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Telephone reminders reduce no-shows: A quality initiative at a breast imaging center☆

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ABSTRACT

Purpose: To improve the workflow and productivity at a Breast Imaging Center, primarily by decreasing the no-show rate.

Materials and methods: Mammography clinic data were recorded and analyzed for a 6-month period prior to our intervention. Personal pre-appointment phone calls were then instituted for all patients, following which data was recorded and analyzed for a 2-month period. Analyses compared pre- and post-intervention data.

Results: No-shows were significantly reduced ($p < 0.001$) from 20.99% (907/3775) pre-intervention to 7.07% (69/976) post-intervention. Calling ahead to cancel an appointment from those who either were no-shows or canceled their appointment significantly improved ($p < 0.001$) from only 2.81% (22/784) calling to cancel pre-intervention to 25.00% (23/92) calling to cancel post-intervention.

Conclusions: Through systematic pre-appointment phone calls and documentation, we were able to achieve a very significant decrease in the no-show rate at our Breast Imaging Center. We believe that our intervention can be useful for other radiology groups to implement in their practices to reduce no-show rates.

1. Introduction

Patients failing to show up for scheduled outpatient appointments is a widespread problem throughout medicine [1,2]. Patients showing up for scheduled appointments is essential for running a streamlined practice [3,4]. This minimizes wait times for patients and downtime for staff which should improve patient satisfaction, patient care, as well as the bottom line for medical practices [2–6]. According to a published literature review from 2018, the overall average no-show rate is 23.0%, with a range from 4.0% to 79.2% depending on medical specialty [7]. This extensive literature review did not reference any studies examining no-show rates in radiology.

Cost, transportation, coordination and forgotten appointments were identified as the top reasons provided by patients for missed appointments [8]. Those patients likely to miss appointments often had histories of missed appointments and decreased understanding of the purpose of the appointment [8]. Marginalized patient populations such as Black and Hispanic, immigrant, and low-income patients are less likely to attend appointments [9–11].

Several interventions reduced no-show rates in medical clinics. Reminder phone calls decreased no-show rates in outpatient clinics and were more effective than automated reminder messages [5,12]. Text message reminders reduced no-show rates in outpatient clinics [12]. Also, over-booking can temper the negative impact of no-shows by increasing the number of scheduled patients; however, this has the potential to increase patient wait times [1,4,13–15].

There is limited literature examining no-show rates in radiology. One study examined no-show rates for scheduled CT, MRI and ultrasound examinations, and also analyzed possible contributing patient-related characteristics; however, this study did not enact any intervention to improve the no-show rate [16]. A prospective study demonstrated decreased no-show rates in patients who received text message reminders for their outpatient MRI appointments [17]. Retrospective studies found that mammography has higher no-show rates than other imaging modalities [18,19].

This study at our breast-imaging center seeks to improve workflow and productivity, primarily by decreasing the no-show rate. To our knowledge, this is the first study to examine the impact of telephone

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reminders on no-show rates in the outpatient radiology setting. This study is also the first to prospectively study no-show rates for outpatient breast imaging.

2. Materials and method

2.1. Participants and setting

This Institutional Review Board approved study was conducted at a breast-imaging center. We analyzed mammography clinic data over a 6-month period from August 2014 through February 2015 prior to our intervention. In March 2015 we implemented our intervention and began prospectively recording the results of patient phone calls and of scheduled appointments on standardized forms. Data collection was paused for one week so as to create a clear demarcation between the pre- and post-intervention periods. Post-intervention data were recorded during March and April of 2015.

Patients were excluded if their exams were canceled for reasons outside of the patients' control. This included issues with insurance coverage of screening mammograms and the doctor's decision to cancel the exam. In the pre-intervention group, 73 patients were excluded. In the post-intervention group, 38 patients were excluded. Data from 3630 pre-intervention patients and 976 post-intervention patients were analyzed.

2.2. Intervention framework

An interdisciplinary team of radiologists, technicians, nurses, administrators, and clerical staff at our Breast Imaging Center was established with the primary goal of streamlining workflow, and improving both productivity and patient satisfaction. We conducted a preliminary internal quality improvement review to uncover potential issues at our breast-imaging center and how they could be addressed.

Our team leaders included an attending radiologist who has headed quality improvement for the radiology department for nearly 15 years, as well as an attending radiologist with > 20 years of experience in breast imaging. Team discussion revealed multiple contributing factors to decreased productivity. Initial anecdotal findings suggested that a large proportion of scheduled exams were not being performed. Causes for unfulfilled appointments were multiple; contributing factors included issues with patients, staff, communication, processes and technical components (Fig. 1). Utilizing the Pareto principle, which postulates that 80% of the effects are explained by 20% of the causes [20], patients scheduled for mammography that did not show up for their appointments (no-shows) were identified as the largest contributing factor to our suboptimal productivity. Accordingly, decreasing the no-show rate was set as our primary endpoint. Improved patient communication was targeted as our primary area for improvement, as it was felt to be the single controllable area with the greatest potential to impact the no-show rate.

