

# Improving Nonattendance at Outpatient Pediatric Endoscopy Unit of a Tertiary Center

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## ABSTRACT

**Background and Objectives:** Failure to attend pediatric outpatient endoscopic procedures leads to inefficient use of resources, longer wait-list times, and delay in diagnoses. The causes for pediatric endoscopy nonattendance are not well studied. The aim of the study was to identify factors associated with failure to attend endoscopic procedures and to assess the value of quality improvement (QI) interventions implemented to improve pediatric endoscopy attendance.

**Methods:** This was a continuous QI project. We collected nonattendance data from November 2011 to November 2013. Information collected included procedure type, age, sex, time on the waiting list, history of previous procedures, and reason for nonattendance. The following QI interventions were implemented sequentially: an appointment reminder letter, a telephone call 1 week before procedure, and creation of an electronic medical note dedicated to endoscopy appointment. Pareto charts and statistical process control charts were used for analysis.

**Results:** From November 2011 to November 2013, we were able to decrease nonattendance from 17% to 11% ( $P=0.005$ ). No-show rate was reduced from 5% to 0.9% ( $P=0.00001$ ). There was no significant difference between attendees and nonattendees in relation to sex, age, or having a previous procedure. Longer waiting time (33 vs 26 days) was associated with increased risk for nonattendance ( $P=0.0007$ ). The most common causes for nonattendance were illness (31.5%), followed by caregiver/patients who no longer wanted the procedure (17.7%), and patients who improved (12.9%).

**Conclusions:** Applying QI methods and tools improved pediatric endoscopy attendance. Longer wait time for endoscopic procedures is associated with nonattendance. Given the increased pediatric endoscopy demand, strategies should be implemented to reduce wait time for pediatric endoscopy.

**Key Words:** endoscopy unit, nonattendance, pediatric endoscopy, quality improvement

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### What Is Known

- Pediatric endoscopy nonattendance has not been studied.
- Failure to attend pediatric outpatient endoscopic procedures leads to inefficient use of resources, financial waste, longer wait times, and delay in diagnoses.

### What Is New

- Applying QI methods decreased pediatric endoscopy nonattendance and wait time.
- Longer wait time for endoscopic procedures was associated with nonattendance.
- The most common causes for nonattendance were illness, caregiver/patients who no longer wanted the procedure, and patients who believed they improved.

Failure to attend pediatric outpatient endoscopic procedures leads to inefficient use of resources, financial waste, longer wait times, and delay in diagnoses. Because there is increased demand for pediatric endoscopic procedures and because access to endoscopy is limited, nonattendance should be kept to minimum (1). The causes for nonattendance have been investigated mainly in adult endoscopy units (2–7). Adult nonattendance rates range between 12.2% and 20% (2–4,7). Sola-vera et al (5) found that 14.5% of adult patients missed their endoscopy appointment. Adams (2) found in his study an incidence of nonattendance of 12.2%. There are, however, no data about nonattendance in pediatric endoscopy units. Reasons for nonattendance may include illness, forgetfulness, school's or parents' commitments, anxiety, and communications errors. Although patient's adherence plays an important factor, other factors such as facility-related issues, may also contribute to nonattendance. It is important to know which factors are associated with nonattendance, because this will enable us to target these factors to reduce the nonattendance rates of endoscopic procedures. The pediatric endoscopy quality improvement (QI) team at the Children's Hospital at Montefiore (CHAM) was formed in 2010 with the goal of improving pediatric endoscopy workflow and efficiency. Using QI methods, we were able to significantly improve timeliness of pediatric endoscopy and decrease delays (1). The next step was to target pediatric endoscopy nonattendance. Therefore, our primary aim was to identify factors that are associated with pediatric endoscopy nonattendance, and the

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secondary aim was to use this knowledge to improve pediatric endoscopy attendance.

## METHODS

This performance improvement study was conducted at the pediatric endoscopy unit at the CHAM, a pediatric tertiary and quaternary hospital affiliated with Albert Einstein College of Medicine located in Bronx, New York. A high percentage of procedure nonattendance was perceived by the pediatric gastroenterologists but never measured. Therefore, the initial objectives of the present study were to determine the baseline nonattendance rates of pediatric endoscopic procedures and the reasons for nonattendance. We used this information to develop improvement plans to decrease nonattendance.

