Sustainability of Ambulatory Safety Event Reporting Improvement After Intervention Discontinuation

Herbert W. Clegg, II, MD, Aaron M. West, BS, and William E. Anderson, MS

ABSTRACT

Objective: An educational intervention stressing anonymous, voluntary safety event reporting together with monthly regular audit and feedback led to significantly increased reporting of safety events in a nonacademic, community practice setting during a 15-month intervention period. We assessed whether these increased reporting rates would be sustained during the 30-month period after the intervention was discontinued.

Methods: We reviewed all patient safety events reported in our ambulatory clinics for the period 2012–2016, and selected 6 clinics that comprised the intervention collaborative and 18 specialty- and size-matched clinics (1:3 match) that comprised the comparator group. To test the changes in safety event reporting (SER) rates between the intervention and postintervention periods for the intervention collaborative, interrupted time series analysis with a control group was performed.

Results: The SER rate peaked in the first month following the start of the intervention. Following discontinuation of regular auditing and feedback, reporting rates declined abruptly and reverted to baseline by 16 months post intervention.

Conclusion: It is likely that sustaining enhanced reporting rates requires ongoing audit and feedback to maintain a focus on event reporting.

Keywords: patient safety; safety event reporting; voluntary reporting system; risk management; ambulatory clinic.

We have previously shown that patient safety reporting rates for a 6-practice collaborative group in our non-academic community clinics increased 10-fold after we implemented an improvement initiative consisting of an initial education session followed by provision of monthly audit and written and in-person feedback [1]. The intervention was implemented for 15 months, and after discontinuation of the intervention we have continued to monitor reporting rates. Our objective was to assess whether the increased reporting rates observed in this collaborative during the intervention period would be sustained for 30 months following the intervention.

Methods

This study's methods have been described in detail previously [1]. For this improvement initiative, we reviewed all patient safety events reported in our ambulatory clinics for the period 2012–2016. We identified 6 clinics, the intervention collaborative, in family medicine (n = 3), pediatrics (n = 2), and general surgery (n = 1), and 18 specialty- and size-matched clinics (1:3 match), the comparator group [1]. For the intervention collaborative only, we provided an initial 1-hour educational session on safety events with a listing of all safety event types, along with a 1-page reporting form for voluntary, anonymous submission, with use of the term "safety event" rather than " error," to support a nonpunitive culture. After the educational session, we provided monthly audit and written and in-person feedback with peer comparison data by clinic. Monthly audit

From Novant Health and Novant Health Medical Group, Winston-Salem, NC (Dr. Clegg and Mr. West), and Atrium Health, Charlotte, NC (Mr. Anderson).

