

The Effect of Paging Reminders on Fellowship Conference Attendance: A Multi-Program Randomized Crossover Study

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ABSTRACT

Background Educational conferences have long served as a foundation of medical education. Sending reminder text pages prior to the start of conferences is a method that may be employed to enhance conference attendance.

Objective The goal of our study was to determine if routine text paging before regularly scheduled conferences improves attendance among fellows in 3 internal medicine programs.

Methods A prospective, randomized, crossover study included 3 fellowship programs: pulmonary and critical care, cardiovascular disease, and hematology-oncology. The study was performed between October 2014 and March 2015. All fellows were included and randomized to 1 of 2 groups (with subsequent crossover to opposite group): Pages or No Pages. Paging reminders, which included conference title, location, and time, were sent 30 minutes prior to every conference for those in the intervention arm. Attendance was collected through a standard attendance log using self-registration.

Results A total of 46 fellows and 156 conferences were included for analysis, with 75 during the first 3 months and 81 during the second 3 months. There were no differences in individual overall attendance between randomized groups for the entire study period (42.9% versus 46.5%, $P = .46$). Paging reminders had no effect on overall individual attendance (43.7% versus 45.6%, $P = .50$). In addition, no significant differences were identified for individuals within each fellowship and training year.

Conclusions Paging reminders prior to a regularly scheduled conference had no effect on overall attendance in this study. Fellows reported that clinical obligations were a major barrier to conference attendance.

Introduction

Educational conferences have long served as a foundation for conveying didactic content in medical education, and significant energy is dedicated to organizing and preparing conferences for groups of learners. Conferences at the graduate medical education level often involve a variety of learning styles and employ previous experience as a teaching tool. Despite this, attendance at conferences in graduate training can vary greatly due to the multitude of demands on trainees' time and clinical responsibilities. The literature shows poor attendance at regularly scheduled conferences, with studies reporting average attendance rates ranging from 30% to 50%.¹⁻⁴

Previous research has attempted to determine factors associated with attendance at weekly conferences. These studies demonstrate that trainee attendance at conferences is affected by the date within the academic year, the year of training, and performance

on United States Medical Licensing Examinations.²

The presence of food at conferences has also been shown to improve resident and fellow attendance.^{2,5} Regarding faculty attendance, the presence of food does not seem to have the same effect, although continuing medical education credit may improve overall attendance.^{6,7}

Sending reminder text pages to trainees prior to the start of conferences is a method that may be employed to enhance conference attendance. The goal of our study was to determine if routine text paging before regularly scheduled conferences improved attendance among fellows in 3 internal medicine fellowship programs. We hypothesized that reminder pages would improve conference attendance for all fellows.

Methods

We performed a prospective, randomized crossover study that included 3 fellowship programs at our institution: pulmonary and critical care, cardiovascular disease, and hematology-oncology. Each fellowship is 3 years in duration, with the majority of

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Editor's Note: The online version of this study contains the survey tool and a table of survey data.

clinical rotations occurring during the first year of training. The study was performed between October 2014 and March 2015. Conference selection included the regularly scheduled key educational conferences, at which attendance is expected within each fellowship. The conferences included for all fellowships were chosen by the investigators based on educational emphasis, previously identified poor attendance, and location and time of each conference. Target conferences included 3 pulmonary, 4 cardiology, and 2 hematology conferences. All active fellows in each program, except study investigators, were included in the study. None of the fellowship programs studied have a mandatory conference attendance requirement for graduation, but conference attendance is tracked in all 3 programs. Deficiencies in attendance are noted in midyear trainee reviews and within the “professionalism” core competency performance for trainees.

Randomization and Groupings

All fellows were randomized to 1 of 2 groups: Pages or No Pages. Given the propensity for greater clinical responsibilities during the first year, a stratified randomization was employed based on year of training. Once all fellows were stratified, a random number generator was used with 1:1 randomization to either group. After the initial 3 months, participants in each group were crossed over to the opposite group (FIGURE 1).

