A Multi-Method Intervention to Reduce No-Shows in an Urban Residency Clinic

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BACKGROUND AND OBJECTIVES: Missed appointments can create financial, capacity, and continuity issues in primary care. An urban family medicine residency teaching clinic with a large culturally diverse population of low-income patients struggled for decades with a persistent no-show rate of 15%–17% despite multiple attempts to remind patients or otherwise address the problem. This study sought to measure the effects of a multi-method approach to decreasing the overall clinic no-show rate over time.

METHODS: A team of clinicians and staff undertook a systematic review of the literature to identify an approach to decreasing the number of no-show appointments while maintaining a commitment to the population and quality of care. The team implemented a three-stage process: an interview with the cohort of patients with the highest number of repeated no-show appointments, a double booking process for patients with a history of frequent missed appointments, and a change in the entire schedule to a modified advanced access schedule.

RESULTS: A cohort of 141 patients (2% of the practice population) accounted for almost 17% of the total missed appointments. The cohort differed from the overall clinic, being largely African American women on Medicaid with a large burden of medical comorbidities and a high prevalence of mental health issues. After the intervention, the rate of no-show appointments in the cohort fell from 33.3% to 17.7%, and the overall clinic rate fell from 10% to 7%; this decrease persisted for the 33-month observation period after the intervention and has been maintained to this date. The largest improvement in appointment keeping came after a modified advanced access schedule was implemented clinic-wide.

CONCLUSIONS: Indentifying a large at-risk population for no-shows and using a multi-method approach to addressing the issue can show persistent improvement and could be used in other residency training and community clinic settings.

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Missed clinical appointments —no-shows—pose a substantial systems problem in primary care. Unfilled appointments represent a loss of financial support and decreased efficiency and capacity to provide services, even in systems without financial barriers to care such as the National Health Service in the United Kingdom.[1,2]

United States studies describe no-show rates in community practices that range from 5%–55%.[3] Patients who fail appointments in primary care often use emergency departments as sources of both primary and chronic care, driving up costs and straining hospital systems.[4,5] Above all else, missed appointments compromise continuity and quality of care for both the patients who no-show and others who would have been scheduled in those appointment slots.[6]

Demographic variables associated with no-shows varied among several studies and depended upon practice-specific populations. Neal et al observed a three-fold increase in no-shows with patients who lived in a deprived area versus those who did not.[7] Majeroni et al found that missed appointments at their practice were higher for patients on Medicaid than those with other insurance.[8] Izard suggests that a small proportion of patients can comprise a disproportionately large amount of no-shows, implying that focusing on these patients might improve overall no-show rates.[9] A systematic review of interventions such as telephone or mailed reminders, double booking or shadow appointments, and advanced access scheduling showed

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mixed success in lowering no-show rates.[10] Advanced access scheduling as a principal component of patient-centered medical homes has been a central tenet of restructuring practices for primary care but has had mixed success with no-show patients.[11]

Wingra Family Medical Center, a residency teaching clinic of the University of Wisconsin Family Medicine Residency Program since 1973, serves a diverse population with a heavy representation of culturally diverse low-income patients. The clinic has a number of Spanish-speaking faculty and residents to meet the needs of the population. At the outset of the study, the clinic providers included eight faculty physicians, four physician assistants, and 12 family medicine residents, and the clinic had been in its current location since 1992. Despite the availability of a taxi service for Medicaid patients and reminder phone calls for upcoming appointments, the clinic has struggled with a high no-show rate. Historically over the decade prior to the study period, the no-show rate has ranged from 15%–17%, which is consistent with other studies of family medicine residency programs.[12] The purpose of this study was to assess the effectiveness of a multi-method intervention aimed at decreasing the no-show rate.

Methods

Population
In July 2008, near the beginning of the interventions, the clinic had a population of over 9,500 active patients and a volume of visits over 21,000 yearly. Using Clarity from EPIC health systems, we defined a cohort of no-show patients (NS cohort) who had missed six or more appointments in the 18-month period from May 2007 to June 2008. Demographic information of the total patient population and the cohort is presented in Table 1. Of note, the total patient population includes the individuals of the NS cohort, although the proportion of the total population made up by the cohort was deemed too small to skew comparisons.

