

*AN APPOINTMENT-KEEPING IMPROVEMENT PACKAGE FOR
OUTPATIENT PEDIATRICS: SYSTEMATIC REPLICATION AND
COMPONENT ANALYSIS*

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Child health-care appointments that are not kept are an important pediatric problem. Previous research has shown that reducing effort (with a parking pass) and reminding patients (with mailed and telephone reminders) significantly improved appointment keeping for first-time and patient-scheduled appointments. This study, using a posttest-only group design, evaluated the effects of various combinations of that intervention applied to clinic-scheduled follow-up appointments. All combinations of the intervention significantly increased cancellations, but none increased appointments kept or decreased appointments not kept significantly. Log linear analyses showed that the lag time between scheduling and the appointment significantly influenced appointment keeping. The results suggest that if clinics want to increase cancellations, a mailed reminder and effort reduction are sufficient. To increase appointment keeping, other interventions, such as reduced lag time, may be necessary.

DESCRIPTORS: behavioral pediatrics, appointment keeping, adherence

Failure to keep medical appointments for children is a problem because health supervision, delivery of health services, and patient-provider continuity are reduced. Failure to notify health care providers before missing an appointment com-

pounds the problem because opportunities to communicate with the provider, reschedule an appointment for the child, and free the unused clinic time for other children are missed (Barron, 1980; Deyo & Inui, 1980; Frankel & Hovell, 1978; Hansen, 1953). A number of variables associated with missed appointments (defined as appointments neither kept nor canceled) have been identified, the most frequently mentioned of which involve effort (e.g., waiting time, distance, transportation, parking), communication (e.g., misunderstanding when the appointment was scheduled), and "forgetting" (Deyo & Inui, 1980; Friman, Finney, Rapoff, & Christophersen, 1985; Friman, Glasscock, Finney, & Christophersen, 1987; Hofmann & Rockart, 1969; Oppenheim, Bergman, & English, 1979).

Friman et al. (1985), in a study using interrupted time-series analysis, showed that decreasing effort (by facilitating easier parking with a mailed parking pass) and increasing communication (by mailing and telephoning appointment reminders)

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significantly improved appointment keeping by patients in a pediatric outpatient clinic. A follow-up study replicated the significant findings of the original study with additional patients (Friman *et al.*, 1987).

Other variables that affect appointment keeping are the source and sequence of the appointment. Appointments initiated by someone other than the patient (e.g., physician, nurse, or clerical staff) and follow-up appointments are at greater risk for being missed than patient-initiated or first appointments (Alpert, 1964; Andrews, Morgan, Addy, & McNeish, 1990; Barton, 1977; Gates & Colborn, 1976; Sackett & Snow, 1979). In fact, previous research has shown that appointment reminders, even when enhanced to improve their discriminative potency, do not improve appointment keeping for follow-up appointments (Rice & Lutzker, 1984). The Friman *et al.* (1985, 1987) studies targeted patient-initiated or first appointments. We attempted (a) to replicate the Friman *et al.* results with follow-up appointments scheduled by the clinic rather than by the patients, (b) to determine which combination of components in the intervention was the most effective, and (c) to examine another variable associated with appointment keeping—the lag time between scheduling and the appointment (cf. Benjamin-Bauman, Reiss, & Bailey, 1984).

METHOD

Setting and Subjects

The outpatient pediatric clinic at a midwestern medical center served as the setting for this study. The clinic was staffed by faculty physicians, resident physicians, fellows, pediatric nurse practitioners, and licensed practical nurses. Most of the general pediatric care was provided by four nurse practitioners and four staff physicians. The patients of this clinic represented all levels of socioeconomic status and resided primarily in the local metropolitan area. The patients came to the clinic for well-child health care and acute illnesses.

