

The Effect of Exit-Interview Patient Education on No-Show Rates at a Family Practice Residency Clinic

Clare E. Guse, MS, Leanne Richardson, MD, Mariann Carle, MD, and Karin Schmidt, MSW

Background: Residency clinics with high no-show rates experience negative ramifications in patient health care, continuity, clinic productivity, and learning experiences for residents. This study tested patient education in the form of an exit interview to reduce no-show rates.

Methods: All eligible new patients at St. Mary's Family Practice Center between 1 February 1996 and 30 April 1997 were offered study enrollment. Patients with initial appointments during 5 of 9 clinic sessions were offered an exit interview with visit debriefing, written patient information where appropriate, and review of clinic policies. Missed patients or those with initial appointments during the remaining 4 sessions formed the control group. Interviewers were social work, medical, and nursing students. Insurance and subsequent appointment data were obtained from billing records. Median household income of ZIP codes in which patients resided was obtained from the 1990 Federal Census data. Data were analyzed using χ^2 tests, Wilcoxon rank-sum tests, and logistic regression.

Results: One hundred forty-six patients were enrolled into the intervention and 297 into the control group. Simple logistic regression showed a significant reduction in the risk of no-shows in the intervention group (odds ratio = 0.71, $P = .04$).

Conclusions: The exit interview improved attendance at subsequent visits. (J Am Board Fam Pract 2003;16:399–404.)

The effects of missed medical clinic appointments on patient health have not been studied extensively, and published studies are not comparable or definitive. It is reasonable to think that patients who miss appointments will also miss some opportunities for timely health care interventions. Andrews and colleagues¹ concluded that 21 of 34 children in Great Britain whose parents did not bring them to follow-up appointments needed further medical attention and were therefore at risk for "avoidable ill health." Bigby's group,² however, found no significant differences in development of new medical problems, exacerbation of old medical problems, or hospitalizations or death between 100 no-show and 100 control adult patients in a primary care center in Boston. This 1984 study also raised the question

of whether follow-up appointments were being offered unnecessarily in some cases. Cummings group's study³ of 973 adults with hypertension used reminder cards and telephone calls to improve compliance with appointments and treatment in the study group, who also showed some improvements (not statistically significant) in blood pressure control over the control group.

However, although the medical importance of keeping clinic appointments remains to be elucidated, reducing no-show rates is important for other reasons. Missed appointments adversely affect clinic productivity.^{4,5} At our institution and other residency training clinics, no-show rates are believed to significantly reduce resident learning opportunities. Weingarten and colleagues⁶ found a significant difference in missed appointment rates by training level of the physician, with medical students and first-year residents having the highest rate of missed appointments.

Keeping appointments for medical services has been evaluated in a variety of different settings, from outpatient mental health facilities to primary care clinics. Attempts have been made to identify

Submitted, revised, 18 December 2002.

From the Department of Family and Community Medicine, Medical College of Wisconsin, Milwaukee (CEG, KS), New West Physicians, Brownfield, Colorado (LR), the Department of Family Medicine, University of Washington School of Medicine, Seattle (MC), and St. Mary's Family Practice Clinic, Milwaukee, Wisconsin (KS). Address correspondence to Clare E. Guse, MS, Department of Family & Community Medicine, Medical College of Wisconsin, 8701 Watertown Plank Rd., Milwaukee, WI 53226-0509.

common patient factors associated with failure to keep appointments⁷⁻¹⁶ or to elicit reasons for missing appointments.^{1,2,5,11,17-19} Although individual studies have found a correlation between appointment keeping and certain characteristics such as age, race, insurance status, and time of day, other studies show no correlation. It is likely that the reasons patients fail to keep appointments are multiple and complex¹ and that attempts to characterize such patients will serve no useful purpose.

Many studies have been geared toward interventions that may decrease no-show rates. Letters, postcards, telephone calls, pamphlets, orientation videos, monetary incentives, and patient education have all been evaluated in a variety of settings.^{3,19-26} Although many of these methods have been shown to be useful in decreasing no-show rates, interventions clearly need to be tailored to the population of interest. For example, telephone calls would be ineffective in a population with no or intermittent telephone service, and letters or postcards may not be helpful for a population with a low literacy level or frequent changes of address.

