



## Brief Report

## Reduction in pediatric gastroenterology ED visits can be sustained through physician accountability and financial incentives



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## ABSTRACT

**Objective:** There have been various interventions to reduce ED utilization. Little is known about the sustainability of outcomes of interventions to reduce ED overcrowding. We sought to investigate whether the outcomes from one of successful interventions to reduce ED utilization, specialist physician level reporting were sustained over time and how this practice change was sustained over time.

**Method:** This study is a longitudinal analysis of the pre and post intervention ED utilization data collected on ED pediatric patients who were followed by pediatric gastroenterologists in an urban, academic hospital. The primary outcome was the mean rate of ED visits per 1000 office visits from January, 2013 to June, 2017 using a u control chart with three sigma limits.

**Results:** There were continuous leadership's support, physicians' engagement and communications among different members involved in the intervention. The rate of gastrointestinal (GI)-related ED visits after an intervention decreased by 54% from 4.89 to 2.23 during all hours and by 59% from 2.19 to 0.91 during office hours.

**Discussion:** Physician-level reporting reduced ED utilization over a four year period. The outcomes could be sustained over time with sustained leadership and physicians' engagement.

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## 1. Introduction

Emergency Department (ED) overcrowding can adversely affect quality of care and costs. Various efforts to reduce ED overcrowding have been proposed over the years [1]. However, successful implementation of interventions in complex healthcare systems can be challenging. Therefore, many healthcare organizations experience high failure rate of sustained change execution [1,2]. Successful enactment of change in healthcare organizations requires persistent involvement of leadership, culture change, and physician engagement.

Engaging specialist physicians is essential to the reduction of ED utilization [3,4]. According to a recent study, more than a quarter of Emergency Department (ED) visits can potentially be managed at alternative sites such as specialists' offices [3,5]. Prior studies from our group showed that ED overcrowding was successfully decreased and related costs were saved as a result of an intervention engaging specialists in

the Department of Pediatrics at an academic, tertiary care referral hospital in a major urban city with an annual ED visit volume of over 100,000 [4,6,7]. The intervention involved the distribution of ED utilization reports of pediatric patients followed by individual specialist physicians [4,7] as well as other operational changes.

Ideally, interventions to improve quality of care in healthcare organizations should be maintained; however, there is little empirical evidence on the sustainability of change secondary to interventions [8,9]. Prior studies have focused on the outcomes of various interventions over a given time period [9], yet little is known about the persistence of those outcomes in the long run. This study aims to assess whether the outcomes from our prior interventions were sustained over time, and how this practice change was successfully sustained for the long term.

## 2. Methods

Previously described, we used pre-and post-intervention ED utilization data collected from a quality improvement project in the Division of Pediatric Gastroenterology at an academic, tertiary care

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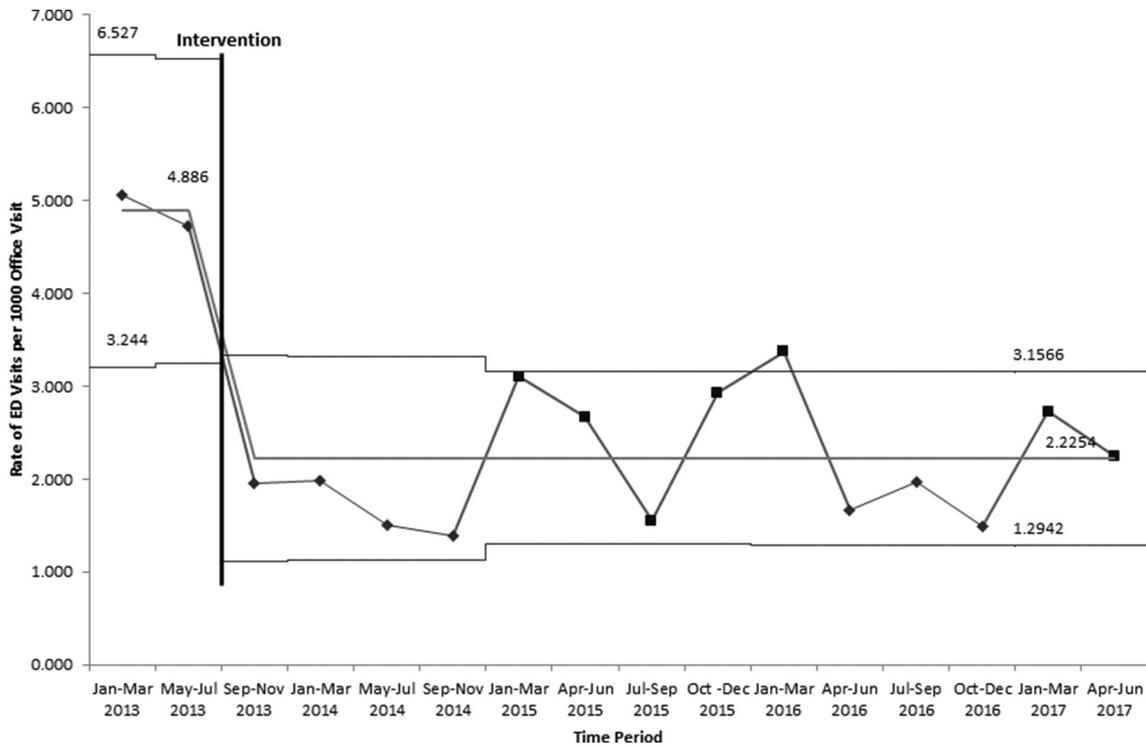