Parents of children who attended the general pediatric clinic and who needed to return within 2

months for continuing well-child care or follow-up care for acute illnesses were recruited for the appointment-keeping study during a 7-month period. During regular clinic hours when the investigator was present to recruit subjects, staff pediatricians and pediatric nurse practitioners identified patients who were asked to return to the clinic. Consent to participate in an appointment-keeping study was solicited, and current addresses and telephone numbers were obtained from the parents by the investigator. Those patients who reported having a telephone and who scheduled their appointments at the time of recruitment (or within 1 week) were randomly assigned in sets of four to one of four experimental or control groups: mail/telephone/pass (M/T/P), mail/pass (M/P), telephone only (T), and control (C). The distribution of the 293 study patients to experimental and control groups was as follows: M/T/P, 75; M/P, 73; T, 70; and C, 75.

There were no significant differences among the groups on demographic variables (i.e., age, sex, ethnic group, and socioeconomic status). There were no significant differences among groups in terms of type of provider (i.e., nurse practitioner or physician). The reasons for return visits were evenly distributed between well-child care and acute illness follow-up.

Data Collection

Appointments for individual patients were obtained from the clinic computer, which was used to monitor and generate clinic appointment sheets. The investigators kept a chronological list of all patients' appointments and compared the list to the daily clinic sheets for each provider. As patients arrived for their appointments, their names were checked off the list. If parents called to report that they would not attend their scheduled appointments, "CANCELED" was stamped over the name on the clinic sheet. At the end of each day, those names that had not been checked off or had not been marked "CANCELED" were stamped "DNKA" (did not keep appointment) by the clinic receptionists (who also were responsible for stamping the medical records with the same information).

The outcome of each patient's appointment was recorded on the investigator's chronological list and on each subject's individual data entry form, and was entered into a computer database file.

Dependent Measures

The outcome of each scheduled appointment served as the dependent measure. "Kept" indicated the patient arrived at the clinic at the scheduled time and was seen by the health care provider. "Not kept" indicated the patient did not arrive at the clinic at the scheduled time and was not seen (patients over 30 min late for a scheduled appointment were not seen and were considered "not kept"). "Canceled" indicated that the parents notified the clinic that they were unable to keep the appointment anytime before the scheduled time. Clinic personnel did not record the date or time that the parent canceled or whether the appointment was rescheduled.

The percentage of appointments kept was calculated for each experimental group by dividing the number of appointments kept by the total number of appointments per group. Canceled and not kept percentages were calculated for each experimental group in the same way.

Independent Measures and Experimental Groups

Mailed reminder. One week before each patient's scheduled return appointment, a reminder was mailed to the parent. The reminder listed the name of the child with the appointment and the time, day, and date of the appointment. Each reminder had the name, title, and signature of the provider. The M/T/P group and the M/P group received the mailed reminder.

Parking pass. A parking pass for the parking lot adjacent to the pediatric clinic was included with each patient's mailed reminder. This pass, which, when hung on the rearview mirror of the patient's car, allowed him or her to park in a lot adjacent to the clinic, was routinely available, free of charge, to all patients at the clinic. However, in order to obtain the pass, the patient had to enter the clinic, obtain the pass, and then return and place it on

the car. By mailing the pass, we reduced the effort necessary to park and thus to keep the appointment. The M/T/P and M/P groups received the parking pass with the mailed reminder.

Telephone reminder. At least 24 hr before each patient's appointment, a research assistant telephoned a reminder message that specified the name of the patient, the time, day, and date of the appointment, and the health care provider for the appointment. After three attempts to reach the parent at various times of the day and evening, the patient was recorded as not contacted by phone. To counterbalance effects due to gender and interpersonal style, several male and female research staff members delivered the telephone reminders. Parents who expressed problems with the time of their appointments were encouraged to call the clinic to make other arrangements. However, they were not recorded as canceled unless the parent notified clinic personnel before the time of the appointment. The M/T/P and the T groups received the telephone reminder.

Control group. Patients assigned to the control group received no reminder; this was the normal routine for the outpatient pediatric clinic.

Experimental Design

A posttest-only control group design with subjects randomly assigned to one of three intervention groups or a control group was used to evaluate the effects of the various combinations of the intervention. The between-groups design permitted a component analysis of the appointment-keeping reminder package used in the earlier time-series analysis studies by Friman et al. (1985, 1987) and a comparison with a no-treatment control group. Chi-square analyses of the data were performed to assess the statistical significance of the findings.