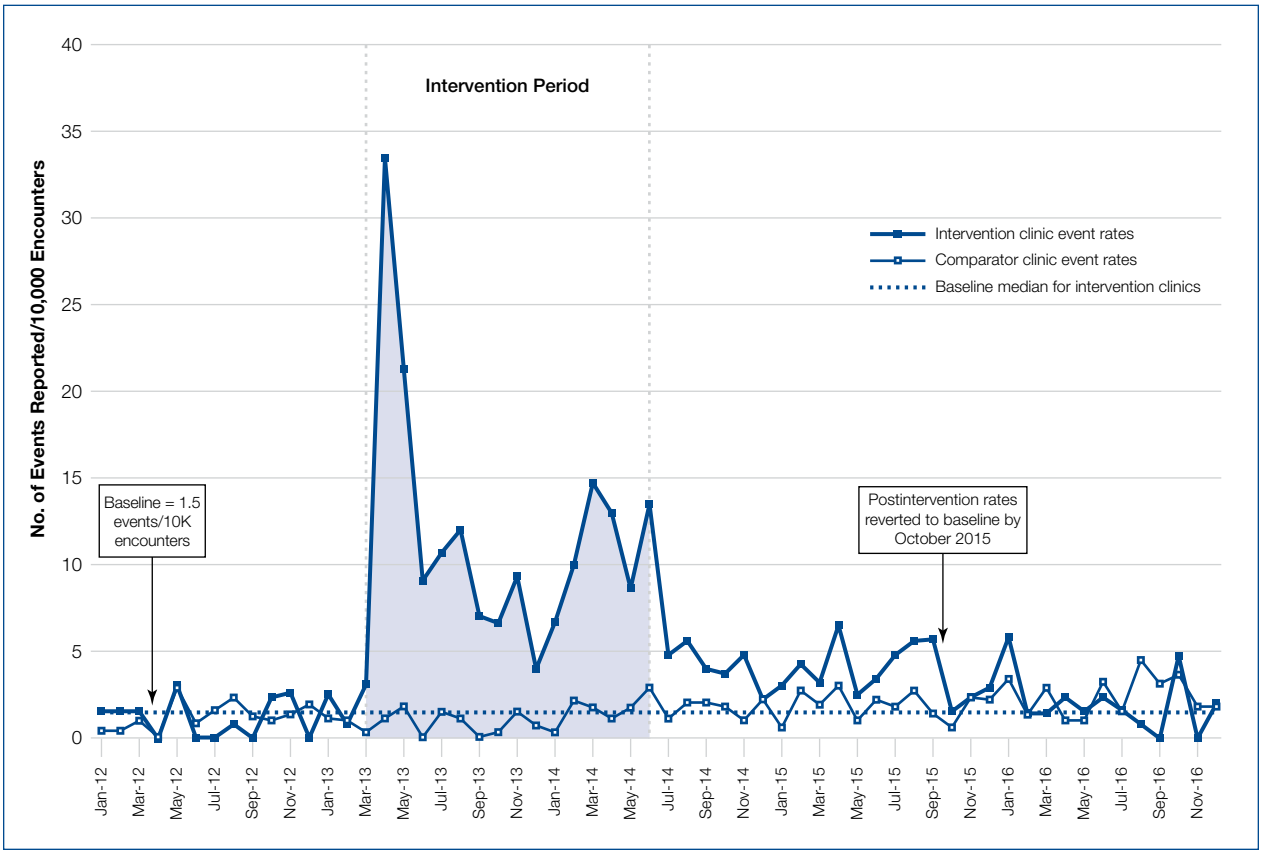

Figure. Impact of a 15-month intervention on patient safety event reporting by month (2012-2016).

and feedback continued throughout the intervention and was discontinued postintervention. For event reporting, in our inpatient and outpatient facilities we used VIncident (Verge Solutions, Mt. Pleasant, SC) for the period 2012–2015 and RL6: Risk (RL Solutions, Toronto, ON) for 2016.

The baseline period was 15 months (January 2012–March 2013), the intervention period was 15 months (April 2013–June 2014), and the postintervention period was 30 months (July 2014–December 2016). All 24 clinics were monitored for the 60-month period.

To test the changes in the rate of safety event reporting (SER) between the pre-intervention and postintervention periods and between the intervention and the postintervention periods, interrupted time series (ITS) analysis with a control group was performed using PROC AUTOREG in SAS Enterprise Guide 6.1 (SAS Institute Inc., Cary, NC). Because SER rates are reported monthly, ITS analysis was used to control for autocorrelation, nonstationary variance, seasonality, and trends [2,3].

Results

The SER rate was assessed monthly, so the number of SER rates for each group (intervention and comparator) was 15 during the pre-intervention and intervention periods, respectively, and 30 during the postintervention period. During the pre-intervention period, the intervention collaborative's baseline median rate of safety events reported was 1.5 per 10,000 patient encounters (**Figure**). Also, for the intervention collaborative, the pre-intervention baseline mean (standard deviation, SD) SER rate (per 10,000 patient encounters by month) was 1.3 (1.2), the intervention mean SER rate was 12.0 (7.3), and the postintervention rate was 3.2 (1.8). Based on the ITS analysis, there was a significant change in the SER rate between the intervention and postintervention periods for the intervention collaborative ($P = 0.01$).

The SER rate peaked in the first month following the start of the intervention. After discontinuation of feedback, reporting rates declined abruptly and reverted to

baseline by 16 months post intervention (Figure). The postintervention SER rate was also significantly higher than the pre-intervention rate ($P = 0.001$).

For the comparator clinics, no significant change in SER rates occurred for the 3 time periods.