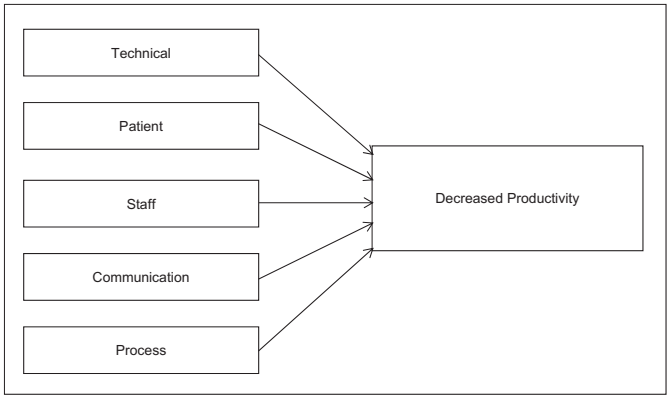

Fig. 1. Factors contributing to decreased productivity.

2.3. Intervention implementation

A major initiative was to institute personal pre-appointment phone calls. All phone calls were made between 1 and 3 days prior to the patients' scheduled appointments. A script was created and edited in conjunction with our interdisciplinary team. Further meetings were held during which the clerical staff was trained on how to communicate and record communication with patients. Included in this correspondence were in-depth reminders of the prerequisite items required at the time of appointment, such as identification, insurance information, and prescriptions. Translational services, if needed, were utilized. In the event that a patient was not reachable, a detailed voice messages was left. Our clerical staff made phone-calls during normal working hours at no additional cost to the department. This was easily accomplished, as the 30 daily patient phone calls were divided among 3 staff members, each spending approximately 30 min per day. In addition, to better enable patients to confirm appointments, we established a dedicated e-mailbox and phone line which patients could use to cancel or reschedule appointments.

2.4. Statistical analysis

Categorical variables were described with frequency and percent. Categorical variables were compared with the Pearson chi square test except when cell size was < 5 and where the Fisher's exact test was used. All p-values were two-tailed. Stata SE Version 13.1 was used for the analyses [21].

3. Results

Table 1 shows the comparison of patient examination appointments pre- and post-intervention. After the intervention, no-shows were significantly reduced ($p < 0.001$) by almost 14% from 20.99% to 7.07% (also see Fig. 2). Analyses comparing examination appointment type showed that screening mammogram ($p < 0.001$), diagnostic mammogram ($p < 0.001$), breast ultrasound ($p < 0.001$), and additional views – mammography ($p = 0.001$) had no-show examination appointment significantly reduced for each examination appointment type from pre- to post-intervention. Significant percentage change

Table 1
Comparison of patient examination appointments pre- and post-intervention.

Variable	Pre-intervention n (%)	Post-intervention n (%)	p-Value
Entire sample			< 0.001
Showed-up	2868 (79.01)	907 (92.93)	
No-show	762 (20.99)	69 (7.07)	
Screening mammogram			< 0.001
Showed-up	1459 (77.44)	512 (92.25)	
No-show	425 (22.56)	43 (7.75)	
Diagnostic mammogram			< 0.001
Showed-up	512 (76.76)	145 (94.77)	
No-show	155 (23.24)	8 (5.23)	
Breast biopsy			0.69
Showed-up	203 (96.21)	53 (98.15)	
No-show	8 (3.79)	1 (1.85)	
Breast ultrasound			< 0.001
Showed-up	760 (81.11)	218 (93.97)	
No-show	177 (18.89)	14 (6.03)	
Additional views – mammography			0.001
Showed-up	288 (80.00)	79 (95.18)	
No-show	72 (20.00)	4 (4.82)	

Note: Some patients were scheduled for more than one examination appointment on the same day.

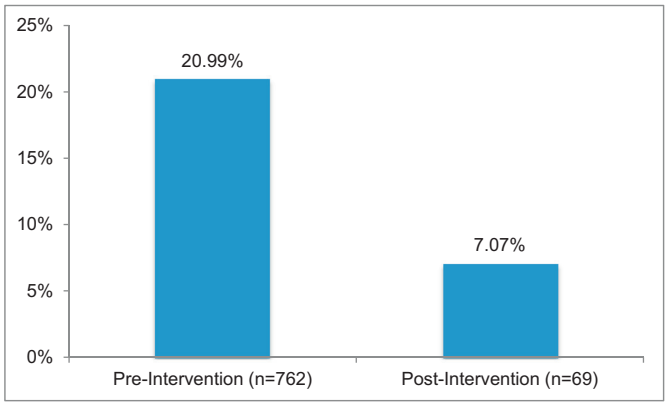

Fig. 2. Comparisons for no-show percentages in the entire sample ($p < 0.001$).