Reliability

Dependent measures. Reliability of the dependent measures was assessed in several ways. All results obtained from the daily clinic sheets, the investigator's chronological computer list, and the data entry form were compared. The daily clinic

sheet was considered the primary source. Only five errors out of 293 appointments (2%) were found.

Using a checklist, a comparison was made between the appointment result recorded on the patient's data entry form and the chart in the patient's medical record for the scheduled appointment date. Reliability scores were calculated by dividing the sum of agreements by the sum of agreements plus disagreements and multiplying by 100%. Chart reviews were conducted for 67 (23%) randomly selected appointments. There was 95% agreement between data entry forms and medical records. Of the 67 charts, 27 (40%) were independently reviewed by a second research assistant with 100% agreement between observers.

Independent measures. The integrity of the independent variable was assessed in several ways. When a patient could not be reached by telephone, a note was made on the data entry form. The number of patients in the M/T/P and T groups contacted by telephone was divided by the total number of patients. Telephone reminders were completed for 90% of patients. For the mailed reminder with parking pass, the number of mailed reminders that were not returned to sender was divided by the total number sent. Because some reminders might not have been returned, this division yielded only an approximate proportion of patients who actually received the mailed reminder. Only 1% of the mailed reminders were returned. The patients who were not reached by telephone or mail remained in their original assigned group for data analysis.

Social Validity

After the study, three questions using a 5-point Likert scale and one using a yes-no format were asked of the 18 health care providers in the clinic. The providers were asked to give their opinions about the importance of not kept and canceled appointments and of methods to improve appointment keeping (e.g., "Do you think not kept appointments are a problem?"). The Likert scores ranged from 1 (strongly yes) to 5 (strongly no). In addition, 46 randomly selected patients were informed about the three reminder combinations or

no reminder and asked to specify which they preferred.

RESULTS

Appointment keeping. One complex chi-square analysis was performed on the four groups (M/T/P, M/P, T, C) with three mutually exclusive outcomes (kept, cancel, not kept) and showed significance $\chi^2(6, N = 293) = 12.93, p < .04$. Further chi-square analyses were performed to look for significant differences between each intervention group and the control group and between each intervention group. The analyses indicated that all three groups were significantly different from the control group: M/T/P versus C, $\chi^2(2, N = 150) = 10.05, p < .01$; M/P versus C, $\chi^2(2, N = 148) = 7.03, p < .03$; T versus C, $\chi^2(2, N = 145) = 9.37, p < .01$. The differences between intervention groups were not significant. All three interventions produced lower but nonsignificant rates of appointments not kept than did the control group. The differences in kept appointments between groups were small and not significant. Figure 1 shows the higher percentages of canceled appointments and the percentages of appointments kept and not kept across intervention groups and the control group.

Call-appointment interval. Log linear statistical analysis of the interval between making the appointment and the appointment itself revealed a significant relationship between the length of the interval and the appointment result; this relationship was stable across the four groups. When the lag time was more than 4 weeks, the relative percentages of kept and canceled rates changed significantly: Kept rates fell from 63% to 47% and canceled rates rose from 18% to 34%, but not kept rates remained unchanged at 19%. The parameters for the lag time by appointment result interaction had a significant associated chi-square value, $\chi^2(4, N = 293) = 12.69, p < .02$. The interventions did not significantly affect the differences in outcome associated with the lag time. Figure 2 shows the higher percentage of kept appointments when the lag time was less than 4 weeks

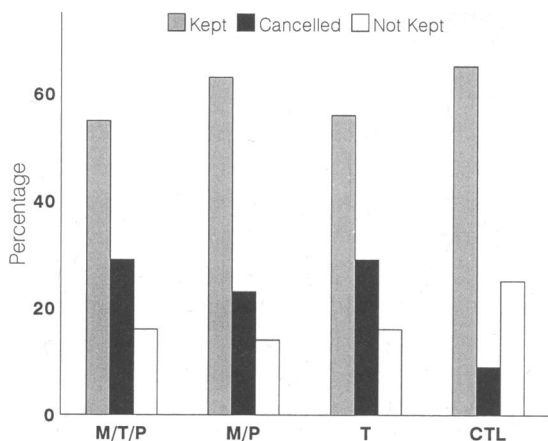


Figure 1. The percentages of appointments kept, canceled, and not kept per group. M/T/P = mail/telephone/pass group, M/P = mail/pass group, T = telephone-only group, and CTL = control group.