What was known and gap

Programs spend considerable time and resources on didactic conferences, yet trainee attendance varies due to multiple demands placed on their time.

What is new

A prospective, randomized crossover trial of paging reminders for conferences in 3 internal medicine fellowships.

Limitations

Single specialty, single institution study limits generalizability.

Bottom line

Paging reminders did not improve fellow attendance at conferences. Fellows reported that clinical obligations were a common barrier to conference participation.

Intervention and Control

Paging reminders, which included conference title, location, and time, were sent 30 minutes before every conference for those in the intervention arm. Those in the control arm did not receive these pages but received the usual weekly reminder e-mails regarding conferences for the following week. They also had access to their respective fellowship’s conference calendar.

Data Collection

A standard attendance log using self sign-in for each conference was used. These data were subsequently entered into an online data repository by program coordinators not affiliated with the study design and unaware of the groupings.

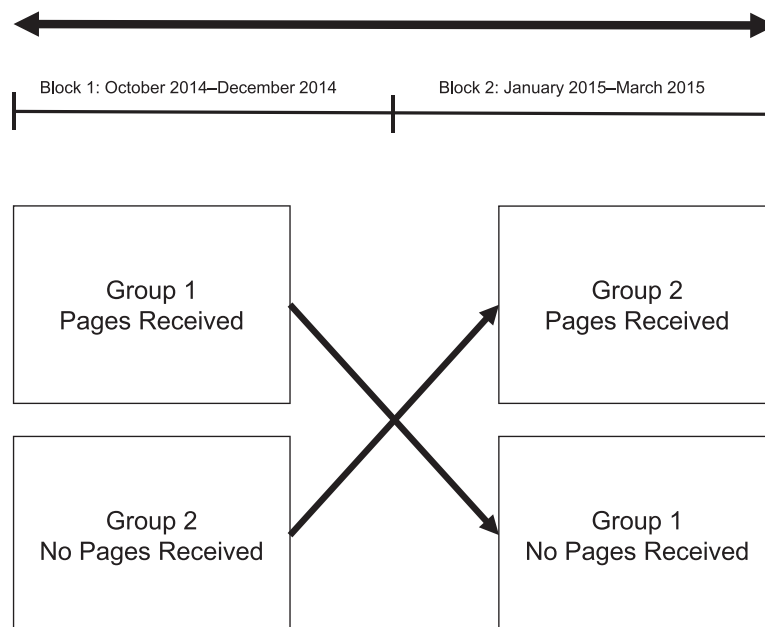


FIGURE 1
Crossover Study Design

TABLE 1
Demographics

	Group 1 Received Pages October–December, n (%)	Group 2 Received Pages January–March, n (%)
Total fellows (46)	23 (50)	23 (50)
Fellowship		
Cardiology (16)	8 (50)	8 (50)
Pulmonary (16)	7 (44)	9 (56)
Hematology-oncology (14)	8 (57)	6 (43)
Year of training		
F1 (17)	9 (53)	8 (47)
F2 (15)	7 (47)	8 (53)
F3 (14)	7 (50)	7 (50)

At the completion of the study, a survey was provided to all fellows included in the study. The survey tool was created and administered through REDCap (Research Electronic Data Capture), which is a secure, web-based application designed to support data capture for research studies (provided as online supplemental material).⁸ This survey was e-mailed to all participants and available for 1 month after study completion.

The study was approved by the Indiana University–Purdue University Indianapolis Institutional Review Board.

Statistical Analysis

Statistical analysis was performed with the statistical software, SPSS version 22 (IBM Corp, Armonk, NY). Mean attendance between groups was compared using Student *t* tests. Within each group, a subgroup analysis was performed to assess for differences within the year of training and between fellowship programs. This was performed during each 3-month block. To assess for individual trainee differences, a paired *t* test was performed comparing mean attendance for each participant while receiving pages and while receiving no pages.

