Time and Money: Effects of No-Shows at a Family Practice Residency Clinic

Charity G. Moore, PhD; Patricia Wilson-Witherspoon, MD; Janice C. Probst, PhD

Background: When patients fail to appear for scheduled appointments, the flow of patient care is interrupted, and clinic productivity declines. This study investigated the impact of failed appointments on a clinic by measuring time and money lost after taking into account same-day treatment patients (walk-ins). Methods: Schedule information was retrieved for 4,055 visits over 20 business days. Data were collected on appointment status (show, no-show, cancel, walk-in), time allocated for the appointment, charges for visit, date and time of the visit, and other appointment information. Results: No-shows and cancellations represented 31.1% of scheduled appointments and 32.2% of scheduled time. Rates of failed appointments varied by type of provider, patient demographics, and patient status (new versus established). Walk-in patients replaced 61.0% of failed appointments but only 42.4% of the time blocked for those appointments. Walk-in visits generated 89.5% of the charges associated with scheduled visits. Over the course of a year, total revenue shortfalls could range from 3% to 14% of total clinic income. Conclusions: Failed appointments pose financial as well as administrative problems for residency practices. Proactive reminder systems are needed to promote patient attendance.

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When patients do not appear for scheduled appointments ("no-show"), the flow of patient care is interrupted, and clinic productivity declines. Patients who need immediate care must wait to be seen because time has been blocked for originally scheduled patients. Last-minute cancellations are less disruptive but can still create an administrative burden. The exact nature of the burden imposed on a family practice residency clinic by patients’ failure to keep appointments has not been extensively examined.

Reported no-show rates, not including cancellations, in family practice centers range from about 6% to 26.1%. In a recent study, however, some clinics self-reported no-show rates of more than 50%. Younger patients, men, patients with lower socioeconomic status, those with traditional medical assistance or no insurance, and patients who are divorced or widowed are more likely to miss appointments. Race or ethnicity, on the other hand, is not consistently related to no-show rates. Rates vary by day of appointment but not by time of appointment. Reasons for failure to appear include forgetfulness, lack of transportation, feeling better, lack of sense of urgency for the appointment, lengthy amount of time between scheduling and appointment, and short notice of the appointment. In a family practice residency, first-year residents and fourth-year medical students have higher rates of failed appointments than second- and third-year residents, faculty physicians, and nurse practitioners.

Most studies have analyzed the type of patient who fails to appear, without exploring the consequences of missed appointments for the clinic. A missed appointment is not necessarily a loss: if some patients fail to appear when scheduled, others seeking same-day care can be accommodated. The potential balance between no-shows and same-day patients, however, has not been explored. In addition, no research has evaluated the financial implications of no-shows for residency clinics. The present study explored the consequences of patients’ failure to appear in terms of time and money costs to a family practice residency clinic.
Methods

Population

The Family Practice Center (FPC) of Palmetto Richland Memorial Hospital/University of South Carolina is located in a metropolitan area of approximately 300,000 residents. The FPC is the primary practice location for 36 family practice residents and 13 family physician faculty, as well as two behavioral medicine faculty, two nurse practitioners, and two sports medicine fellows. The FPC records approximately 45,000 patient visits annually.

The population for our study was all scheduled and same-day visits made to the FPC during each of 4 months: November 1998, December 1998, January 1999, and May 1999. Five consecutive business days were sampled from each month. Subsequent analysis showed no difference in appointment keeping by month.

Design

Visits were retrospectively identified from hard-copy daily appointment schedules, sheets that are printed out daily and distributed to each reception area. Sheets are divided into 15-minute intervals; a patient visit may be allocated one or several of these intervals. While physicians occasionally change their own schedules, the standard template allows 15 minutes for a routine follow-up visit, 30 minutes for a complete physical examination, and 45 minutes to 1.5 hours for procedures. Sheets are updated manually as patients arrive. The names of walk-in or triage patients are written into unfilled, no-show, or cancellation slots. Updated insurance information and visit costs are noted for all patients.

Data Collected

The sample of 20 business days yielded 4,055 visits. The following information was abstracted from the schedule: patient number, appointment status (no-show, cancelled, walk-in or triage, or show), date and time of appointment, time allowed for the appointment, type of provider, and charges for the visit if the patient was seen. We did not attempt to verify the accuracy of schedule sheets by cross-checking with other sources, such as the patient record or billing. Once the visit database was created, demographic variables (age, gender, race, and zip code) were added from computerized patient records.

Analysis

The database of visits was stored in Microsoft Access '97 and all analyses were conducted using PC SAS Version 6.12 (SAS Institute Inc, Cary, NC). Statistical analysis examined frequency distributions and rates of appointment outcome for the center overall, by type of provider, by time of appointment, and by day of the week. Chi-square statistics were calculated and $P$ values obtained ($\alpha=.05$) to test differences in rates of failed appointments. Analyses excluded sports fellows, obstetric/gynecology and psychiatry rotators, and medical students, since these practitioners were assigned relatively few appointment slots (total of 185/4,055, 4.6%).