### Pediatric Endoscopy Schedule Process

Patients were seen at pediatric gastroenterology clinic, and endoscopic procedures were determined to be indicated by the pediatric gastroenterologist. Either verbal or printed procedure information was given to the patient.

The physician filled an endoscopy request paper form, which included demographics, type of procedure requested, indications for the procedure, urgency, and medical history and handed it to the scheduler. The scheduler opened a folder for the patient and booked an appointment using Microsoft Outlook (Microsoft, Redmond, WA). After the physician accepted the appointment, the scheduler called the family/patient and notified them of the procedure date. Paperwork was submitted for insurance approval and to the operating room scheduler for anesthesia planning. The scheduling process usually took from a few hours to 24 hours. The endoscopy nurses called the patient 24 to 48 hours before the procedure. During the performance improvement project period, we transitioned from paper documentation to electronic medical record (EMR) 9.5 Centricity by General Electric (Little Shalfont, Buckinghamshire, UK). The scheduling process was, however, still done on paper.

The scheduler started tracking nonattendance, defined as cancellation within 24 hours, via phone calls on November 1, 2011 and captured the following data: type of nonattended procedure, age, sex, and reason for nonattendance. The scheduler sent nonattendance data monthly to the performance improvement

physician leader of this project, and the report was shared via e-mail with the performance team members and in faculty meetings.

Primary process intervention included using plan-do-study-act and the following interventions were implemented: starting in January 2011, a reminder letter was sent to the caregiver/patient before the procedure by the scheduler (instead of being given in the clinic); in April 2012, a telephone call 1 week before the procedure was made; in January 2013, an EMR scheduling note documenting communications with the family and confirmation of appointment was implemented (Fig. 1). Control and Pareto charts were used as QI tools. During the study period, the endoscopy suite was used 2.5 days a week by 7 and then 10 pediatric gastroenterologists.

We then retrospectively identified 943 patients via the endoscopy schedule who kept their outpatient procedures from November 1, 2011 to November 30, 2013 and used them as controls. The following information was recorded: type of procedure, age, sex, time between procedure request and procedure date, and history of previous procedure.

The present study was approved by the institutional review board of the Albert Einstein College of Medicine, Bronx, New York.

### Statistical Analysis

Data are presented as mean + standard deviation. Chi-square test was used to analyze differences in categorical variables. Differences in means and proportions were calculated by using a 1- or 2-tailed Student *t* test as appropriate. A *P* value <0.05 was considered statistically significant. Process and outcome measures were analyzed by using x-bar statistical process control chart.

## RESULTS

### Settings and Patient Characteristics

From November 1, 2011 to November 30, 2013, a total of 1103 pediatric patients were scheduled for outpatient endoscopic procedures. The most common scheduled procedure was esophagogastroduodenoscopy (EGD) (55%), followed by combined EGD/colonoscopy (26%) (Table 1). Of these patients, 160 nonattendees (14.5%) were identified. Of the missed appointments, 83 (52%) patients were scheduled for EGD, 47 (29%) for combined EGD/colonoscopies, and 11 (7%) for colonoscopies. Patients scheduled for EGD/colonoscopy and colonoscopy showed a trend for more nonattendance compared with all other procedures (*P*=0.07)

