

Unscheduled Emergency Department Revisits Within 48 Hours of Discharge

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Abstract. This study aimed to analyze early revisits (within 48 hours of discharge) in an Emergency Department. Among the 178,295 visits, 11,686 were revisits, resulting in a rate of 6.55% (95%CI 6.43-6.67). A total of 1,410 revisits required hospitalization, and 252 were due to preventable errors (17.87%). These errors were mainly related to an inadequate therapeutic plan at discharge (47.22%), an incomplete diagnostic process (29.37%), and misdiagnoses (13.10%). These findings represent a technology-enabled clinical audit tool. Electronic Healthcare Records have the potential to: provide quality metrics of hospital performance, help to keep revisit rates updated (assessment through a real-time dashboard), and improve clinical management (by transparency initiatives about errors, and a supportive learning environment regarding lessons learned).

Keywords. Referral and consultation, emergency medical services, quality of health care, hospital information systems, data science, Argentina

1. Introduction

Unscheduled revisits in an Emergency Department (ED) are usually defined as a patient returning to the ED with the same problem within 72 hours of discharge [1]. Revisits represent a common phenomenon [2], as their rates vary from 2 to 7%, depending on the country and the time criteria used to define them [3]. It is known that returning visits after an index ED encounter cause an excessive burden on hospital resources and on already overcrowded EDs [4]. Concerns regarding high costs [5], ED crowding [6], and waste of resources have led to prioritizing the reduction of preventable revisits [4].

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The magnitude of revisits is unknown in our institution. This study aimed to analyze early revisits (within a 48 hours timeframe), focusing on the group of patients who required hospitalization after the revisit.

2. Method

An observational, descriptive, cross-sectional study was designed. ED visits of adult patients between July 2018 and July 2019 were included. This study was performed at Hospital Italiano de Buenos Aires, a community-based tertiary care hospital in Buenos Aires, Argentina. It has an ED that provides services for unscheduled consultations 24 hours a day, 365 days a year, and usually attends about 160,000 consultations annually. Electronic Healthcare Records (EHRs) and healthcare information are stored in a single Clinical Data Repository, allowing secondary data analysis. This study was approved by Institutional Review Board (#5447), it was conducted according to the amended declaration of Helsinki and maintained privacy and confidentiality.

Rates of early revisits (defined as those happening within 48-hours of discharge) and rates of patients having a hospital admission after the revisit are reported as prevalences with their respective 95%CI. We used STATA17 software to perform statistical analysis.

3. Results

Among 178,295 ED visits, 11,686 were unscheduled revisits, resulting in a revisit rate of 6.55% (95%CI 6.43-6.67). A total of 1,410 revisit cases resulted in hospitalization (Table 1) with an unscheduled hospitalizations rate of 12.06% (95% CI 11.48-12.67).

Table 1. Unscheduled return visit rate within 48-hours of discharge.

Month	Consultations	Revisits within 48-hours	Rate	95%CI	Return visit with admission
July 2018	14,703	959	6.52%	6.12 to 6.93	110
August 2018	16,472	1,106	6.71%	6.33 to 7.10	113
September 2018	16,915	1,097	6.48%	6.11 to 6.86	108
October 2018	15,362	972	6.32%	5.94 to 6.72	145
November 2018	14,168	906	6.39%	5.99 to 6.81	102
December 2018	13,907	1,025	7.37%	6.94 to 7.81	116
January 2019	14,053	942	6.70%	6.29 to 7.12	107
February 2019	13,261	962	7.25%	6.81 to 7.70	105
March 2019	14,507	967	6.66%	6.26 to 7.08	137
April 2019	14,651	900	6.14%	5.75 to 6.54	110
May 2019	14,661	938	6.39%	6.00 to 6.80	134
June 2019	15,635	912	5.83%	5.47 to 6.21	123
	178,295	11,686	6.55%	6.43 to 6.67	1,410

After reviewing by experts in internal medicine, we identified 252 revisits that were caused by potentially preventable medical errors, resulting in a rate of errors of 17.87% (95%CI 15.90-19.97). This rate remained stable during monthly monitoring (Figure 1).