Discussion

In this initiative with a 5-year reporting window, we had previously shown that with education and prospective audit and feedback, we could achieve a 10-fold increase in patient SER rates among a multi-practice collaborative while the intervention was maintained [1]. Even though there was a modest but significant increase in the SER rate in the postintervention period for the 6-clinic intervention collaborative compared to baseline, the substantial gains seen during the course of the intervention were not maintained when monthly audit and feedback ceased and monitoring continued for 30 months.

Limitations of this study include possible selection bias resulting from including clinics felt likely to participate rather than identifying clinics in a random fashion. In addition, we did not attempt to determine the specific reasons for the decrease in reporting among these clinics.

The few studies of ambulatory SER do not adequately address the effect of intervention cessation, but researchers who implemented other ambulatory quality improvement efforts have reported that gains often deteriorate or revert to baseline without consistent, ongoing feedback [4]. Likewise, in hospital-based residency programs, a multifaceted approach that includes feedback can increase SER rates, but it is uncertain if the success of this approach can be maintained long-term without continuing feedback of some type [5–7].

There are likely many factors influencing SER in ambulatory clinics, many of which are also applicable in the hospital setting. These include ease of reporting, knowing what events to report, confidentiality of reporting, and the belief that reporting makes a difference in enhancing patient safety [8]. A strong culture of safety in ambulatory clinics may lead to enhanced voluntary SER [9], and a nonpunitive, team-based approach has been advocated to promote reporting and improve ambulatory safety [10]. Historically, our ambulatory medical group clinics have had a strong culture of safety and, with patient safety coaches present in all of our clinics, we have supported a nonpunitive, team-based approach to SER [11].

In our intervention, we made reporting safety events easy, reporters knew which events to report, events could be reported anonymously, and reporters were rewarded, at least with data feedback, for reporting. The only factor known to have changed was discontinuation of monthly feedback. Which factors are most important could not be determined by our work, but we strongly suspect that sustaining enhanced reporting rates requires ongoing audit and feedback to maintain a focus on event reporting.

Corresponding author: Herbert Clegg, MD, 108 Providence Road, Charlotte NC, 28207, hwclegg@novanthealth.org.

Financial disclosures: None.

References

1. Clegg HW, Cardwell T, West AM, Ferrell F. Improved safety event reporting in outpatient, nonacademic practices with an anonymous, nonpunitive approach. J Clin Outcomes Manag 2015;22:66–72.
2. Newland JG, Stach LM, De Lurgio SA, et al. Impact of a prospective-audit-with-feedback antimicrobial stewardship program at a children's hospital. J Pediatric Infect Dis Soc 2012; 1:179–86.
3. Penfold RB, Zhang F. Use of interrupted time series analysis in evaluating health care quality improvements. Acad Pediatr 2013;13 (6 Suppl):S38–44.
4. Gerber JS, Prasad PA, Fiks AG, et al. Durability of benefits of an outpatient antimicrobial stewardship intervention after discontinuation of audit and feedback. JAMA 2014;312:2569–70.
5. Steen S, Jaeger C, Price L, Griffen D. Increasing patient safety event reporting in an emergency medicine residency. BMJ Qual Improv Rep 2017;6(1).
6. Fox M, Bump G, Butler G, et al. Making residents part of the safety culture: improving error reporting and reducing harms. J Patient Saf 2017. [Epub ahead of print]
7. Dunbar AE 3rd, Cupit M, Vath RJ, et al. An improvement approach to integrate teaching teams in the reporting of safety events. Pediatrics 2017;139:e20153807.
8. Institute of Medicine. To err is human: Building a safer health system. National Academies. www.nationalacademies.org/hmd/~/media/Files/Report%20Files/1999/To-Err-is-Human/To%20Err%20is%20Human%201999%20%20report%20brief.pdf Published November 1999. Accessed August 22, 2018.
9. Miller N, Bhowmik S, Ezinwa M, et al. The relationship between safety culture and voluntary event reporting in a large regional ambulatory care group. J Patient Saf 2017. [Epub ahead of print]
10. Neuspiel DR, Stubbs EH. Patient safety in ambulatory care. Pediatr Clin North Am 2012;59:1341–54.
11. West AM, Cardwell T, Clegg HW. Improving patient safety culture through patient safety coaches in the ambulatory setting. Presented at: Institute for Healthcare Improvement Annual Summit on Improving Patient Care in the Office Practice and the Community; March 2015; Dallas, Texas.