Fig. 1. Specialty-related ED visits during all hours.

referral hospital in a major urban city for the period January 2013–June 2017 [7]. The Division of Pediatric Gastroenterology includes 20 attending physicians, three nurse practitioners, three nurses and ten administrative staff with annual outpatient visits of greater than 20,000. Data on how the practice change was sustained have been prospectively collected through direct observation of meetings and communication among staff members involved in the

intervention and organizational document review throughout the study period.

Our primary intervention was to distribute physician-level reports of ED utilization rates of their patients every six months. Using financial incentives through our physician organization, we had each clinical division examine and discuss their reports as a group [10]. Additionally, each division was tasked to design an intervention to reduce ED use

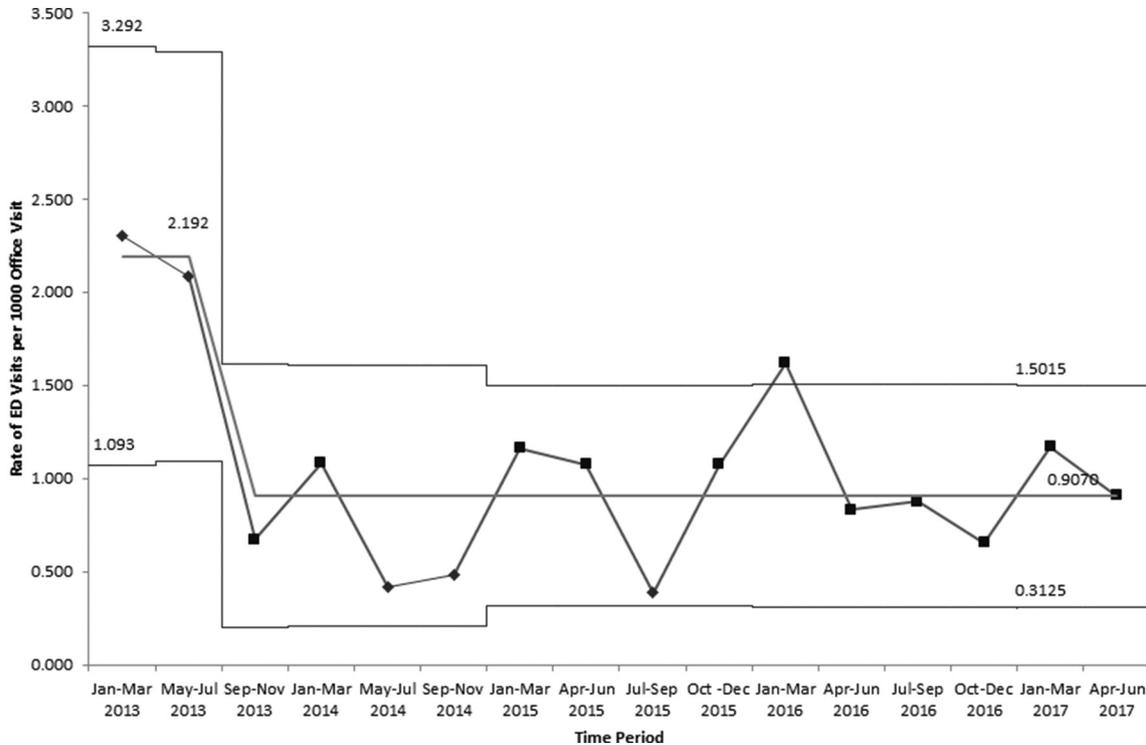


Fig. 2. Specialty-related ED visits during office hours.

