusion that the group visits were acceptable to the participating patients. In addition, more patients in the usual care condition withdrew from the study than in the intervention condition, implying that the intervention patients were at least as

**Table 5.***Attendance Rate*

Group Number	Attendance, %
Group 1*	59
Group 2*	65
Group 3	82
Overall	69

\*Did not receive reminder cards for 1 session.

satisfied with the group visits as the patients in the general clinic population. This model was also found to be feasible from an operational standpoint. Although we have not completed an economic analysis, we anticipate at least a modest improvement in efficiency.

In conclusion, this pilot study demonstrates that group visits are feasible and acceptable to uninsured and inadequately insured patients with type 2 diabetes. Improved trust in the healthcare provider also was demonstrated in this patient population. Yet to be determined, however, is the response of a larger patient population to this model, as well as the economic feasibility of the model, which was not assessed in this study.

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