The Intervention
A research group consisting of the clinic director, clinic manager, and representatives from staff and faculty examined the no-show history of the clinic and reviewed the existing

Table 1: Demographic Profile of No Show (NS) Cohort Versus Clinic Population*

Demographics	NS Cohort n=141	Wingra Patient Panel n=8,974	P Value
Gender			<.001
Female	114 (80.85%)	5,079 (56.60%)	
Male	27 (19.15%)	3,894 (43.39%)	
Ethnicity			<.001
African American/Black	98 (69.50%)	1,856 (20.68%)	
Caucasian/White	22 (15.60%)	4,275 (47.64%)	
Hispanic/Latino	17 (12.06%)	1,792 (19.97%)	
Other	4 (2.84%)	1,051 (11.71%)	
Age			.005
1–17	16 (11.35%)	1,948 (21.71%)	
18–25	27 (19.15%)	1,146 (12.77%)	
26–44	57 (40.43%)	3,006 (33.50%)	
45–64	34 (24.11%)	2,226 (24.80%)	
65+	5 (3.55%)	561 (6.25%)	
Payer			<.001
Medicaid	108 (76.60%)	2,132 (23.76%)	
Medicare	22 (15.60%)	803 (8.95%)	
Self-pay/none	3 (2.13%)	1,541 (17.17%)	
Private	6 (4.26%)	4,449 (49.58%)	
Other	2 (1.42%)	49 (5.45%)	

literature. The group interviewed clinic staff to gain an accurate understanding of current scheduling procedures and attempted to identify scheduling factors associated with no-shows. The group also conducted an open-ended survey, via in-person or telephone interviews, with individuals of the NS cohort to gather their opinions related to the causes of missed appointments. The results were consistent with the existing literature, listing factors such as transportation issues, personal and family issues, forgetfulness, a lack of respect patients felt from doctors and clinic staff, and generalized anxiety about illness and appointments.[13-15]

Based on the conclusions inferred from the above analyses, the group designed a multi-method intervention to decrease the clinic's no-show rate: (1) an educational program focused on the NS cohort that discussed the effects of no-shows, (2) a modified method of double-booking patients in providers' schedules, and (3) a modified advanced access scheduling system to replace the traditional scheduling model of the clinic.

Patient Education
On October 1, 2008, the clinic began the educational intervention for members of the NS cohort about the effects of their behavior on their health and clinic access. A scripted discourse was distributed among the receptionists to be given to cohort members when they contacted the clinic. The discourse communicated three points: (1) making patients aware of their frequent missed appointments, (2) describing the effects on the clinic and the patient's health, and (3) negotiating a commitment from the patient to improve appointment adherence. Clinicians were also asked to discuss these points with members of the cohort during their visit.

Modified Double Booking
Simultaneously, the clinic began a modified double-booking strategy, as described by Izard, for the NS cohort patients in selected provider schedules.[9] This intervention sought to protect patient flow by scheduling members of the NS cohort with a separate, virtual provider at two times: 9:30 am for the morning session and 2 pm for the afternoon session. If the patient arrived for their appointment, they were inserted into a clinician's schedule along with an existing appointment. Patients were notified of these new policies and their purpose at the end of the scripted discourse given upon their request for an appointment. Patients were identified as members of the cohort in the "comments" section of the EHR.

Advanced Access
Previous studies have demonstrated that the longer the interval between the date patients requested an appointment and the date they were seen, the higher the no-show rate.[16,17] The review of our clinic's appointment data prior to the beginning of the interventions confirmed these trends in our patient population with 8% no-shows when the interval between scheduling was 0–3 days compared with 16% when the interval was 4–6 days, and a maximum of 22% at 28–30 days.