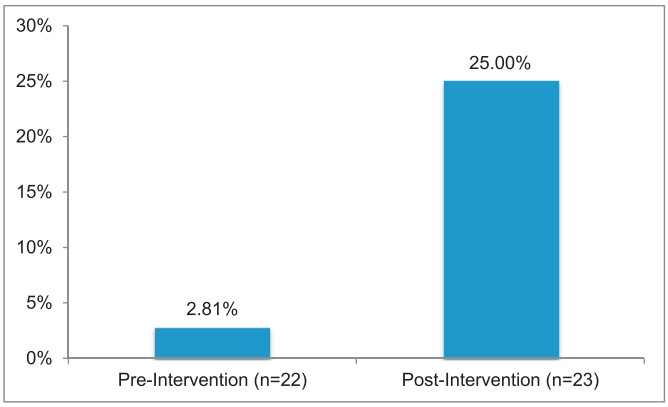

Fig. 3. Comparisons for calling ahead to cancel for those who were no-shows or canceled their appointment ($p < 0.001$).

reductions from pre to post-intervention ranged from 12.86% for breast ultrasound to 18.01% for diagnostic mammogram. Breast biopsy appointment did not significantly change from pre- to post-intervention.

Fig. 3 shows comparisons for calling ahead to cancel an appointment from those who either were no-shows or canceled their appointment. This was significantly improved ($p < 0.001$) from only 2.81% (22/784) calling to cancel pre-intervention to 25.00% (23/92) calling to cancel post-intervention. Missing paperwork at the time of appointment did not significantly differ ($p = 0.17$) from pre-intervention of 2.25% (66/2868) to post-intervention of 1.52% (14/907).

Patients who either did not provide a phone number or who did not have a working phone number were 4.00% (39/976) of the post-intervention group. For no-shows, this consisted of 51.28% (20/39). For those who showed-up, this consisted of 2.09% (19/907). No pre-intervention data were available for this phone number content. No patients used the dedicated e-mailbox to cancel or reschedule appointments.

4. Discussion

Through interdisciplinary discussion we were able to identify the high no-show rate as a problem in our mammography. A relatively easy-to-implement set of interventions was formulated and executed. Through improved patient communication, via pre-appointment phone calls and documentation, we were able to achieve a significant decrease in the no-show at our Breast Imaging Center.

Our pre-intervention no-show rates were higher (20.99%) than those of previous studies examining breast imaging (6.99–10.2%) [18,19]. In the post-intervention group, our no-show rate fell to a level similar to that of these prior studies [18,19]. Prior studies show that mammography has higher no-show rates than other imaging modalities [18,19]. We similarly found high no-show rates in our study. One of these studies also showed that more targeted imaging modalities, such as PET and MRI had the lowest no-show rates [19]. Imaging exams such as CT, MRI and PET are more likely to be ordered for symptoms or evaluation of known disease [22]. We speculate that a major contributing factor to these differences in no-show rates is that patients presenting with symptomatology and known disease would logically be more motivated to show-up for appointments. Mammography is different in that these patients are largely asymptomatic and are either scheduled for a screening exam or follow-up imaging based on the recommendation of the radiologist [23]. We would therefore expect that no-show rates for mammography might be higher than for modalities such as CT and MRI.

Our data also showed a trend of decreased no-shows for patients scheduled for biopsy (1.85–3.79%), than patients scheduled for breast imaging in general (7.07–20.99%). This is likely attributable to reasons similar to those outlined in the previous paragraph. These patients have findings that they and/or the radiologist felt to be highly suspicious and are motivated to show-up in order to get a tissue diagnosis.

A study limitation is that demographic information was not recorded. Many of our patients are Spanish speaking and have lower socio-economic status. Previous non-radiology studies report positive correlations for language proficiency and socioeconomic status with no-show rates [24,25]. Future research should study how our intervention would improve no-show rates for Spanish speaking patients and of lower socio-economic status as compared to native English-speakers and those of middle and upper socio-economic status. Also, our post-intervention group had data collected for only two months duration and included 976 patients while the pre-intervention group had data collected for six months duration and included 3630 patients. There were internal debates within the department about whether the new approach was useful and also whether there was a need to dedicate research resources to continue to collect and record data. The statistical analyses for data for post-intervention at only two months were exceedingly obvious that a large statistically significant difference in no-show rates had already been clearly demonstrated with the new approach. As such, it was decided that there was no need to dedicate research resources to continue to collect and record data, as the new approach was useful and should be continued.

5. Conclusions

Through systematic pre-appointment phone calls and documentation, we were able to achieve a very significant improvement in the no-show rate at our Breast Imaging Center. We anticipate applying similar methodologies and techniques in an effort to improve no-show rates in other key sections within our radiology department, our institution, and beyond. Given the data we have collected, further actions we will pursue include systematically reconfirming patient contact information at each appointment. We have also discussed adding pre-appointment emails in order to provide patients with an additional reminder, as well as to give them time to assemble all documents necessary for their appointments. By continuing to accrue data regarding patients' reasons for missing appointments, we expect to be able to devise further interventions to improve workflow and patient care. We believe that our intervention can be useful for other radiology groups to implement in their practices to reduce no-show rates.

Declarations of interest

None.

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