Results

A total of 156 conferences were included for analysis: 75 during the first 3 months and 81 during the second

3 months. There were 84 cardiology conferences, 43 pulmonary conferences, and 29 hematology-oncology conferences. A total of 46 fellows were included in the study: 16 pulmonary, 16 cardiology, and 14 hematology-oncology (TABLE 1). All fellows in each fellowship program (100%) participated in the study. Average attendance for all participants at the selected conferences during the study period was 45%. There were no differences in overall attendance between groups 1 and 2 during either block or the entire study period (TABLE 2).

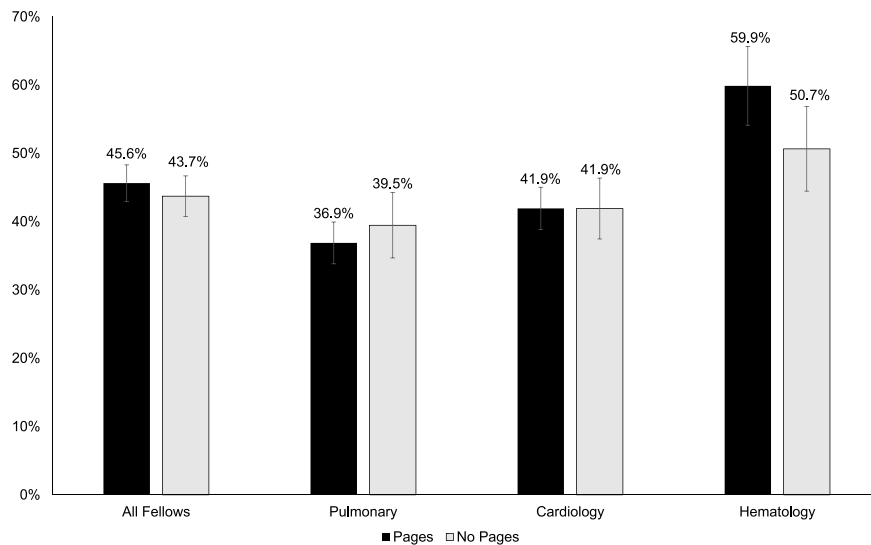
We found no differences when looking at the effect of paging reminders on overall individual attendance (43.7% versus 45.6%; *P* = .50; FIGURE 2). On subgroup analysis, we found no difference of paging reminders for individuals based on year of training or fellowship (FIGURES 2 and 3). No significant differences were identified between each fellowship or between the years of training in block 1 or block 2.

At the completion of the study, a survey was provided to all study participants with an overall response rate of 59% (27 of 46 fellows). The majority of fellows found paging reminders to be helpful prior to the conference (70%, 19 of 27; data provided as online supplement material), although almost 60% (16 of 27) of the participants felt that paging had no effect on their overall attendance, and 41% (11 of 27) reported being annoyed by reminder pages. The most common reason for absence from a conference was

TABLE 2
Comparison of Mean Attendance Between Paging Groups

	Group 1 Received Pages October–December Mean Attendance (SEM)	Group 2 Received Pages January–March Mean Attendance (SEM)	P Value
Overall attendance (October–March)	42.9% (3.6)	46.5% (3.4)	.46
Block 1 (October–December)	44.4% (3.9)	46.2% (3.7)	.75
Block 2 (January–March)	41.3% (4.7)	46.8% (3.8)	.36

Abbreviation: SEM, standard error of the mean.

**FIGURE 2**

Comparison of Mean Attendance for all Individuals and by Fellowship Program During the Study

Note: There were no statistically significant differences identified in any groups ($P > .05$).