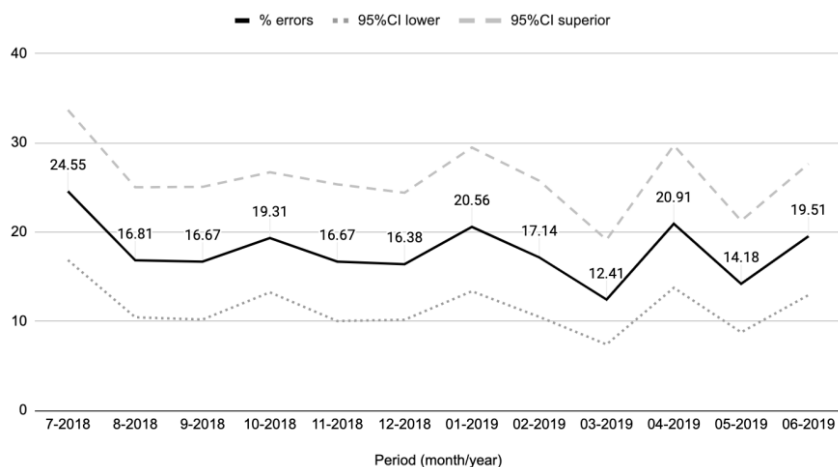


Figure 1. Rate of potentially preventable cases, by month.

The preventable errors were mainly related to an inadequate therapeutic plan at discharge (47.22%), to an incomplete diagnostic process (29.37%), and to misdiagnoses (13.10%). Table 2 depicts the characteristics of these patients. Most of them were elderly (61.5% were older than 65 years), and with a high prevalence of comorbidities (73.81% with a Charlson Score ≥ 3). During the prior month from the index ED encounter, 44.62% had a visit to ED, 19.84% had a hospitalization, and 11.11% had a surgical procedure. Many patients had the index ED consultation during the weekend (31.35%) or at the night shift (29.37%).

Table 2. Characteristics of an unscheduled ED revisit with admission within 48-hours of discharge.

n: 252	
Age, in years	
18-64	38.49% (97)
65-79	32.54% (82)
≥ 80	28.97% (73)
Hypertension	46.83% (118)
Overweight/Obesity	42.06% (106)
Dyslipidemia	32.14% (81)
Smoking status	30.95% (78)
Active cancer disease	25.00% (63)
Chronic renal disease	19.05% (48)
Immunocompromised	19.44% (49)
Diabetes	16.27% (41)
Acute myocardial infarction	11.90% (30)
Cognitive impairment	9.92% (25)
Heart failure	9.13% (23)
Liver disease	5.56% (14)
Rheumatologic disease	5.16% (13)
Multi-resistant germs	5.16% (13)
Stroke	4.76% (12)
COPD	4.37% (11)
Institutionalized	2.38% (6)

The most frequent reasons for consultation in the index encounter and ED revisit were abdominal pain (21.83% and 22.62%), fever (16.67% and 14.68%), genitourinary symptoms (16.65% and 17.06%) and dyspnea (6.65% and 9.53%). Regarding the

clinical course, 32.54% required intensive care during hospitalization, and hospital mortality resulted in 5.16% (95%CI 2.77-8.66).

4. Discussion

This manuscript is related to the centrality of digital technologies, as it presents a technology-enabled clinical audit tool. The revisit rate of 6.5% was similar to the 8.2% reported from a multistate analysis from the United States [4]. The most common causes (abdominal pain and infectious diseases) were also similar to the ones reported in the mentioned study [4].

In addition, this study presents the strategic value of insights from stored data to guide improvements in healthcare [7]. In this way, the EHRs were the key component, as they provide quality metrics to improve healthcare [8].

As a result of this research, ED changed some practices. First, a revisits indicator through the ED electronic dashboard was developed, which provides an opportunity for real-time assessment and intervention [9]. Second, transparency initiatives about errors were implemented, including a supportive learning environment (problem-based learning) and confidential discussion forums (periodical meetings with healthcare workers). These real-time metrics of hospital performance were helpful to keep revisit rates updated and to improve clinical management [10].

Regarding the limitations, this was a single-center study. Additionally, other factors (full ED, no available beds, long wait periods) could have resulted in patients being sent home and those were not explored. However, to our knowledge, this dataset is the largest currently available in our country. A new useful and accurate indicator was developed, and it was easy to understand by different members of the healthcare team (physicians, researchers, and decision-making authorities).

Even when only 18% of revisits seem to be caused by preventable errors, these findings could improve future health outcomes. Decreasing the rates of revisits will improve patients' care and will also have financial implications because fragmentation of care increases the likelihood of duplication of diagnostic studies and generates problems with care transitions. We are currently working on a Clinical Decision Support System in order to alert clinicians about revisits and to support decision-making.

As future perspectives, this work represents a foundation for the development of predictive models [11], which could early identify patients at high risk of revisiting [8]. Understanding the impact of revisits on hospital costs could be another field of study, eventually [1]. It would be also helpful to explore if equity (women or ethnic minorities) influences a poorer care experience.

5. Conclusions

This study performed a technology-enabled clinical audit of unscheduled revisits. EHRs have the potential to provide quality metrics of hospital performance, to help keep revisit rates updated, and to improve clinical management.

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