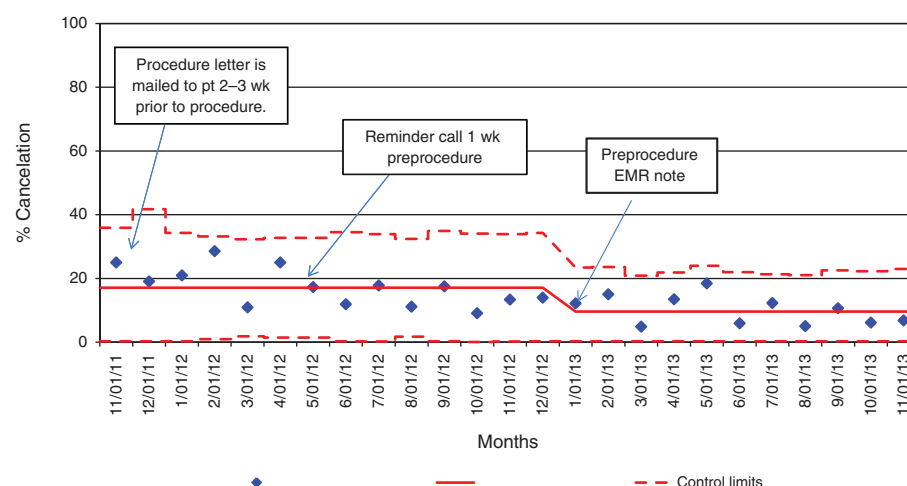


FIGURE 1. Pediatric endoscopy nonattendance from November 2011 to November 2013. EMR = electronic medical record.

TABLE 1. Factors analyzed in relation to missed pediatric endoscopic procedures

	Attendance (%) N = 943	Nonattendance (%) N = 160	Total (%) N = 1103	P
Sex				
Female	475 (50%)	68 (43%)	543 (49%)	NS
Male	468 (50%)	92 (57%)	560 (51%)	0.07
Age, y	10.7 ± 6	10 ± 6	10.4 ± 6	0.2
Waiting time, days	26 ± 17	33 ± 21	30 ± 19	0.0007
Previous procedure	269 (28.5%)	44 (27.5%)	313 (28%)	0.1
Type of procedure				
EGD	524 (56%)	83 (52%)	607 (55%)	NS
EGD/colonoscopy	239 (25%)	47 (29%)	286 (26%)	0.07
Colonoscopy	48 (5%)	11 (7%)	59 (5%)	NS
Liver biopsy	31 (7%)	4 (4%)	35 (3%)	NS
PEG placement/PEG change	68 (3%)	7 (2%)	75 (7%)	NS
Other	33 (4%)	8 (6%)	41 (4%)	NS

EGD = esophagoduodenoscopy; NS = not significant; PEG = percutaneous gastrostomy.

(Table 1). The mean age of the group was  $10.4 \pm 6$  years, and there were 560 boys (51%). There was no significant difference between the attendees and the nonattendees based on sex and age.

Twenty eight percent of patients who did not attend their endoscopic procedure had had a previous procedure; however, having a previous procedure was not associated with increased rate of nonattendance ( $P = 0.1$ ) (Table 1).

The average waiting time for patients who kept their appointment was 26 ( $\pm 17$ ) days, and for those who did not keep their appointment, it was 33 ( $\pm 21$ ) days. Longer waiting time was associated with increased risk for nonattendance ( $P = 0.0007$ ).

## Factors Affecting Nonattendance

Figure 2 shows the reasons for not keeping pediatric endoscopic appointments in 124/160 patients (in 36 patients who did not show to their endoscopy, the reason for nonattendance was not obtained). The most common causes for not attending a procedure were illness on the day before the procedure or on the day of the procedure (31.5%), caregiver/patients who no longer wanted the procedure (17.7%), and patients who believed they improved and

did not feel they needed the procedure anymore (12.9%). Of note, 2/16 (12.5%) of nonattendees who improved and 9/22 (41%) of nonattendees who no longer wanted the procedure eventually had their endoscopic procedure at a later date during the study.

## Postintervention Nonattendance

From November 2011 to December 2012, during the pre-intervention period, 591 patients had scheduled procedure appointments, and the nonattendance rate was 17%. From January 2013 to November 2013, during the postintervention period, 512 patients had scheduled procedures, and nonattendance rate was reduced to 11% ( $P = 0.005$ ) (Fig. 1). The no-show rate was reduced from 5% to 0.9% ( $P = 0.00001$ ). As a result, we were also able to reduce endoscopy wait time from an average of 27 days to an average of 24 days ( $P = 0.05$ ).