St. Mary's Family Practice Center in Milwaukee, Wisconsin, serves a population composed largely of low income and ethnic minority inner-city residents and averages a no-show rate between 22% and 25%. Prior attempts to decrease no-show rates with phone calls the day before the patient's appointment and phone calls to patients by their physicians after a missed appointment failed to make an impact. A clinic policy discharging patients from the clinic after 3 no-shows in a year also failed to appreciably affect the kept appointment rate.

According to Barron,¹⁸ "...a breakdown of communications is at the heart of higher failure rates often described in low income and ethnic minority patients." Hertz and Stamps²⁷ attributed a rise in broken appointments to a breakdown in communication on the part of the health center under study. Several studies have looked at the effect of face-to-face patient education in reducing the no-show rate,^{28,29} but face-to-face patient interventions aimed specifically at addressing the no-show problem in a general patient population have not been studied.

We undertook this prospective study to determine whether a one-time, face-to-face patient interview intervention (visit debriefing, review of clinic procedures, and written health information

where appropriate) during the first clinic visit decreases no-show rates in new patients at an inner-city family practice residency clinic.

Methods

The study design was a prospective cohort study, with enrollment between 1 February 1996 and 30 April 1997. Although intervention and control patients were not assigned in a strictly random fashion, the intervention was offered to new patients at 5 of the 9 St. Mary's Family Practice Center clinic sessions during the week, depending on student interviewer schedules, with control patients being drawn from the remaining 4 sessions. Patients were excluded from the study if they were mentally impaired, had a language barrier, or were enrolled in an immunization study running concurrently. Pregnant patients were also excluded because there was already a special emphasis on reinforcing the reasons for and importance of keeping prenatal appointments. Patients declining the interview or missed because the student providing the exit interview was engaged with another patient were excluded. When the patient was a child, the responsible adult received the intervention. We have assumed that this was how the intervention was delivered for all patients under the age of 18 years.

Intervention patients were seen by a social work, medical, or nursing student for an exit interview lasting approximately 10 minutes immediately after their initial visit (Table 1). Students were informed about the entire study process, the rationale for the patient education, and the methods they were expected to use in a 45-minute formal training session at the beginning of each semester. Students were encouraged to keep interviews conversational and interactive and were trained to optimize interview uniformity: training included a role-playing session. Control patients received the standard clinic information pamphlet when they registered at the front desk with no standardized explanation or discussion of clinic policy. The pamphlet describes the clinic and services provided, what to expect at the first visit, scheduling and rescheduling appointments, what to do in an emergency, confidentiality, and billing.

Date of visit, patient age, sex, race, education level, ZIP code, and provider name were collected at the time of the visit for patients in the intervention group. Except for education level, the same

Table 1. Exit Interview Content and Procedure

Exit interviews consisted of the interviewer:

1. Asking the patient if all their questions and concerns were addressed, if they understood the information received from their primary provider, and whether they agreed with the course of treatment.
2. Giving the patient written information regarding topics discussed, when appropriate.
3. Offering information and education on the following topics as outlined in the Patient Education Fact Sheet:
 - Triage/urgent Care
 - Transportation
 - No-show and lateness policies
 - Patient empowerment
 - Residency Program
 - Immunizations (when appropriate)
4. Responding to any further concerns the patient had.

Students were supervised by Family Practice Center faculty or social workers. A formal training session was held at the beginning of each semester for students to optimize uniformity. Students were encouraged to keep the interview conversational and interactive and to have the patients repeat the no-show policy in their own words. The above interview content took about 10 minutes, longer if the patient had more questions, and interviews were most often held in the examination room. If the examination room was needed for another patient, the student escorted the patient to the patient education room and conducted the interview there.

information was collected on the control patients. Information on insurance payor and subsequent appointments was obtained from billing records for the period 1 February 1996 through 23 April 1998. Median household income of patient residential areas by ZIP codes was obtained from the 1990 Federal Census data (<http://venus.census.gov/cdrom/lookup/>).