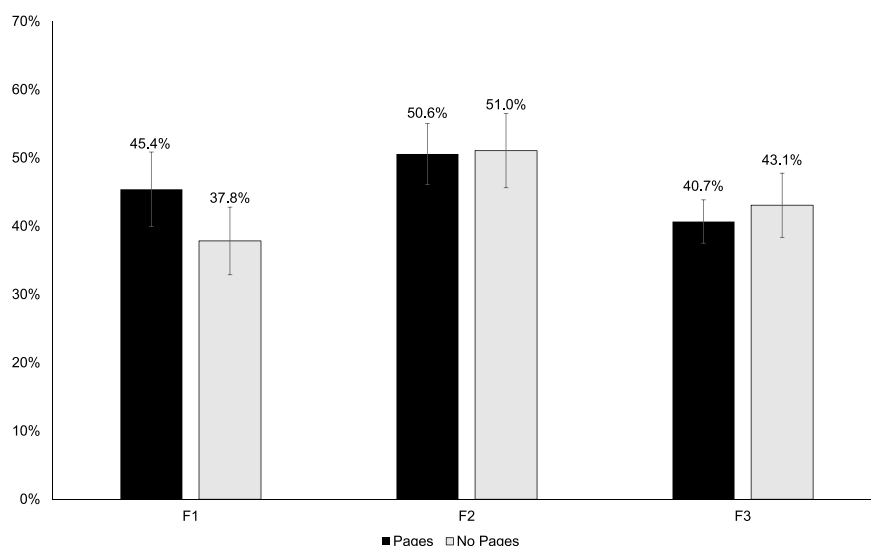
clinical responsibilities, followed by conference time and location.

Discussion

In this randomized crossover study, we found that for 3 fellowship programs at our institution, paging reminders before a regularly scheduled conference had no effect on overall attendance. To our knowledge, this is the first study to determine the effect of routine paging reminders on conference attendance. The Accreditation Council for Graduate Medical Education previously recommended that residents in

internal medicine programs attend an average of 60% of educational teaching conferences,² and published reports show average attendance rates ranging from 30% to 50%.¹⁻⁴ Prior studies have attempted to determine if conference attendance is predictive of performance on training examinations, with mixed results.¹⁻³

Reminders are popular tools utilized for adult learners. Previous studies have shown reminders to be beneficial for physicians with the implementation of clinical guidelines in preventative care.^{9,10} Reminders in electronic health record systems have also

**FIGURE 3**

Comparison of Mean Attendance for all Individuals by Year of Training

Note: There were no statistically significant differences identified within groups ($P > .05$).

been shown to be an effective tool, prompting internal medicine residents to perform routine screening in primary care clinics.¹¹ We extrapolated these data in formulating our hypothesis that similar reminders would have a beneficial effect on conference attendance. Our study, however, found no such benefit.

A possible explanation for our findings is the burnout effect of receiving multiple pages, as 41% of our fellows reported being annoyed by routine paging reminders. Interestingly, 70% of fellows believed the paging reminders were helpful, but almost 60% believed pages did not improve their conference attendance. The most common reason given for conference absence was clinical responsibilities. It is possible that fellows recognized that attendance was expected but believed clinical responsibilities superseded that expectation. Within the pulmonary division, there was disagreement as to whether paging reminders would affect attendance, and some felt fellow-level learners should not be notified with a page before a conference to mimic “real world” obligations and responsibilities.

There are limitations to this study. It was conducted within a single specialty and a limited set of subspecialties at a single institution, which may limit the ability to generalize from the findings. Our sample included only current fellows and not residency-level trainees. Fellowship trainees at our institution have more protected research time compared with internal medicine residents. We attempted to address the potential bias of trainees attending a conference when their colleague received a reminder page, but only 19% (5 of 27) of survey responders reported this occurring.

While paging reminders had no effect on conference attendance, alternative measures should be investigated to improve attendance. Such alternative measures could include implementing teleconference technology, determining the most appropriate time and location for conferences, and providing appropriate support for adult learners with conflicting clinical responsibilities.

Conclusion

This study of internal medicine fellows found that paging reminders seem to have no effect on attendance, and alternative measures may need to be undertaken to improve overall attendance. The majority of fellows reported that clinical responsibilities were a major driver of poor attendance.

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