## DISCUSSION

Nonattendance of pediatric endoscopic procedures leads to waste of resources, longer wait time, and delays in diagnosis. Many of the pediatric patients who fail to attend their endoscopic

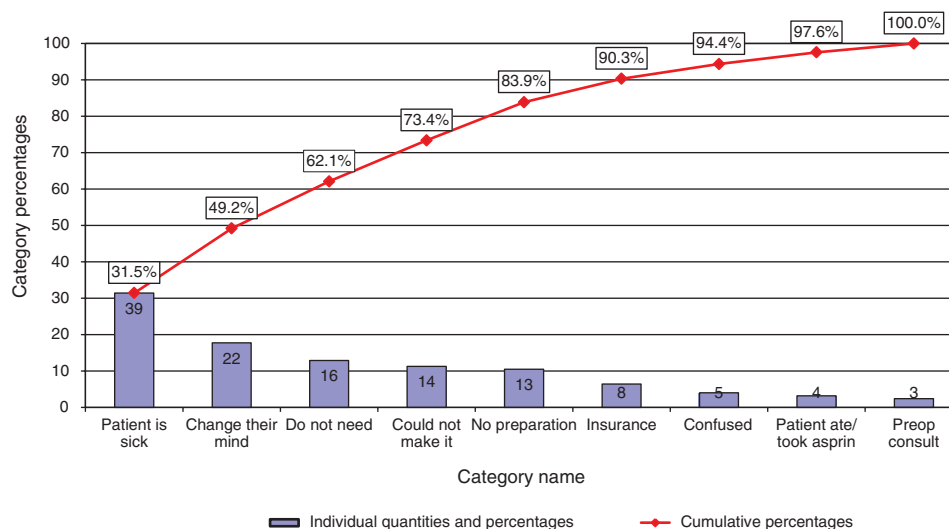


FIGURE 2. Reasons for pediatric endoscopy nonattendance within 24 hours of procedure from November 2011 to November 2013.

procedures need to be booked again for a new appointment, thereby adding to the waiting list. To our knowledge, this is the first report of improving nonattendance in a pediatric endoscopy unit using continuous QI (CQI) methods (CQI does not focus on discrete projects as it is an ongoing process of change to serve interests of patients) (8). Even in adult gastroenterology endoscopy units, there is very little information about nonattendance in the literature. Adult nonattendance rates range between 12.2% and 20% (2–4,7). Sola-vera et al (5) found that 14.5% of adult patients missed their endoscopy appointment, and Adams (2) found an incidence of nonattendance of 12.2%. Our pediatric endoscopy nonattendance rate was initially 17%. It is possible that children have more intercurrent illnesses than adults causing endoscopic procedure cancellations and that parents are fearful of the idea that their children will undergo endoscopic procedures with anesthesia, and this may result in higher nonattendance rates than in adults. By systematically and prospectively tracking patients who did not attend endoscopic procedures, identifying causes for nonattendance, and using QI intervention, we were able to significantly decrease pediatric endoscopy nonattendance rate to 11%.

In trying to identify risk factors for nonattendance, we looked at several variables. In our study, the demographics of attendees and nonattendees did not differ based on age or sex. Adams (2) found that patients who were younger were more likely to miss their appointments, whereas sex did not affect nonattendance. In contrast, Sola-vera et al (5) found no differences between attendees and nonattendees regarding age, sex, or type of examination. In our study, having a previous procedure was not associated with a risk for nonattendance of procedure; this finding is consistent with adults studies.

Understanding factors associated with nonattendance can help design strategies to reduce nonattendance rates, avoid waste, and improve endoscopic efficiency.

In a study by Gurudu et al, that investigated the reasons for patients' nonattendance of endoscopy, the investigators classified nonattendance reasons into 2 broad categories: facility-related factors and patient-related factors (3). Common facility-related nonattendance factors included scheduling errors, miscommunication, and late cancellations by referring physicians. Patient-related cancellations were caused frequently by patients who forgot their appointment, did not take the colonoscopy preparation, ate before the endoscopic procedure, had medical problems, or lacked means of transportation (2–7). In our study, the most common cause for nonattendance was illness (31.5%), followed by caregiver/patients who no longer wanted the procedure (17.7%), and patients who believed they improved and did not need the procedure anymore (12.9%). It is interesting to note the high percentage of patients who improved while waiting for the procedure. It is possible that patients may falsely perceive that they got better and will require procedure at a later date. Another possible explanation is that the physicians book procedure appointments to save a spot on the schedule in case the patient does not respond to therapy as they are aware of the long wait time.