Two types of analyses were conducted. The first analysis was based on visits, regardless of time allotted. The second analysis explored the amount of time consumed by each patient seen or appointment missed. When a patient cancels an appointment that was scheduled for 30 minutes, for example, the available slot may be used by one 15-minute walk-in. Looking at patients seen, it would appear that recovery from the no-show was made. Looking at time, however, half of the no-show gap is not filled. Walk-in patients did not have a preplanned time allotment, since they had not been scheduled in advance. In the analyses, we allocated a 15-minute slot to each walk-in, due to the likelihood that these visits were for acute care. Lower average charges associated with walk-in visits, reported below, support this assumption. In addition, examination of a subsample of records ($n=606$) showed that a greater proportion of walk-in visits were associated with an acute problem (44.2% versus 28.8%), while lengthy visits such as physical examinations (14.0% versus 26.1%) and procedures (2.3% versus 4.8%) were less common.

Additional analysis compared rates of failed appointments across demographic variables. Distance to the practice was calculated using the centroid of the patient’s zip code. Because it was possible for a patient to have several appointments, generalized estimating equations were used to account for within-person correlation when investigating main effects of demographic variables using logistic regression.

Results

Total Appointments

On an average day, 155 patients had an appointment to be seen at the FPC (Table 1). Of these, on an average day, about 10 cancelled, and 38 patients failed to arrive for their appointments (6.5% and 24.4% of patients scheduled, respectively). Partially balancing the no-shows and cancellations, 29 patients arrived for same-day treatment via triage or walk-in. These 29 patients replaced 61.0% of the scheduled appointments that were either cancelled or no-shows. The “gap,” or unfilled patient appointments, was approximately 19 patients per day or 12.1% of scheduled appointments. Put another way, we did not recoup 39.0% of appointments lost through no-shows or cancellations.

Total Time Allocation

When we took into account the time allotted for each patient, the effect of failed appointments was slightly higher. Of all the time in minutes allocated for
scheduled patients, 6.8% went unfilled because patients cancelled, and 25.4% was unfilled through patients who failed to appear. Less than half of the time lost through failure to appear was recouped through same-day patients (42.4%). The gap between the time lost through failed appointments and that recouped through same-day patients was 57.6%.

**Appointments by Provider**

The percentage of patients arriving as scheduled varied by provider ($P < .001, df=8$) and ranged from 63.2% among second-year residents to 74.0% among faculty (Table 2). Third-year residents saw the greatest proportion of same-day patients relative to scheduled patients, giving them the lowest percentage of unfilled appointment slots (23.9%). Percentages of unfilled time were greater than the percentages of unfilled appointments for each type of medical practitioner (Table 3). Again, third-year residents had a lower percentage of unfilled time (38.0%), consistent with their lower percentage of unfilled slots.

Physician faculty had nearly three quarters of their patient care time filled by scheduled patients (72.4%); nurse practitioners had a similar “show” rate (71.1%). Faculty were less likely to see triage patients, making their appointment gap the largest among medical practitioners.

**Appointment Keeping by Patient Type**

New patients had a marginally higher rate of failure to keep appointments than established patients, 35.1% and 30.5% respectively (Fishers Exact test, $P=.102,$

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**Table 1**

<table>
<thead>
<tr>
<th>Summary of Patient Arrival Status by Visit and Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By Visit</strong></td>
</tr>
<tr>
<td>#</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Total scheduled patients</td>
</tr>
<tr>
<td>Patient arrived as scheduled</td>
</tr>
<tr>
<td>Patient cancelled</td>
</tr>
<tr>
<td>Patient failed to arrive (no-show)</td>
</tr>
<tr>
<td>Walk-in or triage patients</td>
</tr>
<tr>
<td>Unfilled slots</td>
</tr>
<tr>
<td>As % schedule</td>
</tr>
<tr>
<td>As % all failed appointments</td>
</tr>
</tbody>
</table>

* 20 business days, excluding behavioral medicine, sports medicine, rotators, and medical students
** Number of time units (in minutes) are not presented.
*** Gap: n=(no-shows + cancels) - walk-ins
% = no-shows + cancels - walk-ins

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**Table 2**

<table>
<thead>
<tr>
<th>Patient Arrival Status by Type of Provider, 20 Business Days*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provider</strong></td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>First-year Resident</td>
</tr>
<tr>
<td>Second-year Resident</td>
</tr>
<tr>
<td>Third-year Resident</td>
</tr>
<tr>
<td>Faculty</td>
</tr>
<tr>
<td>CFNP</td>
</tr>
</tbody>
</table>

* Excludes behavioral medicine, rotators, medical students, and sports fellows

Comparing shows to failed appointments across providers showed a statistically significant difference ($df=4, P=.001$).

