Improving Front-End Flow in an Urban Academic Medical Center Emergency Department: The Emergency Department Discharge Facilitator Team

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ABSTRACT *Length of stay (LOS) is an important determinant of patient satisfaction and overall emergency department (ED) operational efficiency. In an effort to reduce length of stay for low-acuity “treated and released” patients, our department created a discharge facilitator team (DFT) composed of an attending physician, physician assistant, and registered nurse. The DFT identified patients who could be rapidly treated and released in the low-acuity treatment Adult Urgent Care Center (AUCC) and provided them rapid treatment and discharge. To assess the efficacy of the DFT, linear regression was used to compare AUCC LOS at times the team was and was not active. Patients seen by the DFT had a LOS that was 35 % shorter than other AUCC patients. There was a 28-min reduction in AUCC LOS during periods where the DFT was active (95% CI 22 to 33 min). We conclude that the establishment of a DFT was associated with a significant reduction in LOS for all low-acuity patients. Other academic medical centers may consider implementing a similar program in order to reduce LOS and improve ED throughput for low acuity patients.*

KEYWORDS *Urban academic medical center, Front-end flow, Discharge facilitator team, Emergency department operations, Length of stay*

INTRODUCTION

Background and Importance

Emergency department (ED) visits are on the rise across the USA. According to a recent CDC survey, from 1995 to 2005, the annual number of ED visits in the USA increased by 20 %, while the number of hospital emergency departments available to treat these patients decreased by over 9 %.¹ In the 2007 National Ambulatory Medical Care Survey, 4.5 % of patients visiting the ED were triaged as needing immediate attention, 11.3 % as emergent, 38.5 % as urgent, and 29 % as semi-urgent or non-urgent (i.e., could be seen in 1–2 h or later).² There is anticipation that overall ED volumes will increase with implementation of the Patient Protection

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and Affordable Care Act, without commensurate capacity to access primary care physicians, which could exacerbate ED overcrowding even further.³

Goals of this Investigation

Our goal was to assess whether a DFT can reduce the length of stay for all patients presenting with low-acuity complaints.

MATERIALS AND METHODS

Setting and Selection of Participants

This study was conducted at an urban, academic tertiary care medical center in New York City, New York, with a total ED volume of approximately 80,000 visits and a 28 % inpatient admission rate. In 2010, approximately 60,000 patients were evaluated and treated in the adult ED, of whom approximately 29 % were triaged to the adult urgent care center (AUCC). The ED is a level-1 trauma, burn, spinal cord injury, and stroke center, and a percutaneous coronary intervention center of excellence. At the time of the study, there were 40 full-time attending physicians on staff, 6 nurse practitioners, 20 physician assistants, and emergency medicine residents enrolled in an ACGME-accredited emergency medicine residency program.

Study Design

IRB-approved, retrospective review of throughput data from low-acuity (AUCC) treated and released patients seen between June–October 2009 and June–October 2010. In 2009 the DFT had not yet been started. Between March 2010 and June 2010, there was a phased DFT implementation (trial days, education of staff, and process improvements). By June 2010, the DFT was fully functional on weekdays from 10 am to 8 pm but not in operation on weekends. Apart from the DFT, other policies and procedures remained constant during the study period.

DFT Composition

The DFT included an attending emergency physician (EP), a physician assistant (PA), and a registered nurse (RN) all stationed at the main triage area of the ED. The RN acted as a liaison with the triage personnel and identified patients with chief complaints suitable for care by the DFT. The RN also administered medications, drew bloods, and handled patient discharge procedures. The PA performed rapid assessments, patient care procedures, patient education, and disposition planning. The DFT attending physician served a dual role as both the supervising physician for the DFT and the “administrative attending” for the entire emergency department. The administrative attending role was extant prior to 2009 and required the attending to oversee the operations in all areas of the ED, respond to phone calls from outside physicians or patients, maintain the flow of patients through the ED, and assist the other attending physicians with any service issues that might arise. As head of the DFT in addition, this same attending finalized the patients' treatment plans, oversaw the quality of care, and reviewed results from diagnostics or procedures completed prior to the patient's discharge.