These data helped found the decision to switch the clinic's scheduling system from a traditional model to an advanced access model, which is described by Murray et al.[18] This change began about 6 months after the initial set of counseling and double-booking interventions. Intensive communication efforts with patients and clinic staff were made in preparation for this change. All patients were informed via a personal mailing and a placard on display in the waiting area. Clinic staff members were trained in the new scheduling procedures, and reception staff were provided with scripted language to describe the new scheduling procedure to patients scheduling appointments in-person and by phone. After 4 months following the transition, the advanced access scheduling process was modified to permit scheduling of planned annual health visits or follow-up visits for chronic conditions. A portion of the feedback related to the system reported patients' difficulties associated with the inability to schedule appointments in advance, a feature that was useful in organizing their work or family life. Only patients who had demonstrated high appointment adherence in the past were permitted to schedule appointments in advance.

Outcome Measures
All data were collected via the Wisconsin Department of Family Medicine's Clinical Data Warehouse, a continuously populated subset of clinical data from the EPIC electronic health record of the University of Wisconsin Medical Foundation. A demographic and health profile was created for both the cohort and total patient population. The no-show rate and the proportion of active patients (defined as a patient who had scheduled at least one appointment with the clinic over a 24-month period) were collected. We measured the active patient variable to determine whether patients, especially those of the NS cohort, would continue to use the clinic after the interventions. The no-show rate was measured for both the total patient population and the NS cohort 33 months before the first intervention in October 2008 and 33 months afterward (total study period: January 2006–June 2011). Chi-square tests were used to assess differences in the no-show rates and the number of active patients before and after the interventions were introduced. A significance level of 0.05 was assumed for all tests. This study was exempted by the Institutional Review Board of the University of Wisconsin School of Medicine and Public Health and approved as a multi-site study by the Wisconsin Institutional Review Board Consortium.

Results
Data from 364,561 appointments and 9,115 patients were analyzed. The NS cohort, although 2% of the

total practice population, accounted for almost one sixth of all no-shows in the pre-intervention time period. The profile of the NS cohort and total patient population revealed significant differences between the groups, as demonstrated in Tables 1 and 2. In comparison with the practice population, members of the NS cohort were largely female, African-American/Black, and on Medicaid.

Other significant differences between groups were the ratio of patients diagnosed with hypertension, obesity, tobacco use/abuse, and the overall burden of psychosocial illness, such as depression, anxiety, and PTSD, with 52.5% of the NS cohort having one or more psychiatric diagnosis verus 19.5% in the overall population.

Over the course of the intervention the no-show rate decreased in both the NS cohort and overall clinic population (Figures 1 and 2). The mean rate for the clinic dropped from 10% before the intervention to 7.06% after the intervention ($P<$ .001), translating into an estimated 6,086 more scheduled appointments completed. The mean rate for the NS cohort dropped from 33.26%

Table 2: Health Profile of No-Show (NS) Cohort Versus Clinic Population*, **, †

Demographics	NS Cohort (n=141)	Wingra Patient Panel (n=8,974)	P Value
Chronic physical conditions (n)			<.001
0	85 (60.28%)	7,501 (83.59%)	
1	44 (31.21%)	1,305 (14.54%)	
2	12 (8.51%)	168 (1.87%)	
Chronic physical conditions (cat.)			
Hypertension	53 (37.59%)	1,717 (19.13%)	<.001
Obesity	45 (31.91%)	1,140 (12.70%)	<.001
Asthma	34 (24.11%)	983 (10.95%)	<.001
Gastroesophageal reflux disease (GERD)	34 (24.11%)	896 (9.98%)	<.001
Diabetes II	34 (24.11%)	745 (8.30%)	<.001
Chronic obstructive pulmonary disease (COPD)	15 (10.64%)	327 (3.64%)	<.001
Psychosocial conditions (n)			<.001
0	67 (47.52%)	7,226 (80.52%)	
1	56 (39.72%)	1,449 (16.15%)	
2	15 (10.64%)	260 (2.90%)	
3	3 (2.13%)	36 (0.40%)	
Psychosocial nonditions (cat.)			
Depression	67 (47.52%)	1,600 (17.83%)	<.001
Panic/anxiety	19 (13.48%)	332 (3.70%)	<.001
Post-traumatic stress disorder (PTSD)	8 (5.67%)	128 (1.43%)	<.001
Bipolar/schhizophrenia	1 (0.71%)	29 (0.32%)	.374
Substance use/abuse			
Tobacco	48 (34.04%)	1,034 (11.52%)	<.001

* Data were collected at the time of the first intervention in October, 2008
** Health conditions were quantified in terms of the number (n) of diagnoses in an individual patient within a category and the total number of patients with a given diagnosis in a category
† The number of patients within each variable might not sum to exactly equal the total number of patients reported in the first row due to the collection system placing patients in more than one category or failing to place them in any category. The percentages might not add to 100 due to rounding.