The only appointment events analyzed were arrivals and no shows. Cancelled appointments were not considered to be missed appointments. In some instances, patients were scheduled for multiple visits to different providers on the same day (eg, physician and nurse visits). Multiple events for a given patient on the same day were reduced to a single event in the following manner: (1) if all events were arrivals, then all but 1 arrival was dropped; (2) if all events were no-shows, then all but 1 no-show was dropped; and (3) if there was a mix of arrivals and no-shows, then 1 arrival was kept. This adjustment to the data was done to account for the relationship between attendance or nonattendance for a second or third visit on a given day and the attendance or nonattendance at an earlier visit on that same day. χ^2 tests and Wilcoxon rank-sum tests were used for univariate tests. The odds ratio (OR) of a no-show are reported. Logistic regression was used to simultaneously examine several risk factors for no-shows. Variables considered as possible confounders or effect modifiers included age <18 years, commercial insurance, race, residence in a low median income ZIP code, and interaction terms with age. A

survey technique was used to control for the reduced intrasubject variability (ie, the tendency of a patient to exhibit the same appointment-keeping behavior over time). All analyses were done using the Stata statistical package.³⁰

Results

Four hundred forty-three patients were enrolled in the study (297 to the control group and 146 to the intervention group). Twenty-three intervention and 9 control group subjects were excluded because they were related family members. Of the remaining 411 patients, 345 subsequently generated 2482 arrival (1985) or no-show (497) events. Sixty-six patients (50 control, 16 intervention) had no visits scheduled after their index visit and were excluded from subsequent analyses because a “no-show” rate could not be computed for them. Although these patients are not shown in Table 2, they were significantly older (mean 25.1 years vs 19.4, $P = .01$; Wilcoxon rank-sum test) and a higher percentage were white (48% vs 33%, $P = .02$; χ^2 test) compared with the patients with follow-up visits. Table 2 shows the demographics for the remaining patients in each study group. Patient age was significantly older in the control group. Forty-one percent of subjects designated their race as African American, 10% as Hispanic, and 33% as white. Fifty-five percent (67) of the intervention group and 44% (99) of the control group were under the age of 18 years.

Table 2. Characteristics of Intervention and Control Groups

Characteristic	Exit Interview Intervention (n = 121)	Control (n = 224)	P Value
Age, mean (range)	16.0 (2 days–69 years)	21.2 (3 days–88 years)	.01
Length of follow-up, mean (range) (days)*	311.8 (7–793)	347.8 (7–783)	.18
Male (%)	40	41	.86
African American (%) [†]	45	39	.04
White (%) [†]	35	33	.04
Hispanic (%) [†]	12	9	.04
Commercial insurance (%)	29	34	.30
Residential ZIP code median income below \$20,000 (%) [‡]	45	43	.75

Age and follow-up were tested with Wilcoxon rank-sum test.

* Last visit date minus index visit date.

[†] P value derived from χ^2 test of African American, white, Hispanic, and other/unknown by group.

[‡] Based on median income within ZIP code areas from the 1990 US Census.

The overall no-show rate was 20% of 2482 scheduled visits. The intervention significantly reduced the odds of a no-show by 29% [OR = 0.71; 95% confidence interval (CI), 0.51, 0.99; $P = .04$; logistic regression with adjustment for within-subject variability]. In absolute terms, the intervention reduced the rate of no-show by 5.2%, from 21.7% in the control group to 16.5% in the intervention group.

It was expected that the effect of the intervention would decay over time. However, no particular pattern was found in the relative risks by visit number. Multivariate logistic regression analysis of all postindex visits showed that receiving the exit interview, being under age 18, and having commercial insurance all significantly reduced the number of no-shows (Table 3). Residing in a ZIP code area in which the median income was below \$20,000 significantly increased the risk of no-show.

When the patient was a child, the intervention was received by the caregiver. Therefore, the effect of the intervention was further examined by introducing interaction terms between age <18 and each of the other 3 significant variables. Only the

age-income term was significant (OR = 0.56; CI, 0.32, 1.00). Table 4 shows the effect of income within age group. Residence in a low-income area was shown to have a larger effect on no-shows in the adults.

Discussion

We found a 29% overall reduction in the odds of a missed appointment in the group of patients receiving the immediate postvisit exit interview, corresponding to a 5.2% reduction in the no-show rate in absolute terms. Two previous studies have reported that personal attention in the form of patient education improves attendance at follow-up visits.^{28,29} These studies suggest that personal attention may be more important than educational content in improving attendance at follow-up visits. Although we cannot disentangle the effects of education and personal communication of clinic policies in our study, our results would tend to confirm the effectiveness of personal attention.

We did not see a degradation of the effect over time, as might be expected. It may be that patients

Table 3. Relationship of Factors with No-Show Outcome

Factor	Odd Ratios (95% Confidence Interval)	
	Unadjusted	Adjusted*
Exit Interview Intervention	0.71 (0.51, 0.99)	0.71 (0.51, 0.97)
Age <18 years	0.70 (0.53, 0.94)	0.60 (0.44, 0.82)
Commercial insurance	0.57 (0.42, 0.78)	0.49 (0.35, 0.68)
Residential ZIP code median income below \$20,000	1.48 (1.10, 1.98)	1.46 (1.09, 1.95)

* Adjusted for 3 other factors in the model and intrasubject variability.