DFT Patients

All adult (21 years and older) patients who presented to walk-in triage (as opposed to a separate ambulance triage) were screened by the ED triage nurse and directed to

one of the following treatment areas: urgent care, main ED, or psychiatric ED. Patients were pulled from the non-psychiatric queue for treatment by the DFT based on the chief complaint. In order to assist the RN, a list of chief complaints suitable for the DFT was posted in triage. (Table 1) The DFT was active between 10 am and 8 pm Monday through Friday in 2010. DFT providers treating patients had access to the same radiology, laboratory, diagnostic tests (ECG's, etc.), and consultation services as did the providers treating patients in other areas of the ED. Patients seen by the DFT were tracked as part of an ongoing quality assurance process. Record keeping and charting practices were consistent over the study period.

Data Collection and Processing

The quality-assurance log of DFT patients was reviewed to capture patients seen by the DFT, and data on these patients, urgent care patients, and patients in the main ED were obtained from the electronic tracking system.

Data Analysis

The effect of the DFT on length of stay (LOS) was evaluated by linear regression, comparing the period when the DFT was active to the 2009 and 2010 times when it was not. In addition to this primary analysis, weekend visit data from 2010 were compared to the same data from 2009 in order to determine whether there were any temporal trends in LOS not related to the DFT. This analysis was performed by two-tailed *T* test. Data from all low-acuity treated and released patients (both DFT patients and AUCC) was included.

RESULTS

Data from 4,773 AUCC patient visits in 2010 and 4,472 patient visits in 2009 was evaluated. Fifty-six percent of the patients were female and average age was 45 years (range 21–98). The average LOS for AUCC visits was 3 h 39 min. During the hours of 10 am to 8 pm the number of patients cared for in AUCC increased by 7 % in 2010 as compared to the same 3-month pre-DFT period in 2009. Overall ED volume also increased by 7 %. Weekday and weekend volume by area is detailed in Table 2.

DFT patient average LOS was 2 h 26 min; 1 h 18 min shorter than other AUCC patients (95% CI 1 h 11 min to 1 h 27 min). By regression analysis, the LOS for all low-acuity patients (DFT plus AUCC) was 28 min shorter when the DFT was active

TABLE 1 List of patient complaints for DFT

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1. Suture removal and wound check
 2. Minor trauma that requires little more than an X-ray (walking wounded)
Ankle sprains, wrist sprains, whiplash, etc.
Tiny, minor lacerations; abrasions, bruises
 3. Minor burns
 4. Simple *non-vesicular* rash
 5. Minor sore throat, earache, Upper Respiratory Infection (without SOB)
 6. Uncomplicated cystitis (*not* vaginal discharge or requiring pelvic exam)
 7. Uncomplicated simple joint pain
Shoulder pain, knee pain, etc.
 8. Low back pain in young people who are ambulatory (not severe sciatica)
 9. Medication refill
 10. Asymptomatic uncomplicated hypertension
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compared to times when it was not active (95% CI of difference 22 to 33 min). When 2010 data were compared to 2009 data to assess for temporal trends, there was little change in weekend LOS (3 h 40 min in 2009 compared to 3 h 35 min in 2010) (95 % CI of difference -14 to 5 min) while weekday AUCC LOS was reduced (Figure 1). LOS for treated and released patients department wide remained unchanged between 2009 and 2010. Mean LOS was 5 h 43 min in 2009 and 5 h 42 min in 2010 (95 % CI difference -9 to 7 min).