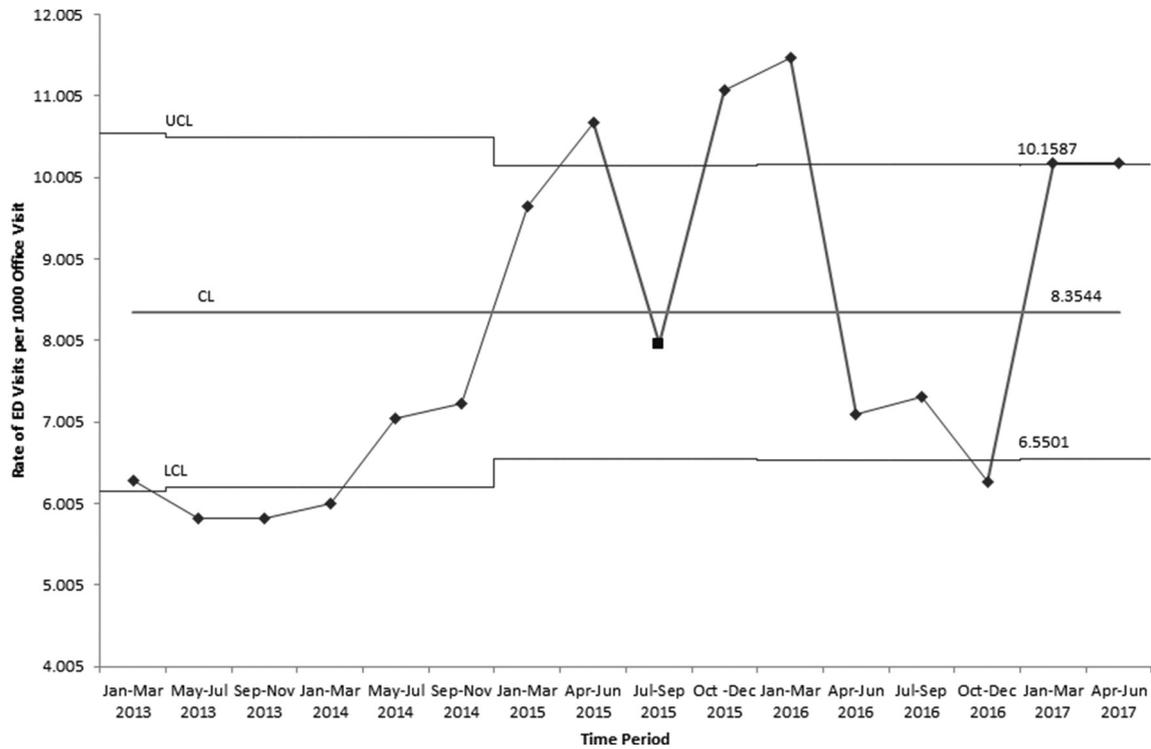


Fig. 3. All diagnosis ED visits during all hours.

based on their reports. Specifically, for the Division of Pediatric Gastroenterology they implemented a process change where urgent GI-related complaints were preferentially scheduled for an urgent office visit [4].

The outcome variable was the mean rate of ED visits per 1000 for three-month period in the Division of Pediatric Gastroenterology. To examine and compare the outcomes of intervention within the Division of Pediatric Gastroenterology, we calculated the mean rate of ED visits for each three-month period by four groups: 1) Specialty-related ED visits

during all hours, 2) Specialty-related ED visits during office hours, 3) ED visits during all hours, and 4) ED visits during office hours. We used the ED visit rates that were not specialty-related as a control as they should not be affected by our intervention. For analysis we used u control charts that show the mean rate of ED visits for three-months with the upper control limits (UCL) and the lower control limits (LCL) set at three sigma levels. We created u control charts pre-and post-August 2013, when the first physician-level reporting was created and