Table 4. Effect of Low Income within Age Group

Age Group	Residential ZIP Code Median Income		95% CI for OR
	>\$20,000	<\$20,000	
<18 years	1.00*	1.13	(0.75, 1.71)
≥18 years	1.00*	2.00	(1.36, 2.94)

The analysis controls for the intervention, commercial insurance, age group, low income, and the interaction between age group and low income.

* Reference group.

who returned for follow-up visits had their behavior implicitly reinforced at those visits.

Having commercial insurance and higher income reduced no-show rates, as has been found in other studies.^{14,20} A number of studies have examined the relationship of age with no-show status; however, many of them do not include children. Although age was grouped somewhat differently, our study result for age showing a lower no-show rate in children under age 18 is similar to results found by Vikander and colleagues¹¹ and Weingarten and colleagues,⁶ who found slightly lower rates in ages 1 to 20 and 0 to 16 years, respectively.

A limitation of this study is that the exit interview intervention was not assigned completely randomly and the resulting control group was significantly older than the intervention group. Although age could be controlled for in multivariate analyses, there may have been other important and unmeasured factors that were out of balance between the groups. Likewise, the patients dropped from further study because they had no follow-up appointments were significantly older and more likely to be white. However, there was no significant difference between intervention and control groups in the percentage of patients without follow-up visits after the index visit. Therefore it seems unlikely that this group of patients would have affected our results.

Interviewer identifiers were not recorded and the precise number is unknown but was between 8 and 10. Although the student interviewers were trained so as to increase uniformity of interviewing technique, there may have been differences between interviewers in presentation of the information. This may have affected the patient's response to the information provided.

The number of patients excluded for the reasons given under Methods is unknown. However, the

study coordinator believed that exclusions because of language barrier or mental impairment were rare. The decision to exclude a patient because of mental impairment was made by the study coordinator in consultation with the student interviewer. Refusals by patients most often occurred when the patient's physician visit ran late and the patient was unable to stay for the exit interview because of personal time constraints. This was estimated to have occurred less than 20% of the time.

Another possible limitation is that some teenagers <18 years old may have received the intervention themselves, instead of in the company of a parent or guardian. However, an adult generally accompanies teenagers for initial visits. This is not expected to have an impact on our results because there were only 3 15-year-olds, no 16-year-olds, and 5 17-year-olds.

A possible confounding factor for this study was a concurrent effort to improve immunization rates in children. Although participants in an immunization study at the clinic were excluded from this study, there may have been some spillover effect.

Although we did not look at cost, financial consequences also impel research into effective interventions to reduce missed appointments. In a family medicine residency clinic with 45,000 annual patient visits, Moore et al⁴ found that the net loss of anticipated daily income from missed appointments that were not filled with walk-in and same-day appointments was 14.2%. Even full replacement of missed appointments would have been accompanied by a 3.3% revenue loss according to that study, because walk-ins generated lower charges. Presently, patient reminder/call systems, particularly telephone calls, seem to be the most cost-effective interventions in reducing no-show rates for immunizations.³¹ Future studies might include costs and benefits of the exit interview education approach alone or in conjunction with reminder systems for all appointment reasons.

Conclusion

In our study, the patient education exit interview improved attendance at subsequent visits. More studies with completely random assignment of interview intervention are needed. This one-on-one education for patients could potentially be a cost-effective way to help improve workflow, medical education, and continuity of care at teaching clinics.