Gap: n=no shows + cancels - walk-ins;
% = no shows + cancels - walk-ins

CFNP—certified family nurse practitioner
Appointment Keeping by Time of Appointment

Morning appointments were more likely to be kept (72.1%) than appointments made for the afternoon (65.8%), not taking into account the amount of time (Fishers exact test, P<.001, df=1). The likelihood of afternoon appointments being filled by walk-ins was similar to that of morning appointments (60.7% versus 58.0%). When accounting for time allotted, the percentage of time blocks filled by scheduled patients is higher in the morning than in the afternoon, 70.3% and 65.5%, respectively (Fishers exact test, P<.001, df=1). The recovery rates were similar in morning and afternoon, but in both cases, less time was filled than appointments: 41.1% of time in the morning and 41.7% in the afternoon.

Analysis by Day of the Week

Failed appointment rates ranged from 28.8% on Wednesdays to 32.0% on Thursdays (P=.683, df=4). Cancellation rates ranged from 4.9% on Fridays to 8.7% on Tuesdays. The relative difference between patients lost through no-show or cancellation and those gained by same-day scheduling was higher on Tuesday, both in percentage of unfilled appointments (52.2%) and in terms of time lost (61.3%). The gap percentages for all days of the week were greater for time than for appointment slots.

Appointment Keeping by Patient Characteristics

New patient visits were excluded from this analysis because the practice would not have any information about these patients if they failed to arrive. Walk-in visits were excluded because, by definition, these patients were not keeping a scheduled appointment.

Visits were made by 2,305 established patients. Seventy-one percent were female. About half of the patients (49.5%) were African-American, no race information was available for 29.2%, 20.1% were Caucasian, and the remaining 1.2% were of other races. The average patient age was 41.6 years (standard deviation [SD]=20.9), and the average distance traveled to the practice, measured by zip code, was 8.8 miles (SD=7.9). When we investigated the effect of each of these characteristics on failed appointments using both univariate and multivariate techniques, we found that females tended to be less likely to miss appointments than males (odds ratio [OR]=8; 95% confidence interval [CI]=.7,1.0; P=.06). Among patients for whom race information was available, African-Americans were 2.2 times more likely to miss appointments than Caucasian patients (95% CI=1.7, 2.7). Living distance from the clinic was not significantly associated with appointment failure. Older patients were less likely to no-show than younger patients, and appointment keeping increased with age. Thus, an older person was 1.18 times more likely to keep an appointment than a person 10 years younger (OR=1.18; CI=1.13,1.23). In multivariate analysis, age and race remained significant while gender and living distance from the clinic were nonsignificant.

Financial Analysis

Charges for a patient who is seen are usually written on the scheduler. Based on this information, the average charge for a walk-in or triage patient was estimated at $57.29. The average charge for a patient who arrives as scheduled was $64.03. This means that for each patient failing to show for an appointment, an estimated 89.5% financial recovery can be made by seeing a walk-in or triage patient.

To study the financial significance of failed appointments, we examined a typical day at the FPC. On average, 155 patients were scheduled (excluding behavioral medicine, rotators, medical students, and sports fellows). Charges for a patient who is seen are usually written on the scheduler. Based on this information, the average charge for a walk-in or triage patient was estimated at $57.29. The average charge for a patient who arrives as scheduled was $64.03. This means that for each patient failing to show for an appointment, an estimated 89.5% financial recovery can be made by seeing a walk-in or triage patient.

Table 3

<table>
<thead>
<tr>
<th>Provider</th>
<th>Arrived %</th>
<th>No-Show %</th>
<th>Cancel %</th>
<th>Walk-In as % of All Time</th>
<th>Gap** as % of Time Unfilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-year resident</td>
<td>64.7</td>
<td>29.1</td>
<td>6.2</td>
<td>10.6</td>
<td>69.9</td>
</tr>
<tr>
<td>Second-year resident</td>
<td>62.2</td>
<td>30.3</td>
<td>7.4</td>
<td>15.2</td>
<td>59.7</td>
</tr>
<tr>
<td>Third-year resident</td>
<td>67.1</td>
<td>25.5</td>
<td>7.3</td>
<td>20.3</td>
<td>38.1</td>
</tr>
<tr>
<td>Faculty</td>
<td>72.4</td>
<td>21.5</td>
<td>6.1</td>
<td>9.1</td>
<td>67.1</td>
</tr>
<tr>
<td>CFNP</td>
<td>71.1</td>
<td>22.2</td>
<td>6.8</td>
<td>12.5</td>
<td>56.9</td>
</tr>
</tbody>
</table>