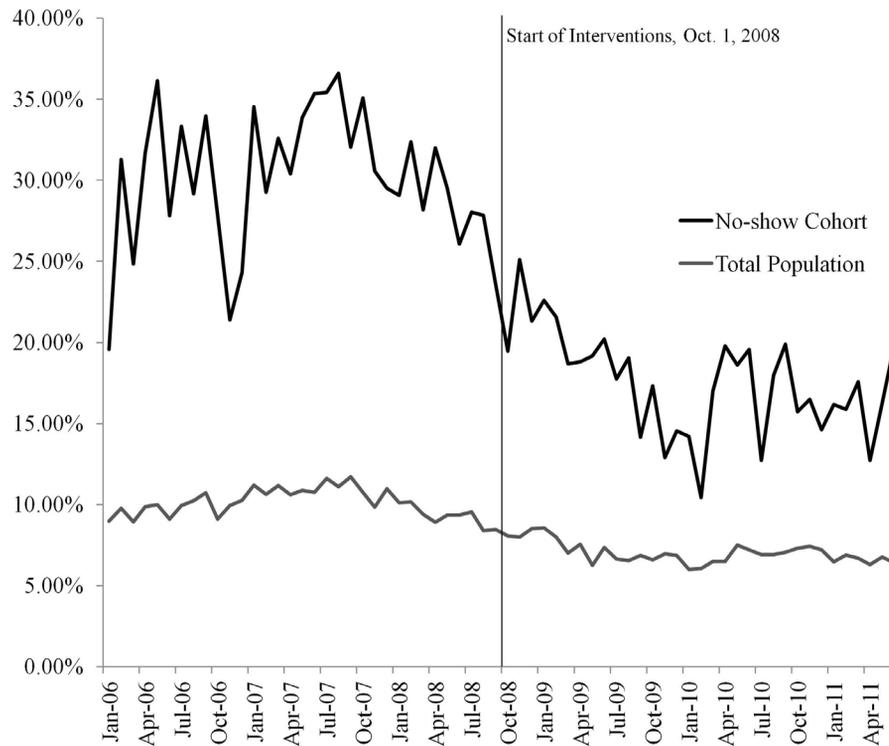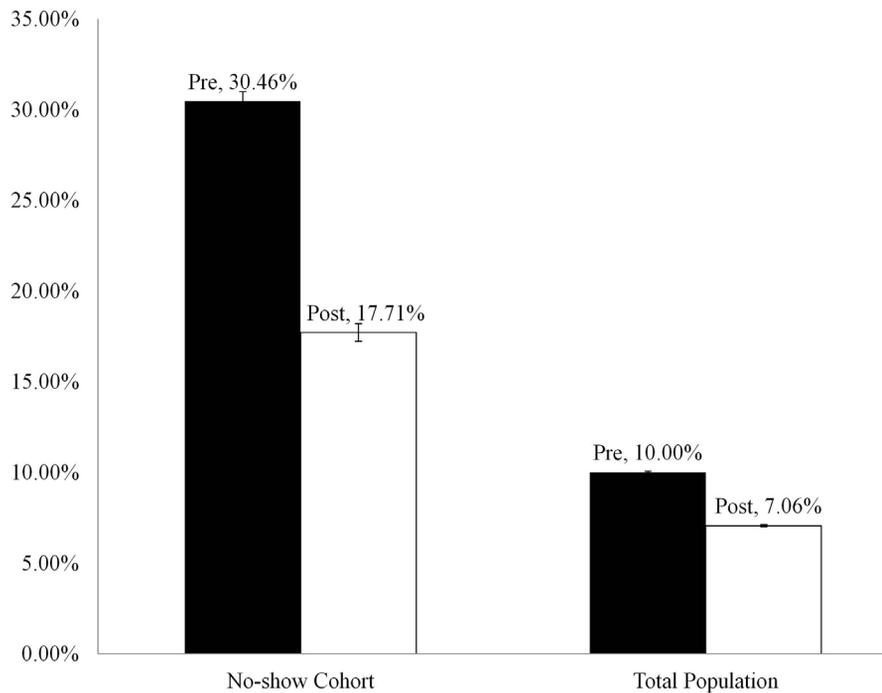**Figure 1: No-Show Rate of Cohort and Total Population Versus Time**