Interestingly, Adams (2) found that the main reasons for nonattendance included the following: 66% of patients no longer wanted the procedure, 15% did not attend because of inconvenience, and 12% were prevented from attending because of personal or family illness. It is interesting to note that in our study, 12.5% of patients who improved and 41% of patients who no longer wanted the procedure eventually had an endoscopic procedure within the study period, demonstrating that they most likely falsely believed in the improvement in their condition.

Longer time on the waiting list is consistently associated with missed appointments (5). In our study, there was a significant difference in the wait time between attendees and nonattendees (33 vs 26 days, respectively,  $P = 0.0007$ ). Longer wait time may be associated with forgetfulness, insurance changes, getting the procedure done elsewhere, and patients' resolution of symptoms. Improving pediatric endoscopy attendance enabled us to decrease significantly endoscopy wait time from 27 to 24 days, even though our division grew during that time from 7 to 10 physicians, which increased the demand for endoscopy time.

Attendance can be improved by sending reminder letters and making telephone calls to patients. Indeed, success of telephone reminders has been established (3). EMR's advantages have been reported, which include timeliness, availability, completeness, legibility, and accuracy (9,10). Our study showed that EMR documentation of scheduling process further improved pediatric endoscopy attendance. This was likely because of complete and consistent documentation of the scheduling process. In order for this intervention to succeed EMR systems, however, must have updated patient information. Inability to contact patients because of incorrect phone numbers is likely to reduce efficacy of this intervention. Furthermore, these interventions require additional administrative support, which increase the cost of care.

In summary, we have reported that using CQI methods enabled us to decrease significantly pediatric nonattendance and wait time, and improve pediatric endoscopy unit efficiency. Longer wait times for endoscopy have been associated with increased risk for nonattendance, and nonattendance increases the wait time for endoscopy, creating a vicious cycle. Therefore, given the increased pediatric endoscopy demand, hospitals should implement strategies to reduce nonattendance and increase access to pediatric endoscopy.

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## REFERENCES

1. Tomer G, Choi S, Montalvo A, et al. Improving the timeliness of procedures in a pediatric endoscopy suite. *Pediatrics* 2014;133:e428–33.
2. Adams LA. Nonattendance of outpatient endoscopy. *Endoscopy* 2004;36:402–4.
3. Gurudu SR, Fry LC, Fleischer DE, et al. Factors contributing to patient nonattendance at open-access endoscopy. *Dig Dis Sci* 2006;51:1942–5.
4. Murdock A, Rodgers C, Lindsay H, et al. Why do patients not keep their appointments? Prospective study in a gastroenterology outpatient clinic. *J R Soc Med* 2002;95:284–6.
5. Sola-vera J, Sáez J, Laveda R, et al. Factors associated with nonattendance at outpatient endoscopy. *Scand J Gastroenterol* 2008;43:202–6.
6. Wardle J, Williamson S, McCaffery K, et al. Increasing attendance at colorectal cancer screening: testing the efficacy of a mailed, psychoeducational intervention in a community sample of older adults. *Health Psychol* 2003;22:99–105.
7. Lee CS, McCormick PA. Telephone reminders to reduce non-attendance rate for endoscopy. *J R Soc Med* 2003;96:547–8.
8. Baily MA, Bottrell M, Lynn J, et al. The ethics of using QI methods to improve health care quality and safety. July-August 2006/Hastings Center Report. [www.thehastingscenter.org](http://www.thehastingscenter.org). Accessed February 16, 2015.
9. Peters SG, Khan MA. Electronic health records: current and future use. *J Comp Eff Res* 2014;3:515–22.
10. Benefits of EHR. <http://healthit.gov/provider-professionals/why-adopt-ehr>. Accessed December 31, 2014.