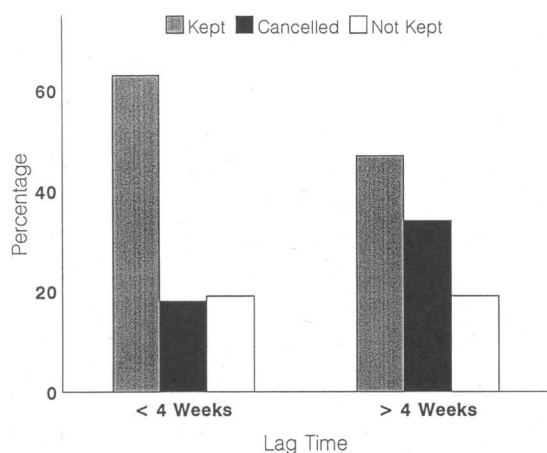


Figure 2. The percentages of appointments kept, cancelled, and not kept per lag time, across all treatment and control groups. < 4 weeks indicates time from scheduling to appointment equal to or less than 4 weeks, and > 4 weeks indicates time from scheduling to appointment greater than 4 weeks.

and the higher percentage of canceled appointments when the lag time was more than 4 weeks, regardless of group assignment.

Social validity. The providers strongly felt that appointments not kept were a problem in general ($N = 18$, Likert $M = 1.66$) and in the clinic where they worked ($N = 18$, Likert $M = 1.72$). Seventeen of 18 providers felt that appointments not kept were more of a problem than were canceled appointments (94%). Finally, the providers felt that an intervention that increased cancellations and decreased appointments not kept but did not affect appointments kept was valuable ($N = 18$, Likert $M = 2.1$). Some providers added comments that indicated their belief that a canceled appointment was a significant outcome because it allowed patients to reschedule, staff to fill in the open slot of time with another patient, and generally provided more productive use of staff time.

The patient satisfaction results from a total of 46 parents (12 M/T/P, 9 M/P, 15 T, and 10 C) indicated that 22 preferred the mail/pass (8 M/T/P, 4 M/P, 7 T, 3 C), 4 preferred the telephone (1 M/T/P, 1 M/P, 2 T), 11 preferred both mail/pass and telephone (2 M/T/P, 4 M/P, 3 T, 2 C) and 9 wanted no reminder (1 M/T/P, 3 T, 5 C). Thus, the majority of parents preferred an intervention other than the intervention they

received in the study (33 of 46, 71%). Of those parents who preferred the intervention they received, 6 of 12 (50%) kept their appointments. The results indicated that preferring an intervention and receiving that intervention produced equivocal outcomes.

DISCUSSION

The results indicated that all the interventions significantly increased the number of canceled appointments but did not change the number of appointments kept or not kept. There were no significant differences among the three combinations of components in kept, canceled, and not kept rates. Although the kept rates for the three treatment groups were not greater than the kept rate for the control group, the higher canceled rates for the treatment groups represent important improvements in appointment keeping, for at least three reasons. First, when a patient cancels an appointment, he or she has an opportunity to reschedule it and thus to maintain the continuity of health care (Hagerman, 1978; Levy & Claravall, 1977; Rice & Lutzker, 1984). Second, the contact with the clinic to cancel the appointment represents an

opportunity to communicate with the provider about the significance of the health concern. For example, a symptom that has temporarily subsided could cause a parent's concern to wane and thus cause cancellation of the appointment, but the symptom may only be in remission and still need attention. Third, a cancellation allows the clinic to schedule other patients or activities during the period released by the cancellation (Dunbar, Marshall, & Hovell, 1979). The social validity data from the providers in this study underscore the importance of increasing communication about patients' intentions not to keep appointments. Unfortunately, the record-keeping routines used in the pediatric clinic at the time of this study did not permit an analysis of when cancellations occurred, which patients rescheduled and were subsequently seen, and whether other patients were scheduled for the canceled time slots. Thus, the relationship between increased cancellations and improved continuity of care could not be documented in this study, but should be considered in future research.