Figure 2: No-Show Rate of Cohort and Total Population, Before and After Intervention*, **

* Rates were significantly lower for both groups after the intervention ($P<.0001$)
** Error bars reflect the 95% confidence interval for each estimate of the mean.

at baseline to 17.71% (*P*<.001). This reduction has been sustained in the 4 years since the intervention. No-show rates showed steady declines over the study period with a more irregular pattern with the NS cohort relative to the total patient population. The number of active patients did not significantly change in the NS cohort but increased with statistical significance in the total patient panel (Figure 3).

Discussion

In our study, the intervention entails multiple components founded on research of clinic-specific data and literature, and the study assesses the effects of this intervention on both the clinic's entire patient population as well as a subset of patients who were observed to be at high risk for missing appointments.

The NS Cohort
Our results suggest that the interventions reduced the no-show rate in both the NS cohort and total patient population without deterring patients from using the clinic (the proportion of active patients in the cohort did not significantly change, and the proportion of the total population actually increased with statistical significance). Identification of and attention to a targeted high-risk population is essential, we believe, to improving outcomes. Recent reports of what has been called "high intensity primary care" demonstrate benefits to intensive management of patient cohorts for chronic health problems and, in our case, patients who fail to obtain needed services because of failed appointment keeping.[19] Our experience showed that the NS cohort had a substantially higher population of Medicaid and Medicare disability patients than the general population, with a heavy psychological burden, strengthening the association between no-shows and chronic physical and psychological disorders also found by Ciechanowski et al and Cashman et al.[20,21] A much larger percentage of patients at our clinic come from low-income neighborhoods compared with the other five residency clinics and 25 community practices in the University of Wisconsin system.

Guse and colleagues demonstrated the positive effect of patient education on a high no-show cohort of patients, which we believe was one element in our intervention that affected behavior in our NS cohort.[22] While a qualitative study of provider attitudes about repeat no-show patients revealed strongly negative views of them as patients,[23] our interviews with that group of patients provided insight not only into why patients found it difficult to keep appointments but also into their lives, giving us a sense of the struggles they face in managing the complexity of family, money, and emotional and physical health. Moreover, engaging these patients before implementation of the intervention might have in itself contributed to their improved behavior—a theory supported by observing that the sustained

Figure 3: Number of Active Patients, Before and After Intervention*, *
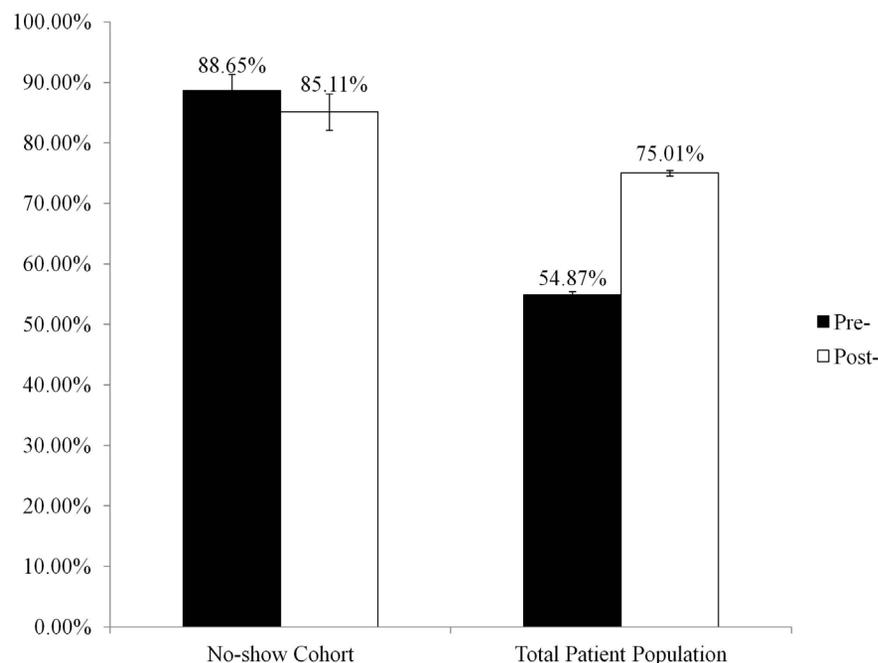
* The difference in the proportion of active patients in the no-show cohort was not statistically significicnt (*P*=.38), whereas the proportion in the Total Patient Population significantly increased (*P*<.0001).
** Error bars reflect the 95% confidence interval for each estimate of the mean.