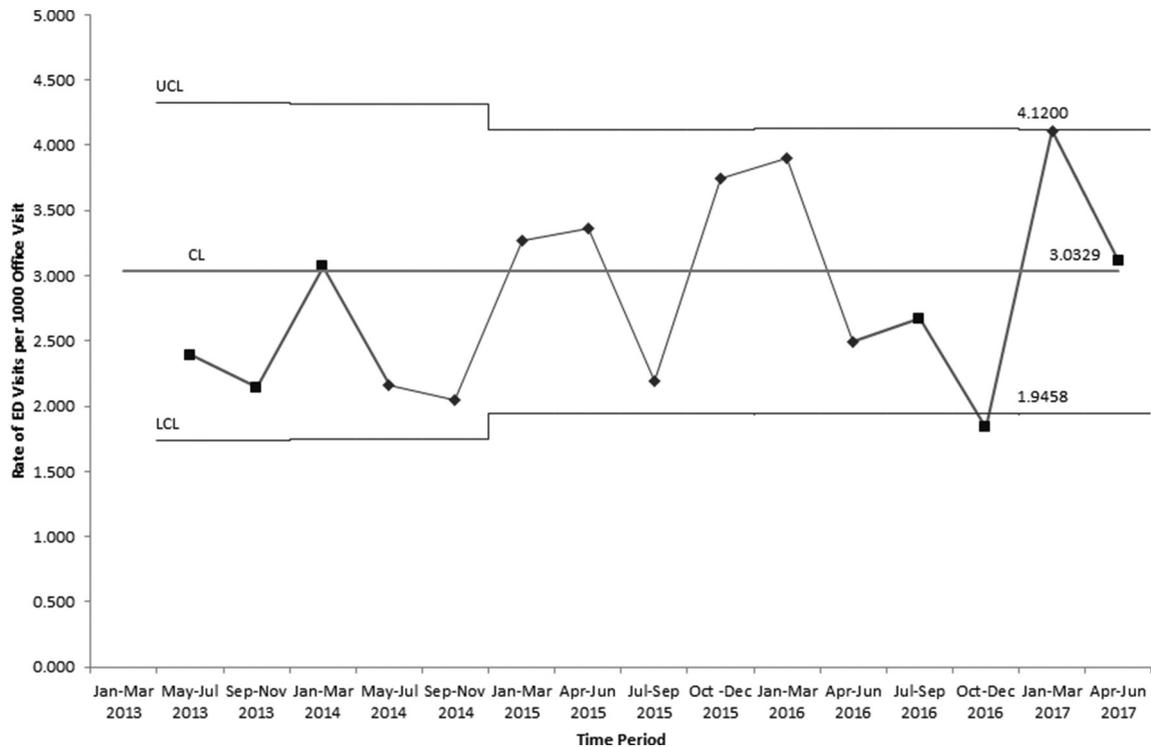


Fig. 4. All diagnosis ED visits during office hours.

distributed. Previously described, specialty-related ED visits were based on the primary discharge diagnosis from the ED and grouped based on the Clinical Classifications Software (CCS) for International Classification of Diseases (ICD), 9th Revision [4,7,11].

### 3. Results

After physician-level report intervention were implemented, the Division of Pediatric Gastroenterology reduced specialty-related ED visits and sustained the reduced rates over four years. The mean rates of specialty-related ED visits during 40 months from September 2013 to June 2017 were 2.23 (UCL: 3.16, LCL: 1.29) for all hours and 0.91 (UCL: 1.50, LCL: 0.31) during office hours (Figs. 1, 2). The Division of Pediatric Gastroenterology reduced GI-related ED visits by 54% for all hours compared to the mean rate of 4.89 (UCL: 6.53, LCL: 3.24) and by 59% compared to the mean rate of 2.19 (UCL: 3.29, LCL: 1.09) during pre-intervention period from January 2013 to June 2013 (Figs. 1, 2).

The rates of ED visits for all-diagnoses by the patients of the Division of Pediatric Gastroenterology remained unchanged pre-and post-intervention (Figs. 3, 4). The mean rates of ED visits for all-diagnoses during all hours was 8.35 (UCL: 6.55, LCL: 10.16) and that during office hours was 2.89 (UCL: 1.83, LCL: 3.95).

Throughout the intervention, monthly physician-level reporting was continuously created and distributed every six months with sustained leadership's support and involvement. The leadership continued to examine reports and modify. Individual physicians provided feedback and comments in a continuous process and reports were revised accordingly.

### 4. Discussion

The physician-level report led to the reduction of ED utilization over time. Specific to the Division of Pediatric Gastroenterology, the initial reports lead to a process change where urgent GI-related complaints were preferentially scheduled for an urgent office visit [4]. Other divisions also received their reports and each division came up with different interventions based on their unique populations. Interestingly, some of the other divisions did not implement a specific process change and the only intervention was the regular reporting of ED utilization. As previously published, this lead to decreased ED use in certain clinical divisions [7].

Regular follow-up ED use reports helped maintain this successful outcome over four years. Core to the success of this change has been the strong and continuous support of leadership at the Department, which leads to the engagement of physicians and multidisciplinary frontline staff in the division and organizational culture change. There was the sustained leadership in the division and quality improvement team and their continuous supports for this change.

Our study demonstrated that the sustained leadership, physician engagement, close collaboration across disciplines and financial incentive program [10,12] are critical factors for successful implementation and sustainability of the quality improvement. Like prior existing research [13,14], the strong and continuous involvement of a senior leadership both from the Department of Pediatrics and Division of Pediatric

Gastroenterology led to engagement of physicians and multidisciplinary frontline staff.

### 5. Conclusions

Continuous physician level reporting and leadership involvement facilitated the continuous knowledge sharing through report sharing, improved communication among leadership, physicians and frontline staff, and provided an effective double-loop feedback. It also helped different members of the organization share an institutional goal, engage in the change and improve the sustainability of the behavior changes and outcomes.

### Funding source

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