The results of the present study differ from those of the Friman *et al.* (1985, 1987) studies, which were conducted in the same setting. In those studies, the combined treatment package not only produced significant decreases in appointments not kept but also produced significant increases in appointments kept. The most likely explanation for this difference is that the studies focused on essentially different populations. Friman *et al.* (1985, 1987) focused on patient-scheduled and first-time appointments, whereas this study focused on clinic-scheduled follow-up appointments for well-child care or acute illness follow-up, which are notoriously at risk for being not kept (Alpert, 1964; Andrews *et al.*, 1990; Barton, 1977; Gates & Colborn, 1976; Rice & Lutzker, 1984; Sackett & Snow, 1979). The reasons for the risk are manifold. For example, in some cases (perhaps many), the follow-up visit may be unnecessary, especially when a prescribed treatment regimen has been followed and the targeted illness has run its course. In other cases, patients do not return because they are dissatisfied with the care they received in the initial visit. In others, superseding events make the prescribed time for the appointment problematic. There are many other

possibilities (Alpert, 1964; Andrews *et al.*, 1990; Barton, 1977; Gates & Colborn, 1976; Sackett & Snow, 1979).

The different findings among studies suggest that to increase appointment keeping for patient-scheduled and first-time appointments, the entire treatment package is sufficient. But to significantly increase attendance at clinic-scheduled follow-up appointments, pediatric clinics may have to enhance the package with additional interventions. One possibility is suggested by the results of the analysis of the lag time between appointments. Independent of intervention group assignment, the length of time did make a significant difference in appointment-keeping rates: The greater the lag time, the more likely the patient was to cancel or not keep the scheduled appointment; this result is consistent with previous research (Benjamin-Bauman *et al.*, 1984). Future research should examine the effect of combining reduced lag time with reminders and reduced effort. Even more potent interventions may be necessary to improve appointment keeping for appointments scheduled 4 or more weeks in advance.

It is possible, however, that for the clinic-scheduled follow-up appointment, many clinics would be satisfied with increasing the proportion of cancellations. The social validity data indicated that the clinic staff members believed that appointments not kept were a big problem and that an intervention that increased cancellations without a concomitant increase in appointments kept would be valuable. Documenting the value of cancellations could be done with a better record-keeping system in the clinic. For example, if clinic personnel rather than research assistants made the telephone reminders, an appointment could be rescheduled at the time of the call and the open block of time could be filled. In addition, a note could be made of the cancellation and given to the provider with the telephone number of the patient so continuity could be improved.

The results indicated that equivalent effects were achieved by the simplest combination of a mailed reminder and the parking pass. This suggests that the telephone reminders were not necessary, which is important because not all patients have tele-

phones, and even when they do, they are not always available when called. Furthermore, the two interventions that included a telephone reminder (i.e., M/T/P and T) were the least preferred by the patients surveyed after the study. The mailed reminder is an inexpensive intervention (e.g., Barron, 1980; Frankel & Hovell, 1978; Friman et al., 1985, 1987; Gates & Colborn, 1976; Sackett & Snow, 1979).

The option of reducing effort with a parking pass is another matter, however. In fact, it may be unique to the present setting and was not investigated separately from the mailed reminder. Nonetheless, reducing effort to increase response rates is a phenomenon with longstanding empirical support (e.g., Solomon, 1948). A health care appointment involves a chain of events, each requiring effort and each presenting an opportunity for a reduction therein. For example, clinics are difficult to find in many hospitals, and clearer directions would reduce the effort needed to attend. Occupying children is difficult during the long waiting times at some clinics, and shortening the waiting times or providing child play areas would reduce parental effort.

Previous research showed two steps for improving appointment keeping for patient-scheduled and first-time pediatric appointments: Make it easier for patients to remember the appointment, and make it easier for them to attend (Friman et al., 1985, 1987). The present study indicates that although these two steps are not sufficient to increase the rate of clinic-scheduled follow-up appointments kept, they can increase the proportion of cancellations, which is a valued service for pediatric clinics.

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