decline in the cohort's no-rate begins before the start of the formal intervention (Figure 1). One lesson from our study may be that seeking information from any cohort of high-risk patients through personal, respectful, and supportive contact both improves health care providers' the understanding of their patients' individual and collective issues and may decrease anxiety that those patients may have about seeking care.

Sustainability in Changing the Practice

A number of studies have looked at the difficulty in using various practice changes in changing and sustaining decreases in no-shows. Studies in other residency settings have shown mixed results of advanced access scheduling related to no-shows.[24-26,27] The results in our study are consistent with a systematic review of advanced access that concludes that the scheduling system can contribute to lower wait times and no-show rates.[12] Our study also demonstrated significant improvement in time to third next available appointment, a common measure of access.

The ability of the clinic to sustain the lower no-show rate reflects the commitment of the providers and staff to continually educate the patients and to show flexibility when older patients and patients with chronic illness found a complete advanced access schedule to be problematic. Also, patients who had to prearrange job coverage or child care insisted on being able to schedule appointments in advance and so, for many providers, their schedules were altered to have 50% same-day appointments. The persistence of the NS cohort having a rate higher than the overall clinic population demonstrates the continuing difficulty they have managing their complex lives as well as the flaws in a clinic-centered system of care when outreach and other approaches to population care might offer better solutions but are difficult to reconcile

with a fee-for-service reimbursement system.

We felt that the primary reason for the overall improvement and sustainability is that our approach was consistent with the mixed methods approach and staff and provider commitment that Johnson et al found in their study of effective measures for decreasing no-show appointments.[12] Persistence over time rather than shorter-term measures may have helped the success of the intervention, moving the practice organization from "innovation" mode to what has become the standard of scheduling and practice.[28] The specifics of our clinic population undoubtedly had some effect as well. Although the clinic population overall at the time had a 24% rate of Medicaid patients, a high rate of patients on Social Security disability and a percentage of uninsured/self-pay patients (17%) higher than many urban family medicine residency programs, the 40-year presence of the clinic in the same community and the prevalence of Spanish-speaking faculty members created a high degree of loyalty of patients despite the changing nature of a residency clinic. This observation is consistent with a study of 16 community health centers in Boston that found that there were site-specific factors that positively or negatively affected the no-show rate.[29] Our approach considered both site-specific issues as well as the benefit of others' experience with similar challenges.

Our study suffers from the same limitations of many community-based studies in that, because of the lack of interoperability of EHRs, we were unable to track patients who went to other health systems or urgent care or emergency rooms over the 2.5 years since the beginning of the study. The inherent turnover of providers in residency teaching clinics makes generalization of our study to other urban low-income nonteaching clinics more difficult. The mix of providers and no-show rates was of insufficient volume to demonstrate individual effects, if there

were any, of changes over the time of the study. In that regard, our study differs from the results of a general internal medicine continuity clinic where residents had a much higher no-show rate than faculty.[4] Finally, our study assessed the effects of an intervention that entailed multiple components, thereby making it difficult to assess the independent effect of each. Although we believe that each component played a part in the lowering the no-show rate, testing the reproducibility or our results is limited unless one implements all the components of our intervention.

The multi-method approach described in our study used evidence-based sources for planning and implementation and has the potential to be useful for other residency training clinics and clinical programs that have populations similar to ours. Future research should assess the association between missed appointments and specific health outcomes.

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