References

1. Andrews R, Morgan JD, Addy DP, McNeish AS. Understanding non-attendance in outpatient paediatric clinics. *Arch Dis Child* 1990;65:192-5.
2. Bigby JA, Pappius E, Cook EF, Goldman L. Medical consequences of missed appointments. *Arch Intern Med* 1984;144:1163-6.
3. Cummings KM, Frisof KB, Demers P, Walsh D. An appointment reminder system's effect on reducing the number of hypertension patients who drop out from care. *Am J Prev Med* 1985;1:54-60.
4. Moore CG, Wilson-Witherspoon P, Probst JC. Time and money: effects of no-shows at a family practice residency clinic. *Fam Med* 2001;33:522-7.
5. Pesata V, Pallija G, Webb AA. A descriptive study of missed appointments: families' perceptions of barriers to care. *J Pediatr Health Care* 1999;13:178-82.
6. Weingarten N, Meyer DL, Schneid JA. Failed appointments in residency practices: who misses them and what providers are most affected? *J Am Board Fam Pract* 1997;10:407-11.
7. Alpert JJ. Broken appointments. *Pediatrics* 1964;34:127-32.
8. Taylor JM, Coffin LC, Irish EM. Missed appointments in Maine medical center's outpatient department. *J Maine Med Assoc* 1977;68:372-7.
9. Goldman L, Freidin R, Cook EF, Eigner J, Grich P. A multivariate approach to the prediction of no-show behavior in a primary care center. *Arch Intern Med* 1982;142:563-7.
10. Morse DL, Coulter MP, Napodano RJ, Hwang HL, Lawrence C. Broken appointments at a neighborhood health center. Emphasis on weather. *Med Care* 1984;22:813-7.
11. Vikander T, Parnicky K, Demers R, Frisof K, Demers P, Chase N. New-patient no-shows in an urban family practice center: analysis and intervention. *J Fam Pract* 1986;22:263-8.
12. Starkenburg RJ, Rosner F, Crowley K. Missed appointments among patients new to a general medicine clinic. *N Y State J Med* 1988;88:473-5.
13. Little B, Cannon C, Whitson B, Jarolim DR. The failed appointment. *J Okla State Med Assoc* 1991;84:455-8.
14. Smith CM, Yawn BP. Factors associated with appointment keeping in a family practice residency clinic. *J Fam Pract* 1994;38:25-9.
15. Majeroni BA, Cowan T, Osborne J, Graham RP. Missed appointments and Medicaid managed care. *Arch Fam Med* 1996;5:507-11.
16. Neal RD, Lawlor DA, Allgar V, et al. Missed appointments in general practice: retrospective data analysis from four practices. *Br J Gen Pract* 2001;51:830-2.
17. Ambuel JP, Cebulla J, Watt N, Crowne DP. Urgency as a factor in clinic attendance. *Am J Dis Child* 1964;108:394-8.
18. Barron WM. Failed appointments. Who misses them, why are they missed, and what can be done. *Prim Care* 1980;7:563-74.
19. Maxwell S, Maljanian R, Horowitz S, Pianka MA, Cabrera Y, Greene J. Effectiveness of reminder systems on appointment adherence rates. *J Health Care Poor Underserved* 2001;12:504-14.
20. Deyo RA, Inui TS. Dropouts and broken appointments: a literature review and agenda for future research. *Med Care* 1980;18:1146-57.
21. Kirking DM, Shue ME, Cohen IA, Hutchison TA. Reminder system for reducing missed appointments in an anticoagulation surveillance clinic. *Am J Hosp Pharm* 1985;42:2217-8.
22. Macharia WM, Leon G, Rowe BH, Stephenson BJ, Haynes RB. An overview of interventions to improve compliance with appointment keeping for medical services. *JAMA* 1992;267:1813-7.
23. Christensen AA, Lugo RA, Yamashiro DK. The effect of confirmation calls on appointment-keeping behavior of patients in a children's hospital dental clinic. *Pediatr Dent* 2001;23:495-8.
24. Hardy KJ, O'Brien SV, Furlong NJ. Information given to patients before appointments and its effect on non-attendance rate. *BMJ* 2001;323:1298-300.
25. Jain S, Chou CL. Use of an orientation clinic to reduce failed new patient appointments in primary care. *J Gen Intern Med* 2000;15:878-80.
26. Hashim MJ, Franks P, Fiscella K. Effectiveness of telephone reminders in improving rate of appointments kept at an outpatient clinic: a randomized controlled trial. *J Am Board Fam Pract* 2001;14:193-6.
27. Hertz P, Stamps PL. Appointment-keeping behavior re-evaluated. *Am J Public Health* 1977;67:1033-6.
28. Roberts BJ, Mico PR, Clark EW. An experimental study of two approaches to communication. *Am J Public Health* 1963;53:1361-81.
29. Glogow E. Effects of health education methods on appointment breaking. *Public Health Rep* 1970;85:441-50.
30. Stata statistical software: release 5.0 College Station, TX: Stata Corporation, 1997.
31. Szilagyi PG, Bordley C, Vann JC, et al. Effect of patient reminder/recall interventions on immunization rates: a review. *JAMA* 2000;284:1820-7.