* Excludes behavioral medicine, rotators, medical students, and sports fellows

** Gap % = no-shows + cancels + walk-ins / no-shows + cancels

CFNP—certified family nurse practitioner

Testing for differences across provider type: P=.001, df=8 for differences in arrival status, P=1, df=4 for gap, or unfilled time, by provider.
and sports medicine, rotators, and medical students), for a projected total revenue of $9,924.65. If 48 patients cancel or fail to show for an appointment, revenue lost would be approximately $3,073.44. Some of this income would be replaced by 29 walk-in patients, generating an estimated revenue of $1,661.41. The daily loss would total $1,412.03 or 14.2% of anticipated revenue. Projected losses across 250 working days per year would be $353,008.

Even if all 48 patients were replaced by 48 same-day patients (ie, full replacement of failed appointments), money would be lost because, as noted earlier, the average charge for a same-day patient is lower than for a scheduled patient. The average revenue generated by those 48 same-day patients would be $2,749.92, resulting in a loss of $323.52. Across 250 working days, even the small daily loss associated with full replacement of failed appointments would total $80,880 or 3.3% of potential income.

Discussion
Missed appointments are a common problem. Our detailed analysis of the effects of missed appointments on a residency practice emphasizes the difficulty in making up for “lost” time and the need to use proactive techniques to enhance patient attendance.

The combined rate for 24-hour cancellations and failed appointments at our practice (31.1%) is within the range of previously published findings. Walk-in (same-day) patients filled many of those appointment slots, leaving only 12.2% of all appointments unfilled by the close of the day. Patients were more likely to fail to keep scheduled appointments in the morning but more likely to appear for walk-in visits in the afternoon. As a result, missed morning appointments, when they occurred, were more likely to go unfilled. (It may be logistically impossible to replace morning no-shows with same-day patients.) At our clinic, for example, a patient is not identified as having missed an appointment until 20 minutes past his/her scheduled time of arrival. At the beginning of working hours, there are unlikely to be any patients waiting to be worked in who could fill the vacant morning slot.

Analysis of financial information emphasizes the importance of enhancing patient attendance. Same-day walk-in visits generate less income per visit than do scheduled patient appointments. Thus, even with no unfilled appointment slots, complete financial recovery would not occur. Over the course of the year, revenue shortfalls at a practice could range from 3%, assuming replacement of all scheduled patients by walk-ins, to 14%, assuming the level of replacement encountered in our study.

Patient reminders may be one means of reducing failed appointments. Older persons who are already established patients of the practice are least likely to need reminders to keep their appointments because their no-show rates are lowest. New patients and younger persons, either because they are less committed to the new clinician or because their schedules are more complicated by children and employment, are more likely to miss scheduled appointments. If reminder system resources are limited, focusing on new patients and parents of children is a feasible strategy.

Commenting on racial disparities in no-show rates is extremely difficult. Our clinic, a principal Medicaid provider in a downtown area, draws patients from several large, principally African-American public housing projects. Racial differences in no-show rates, in this case, are likely to be proxies for disparities associated with access to a telephone and convenient transportation.

The reviewed literature on interventions that enhance clinic attendance tends to focus on outcomes such as immunization rates or use of clinical preventive services rather than individual appointment keeping. Telephone interventions were deemed the most effective at improving immunization rates, although postcards and letters also improved rates. Telephone reminders that require the patient to commit verbally to a request to formally cancel appointments have been suggested as most effective. Thus, having the appointment clerk change standard remarks from “Please call if you have to cancel your appointment” to “Will you please call if you have to change your appointment?” would require the patient to acknowledge having heard the message and to commit to complying with the request. In a restaurant reservations setting, a similar change in phrasing reduced no-call no-shows from 30% to 10%. If patients who do not intend to come to clinic call in advance, it would be possible to do a better job of placing triage patients in unused morning appointments.

Limitations
Our study was limited in scope. It was conducted at a single residency practice in a Southern state. While prior research established that our patient population parallels patients visiting family physicians nationally in terms of clinical needs, residency patients may differ from others in demographic characteristics or appointment-keeping behavior. The analysis was also restricted to administrative information generated by the medical encounter; no attempt was made to interview patients who missed appointments to ascertain why they did not appear. Further research is needed to clarify situational barriers, such as inadequate transportation, that may be contributing to appointment failure. Research demonstrating cost-effective interventions for increasing patient adherence to appointment schedule is equally important.
Conclusions

Healing remains the heart of family practice, but practice management is its essential arm. As reimbursement for care is reduced, each appointment’s contribution to financial viability increases in importance. Our study has demonstrated the financial effect of missed appointments. Practitioners need office systems that decrease no-show rates to maximize office function and avoid unnecessary financial loss.

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REFERENCES