DISCUSSION

As the healthcare system in the USA continues to adapt to population demands and operational constraints, many areas of hospital practice are being scrutinized with the goal of improving efficiency and decreasing LOS: bed utilization, various performance/quality indicators, and patient satisfaction. In many hospitals, the ED is the primary source of hospital inpatient admissions, and as a result, ED flow is both critical to ED operations,⁴ and also a driver of public perception of the hospital as a whole. ED length of stay has been closely linked to patient satisfaction.⁵ It has been shown that patients with non-urgent and semi-urgent complaints end up having the longest wait times and length of stay in the ED. Reducing the wait times and LOS should therefore improve ED function and public perception of the hospital in general.⁶

Several studies have shown that “team triage” or a “rapid medical evaluation” team can improve operational efficiency and ED throughput, though these are done primarily in community-based medical centers.⁷ The New York-Presbyterian Hospital-Weill Cornell Medical Center Emergency Department created a discharge facilitator team (DFT) to focus on patients with low-acuity complaints in the midst of a high-volume academic medical center. The goal of the DFT project was to improve the efficiency with which low-acuity patients were cared for and thereby reduce LOS. As derived from queuing theory,⁸ patients seen by the DFT would not have to wait for a space in the main urgent care/fast track area, wait again to be seen by another nurse–physician team, then wait a third time for diagnostics and procedures to be completed, and ultimately wait a fourth time to be discharged.

Patients who have low-acuity complaints in busy emergency departments often have to wait a long time to be evaluated and treated. Long LOS can potentially decrease patient satisfaction.⁹ We have shown that the presence of the DFT was associated with a decreased LOS for low-acuity treated and released patients. Future investigation will be focused on quantifying the financial benefit of the DFT to the ED and hospital, as well as the perceived improvement in patient satisfaction scores.

TABLE 2 Treated and released patient volume by area

Year	Weekday				Weekend				Total
	Discharge facilitator team	Adult urgent care	Main ED	Total weekday	Discharge facilitator team	Adult urgent care	Main ED	Total weekend	
2009	0 (Not active)	3,342	6,846	10,188	0 (Not active)	1,130	2,174	3,304	13,492
2010	1,055	2,487	7,572	11,096	0 (Not active)	1,249	2,148	3,397	14,493

For June—October, 10 am to 8 pm

FIGURE 1. Length of stay for all low-acuity (DFT and AUCC) patients.

We think that the use of a team structure for the DFT, similar to the team-based approach that has proved useful in our department, may also improve staff satisfaction. Further investigation is needed to assess this.

We hope that our experience will add to the literature regarding the use of physicians and mid-level providers to triage in an academic urban medical center.

LIMITATIONS

Our study suffers from several limitations. The observational/before–after design makes it possible that the trends we identified were the result of changes in the department independent of the DFT. We partially address this concern by our evaluation of weekend data when the DFT was not active, recognizing that there are other differences between weekends and weekdays. Apart from the introduction of the DFT, we are not aware of any other changes in the department that would account for a difference in LOS on weekdays but not on weekends.

Another limitation of this study is the redistribution of staff from other areas of the ED. The implementation of the DFT did not require hiring any additional staff. The role of the administrative attending was expanded to include working as part of the DFT, and the RN assigned to the DFT was previously a “floating nurse” and “additional triage nurse”. The physician assistant was reassigned to the DFT from another clinical area in the main ED without adding any additional PA hours to the staffing model. Although we felt that the structure of the DFT was particularly effective in facilitating patient throughput and decompressing overcrowding in the urgent care area, it is possible that the same redistribution of staff introduced into the urgent care area would have created similar reductions in LOS. It is important to note that this redistribution of staff did not prolong LOS for treated and released patients department wide.

Our study included data from 9,245 AUCC patients and was therefore powered to detect even very small differences in LOS, creating the risk of identifying statistically significant differences that were not clinically meaningful. We feel the

28 min, or roughly 15 % reduction in overall AUCC LOS was both clinically and administratively important.

CONCLUSION

A discharge facilitator team consisting of an attending emergency physician, a physician assistant, and a registered nurse was able to identify and treat a group of patients who could be rapidly managed and discharged. The establishment of a DFT was associated with a significant reduction in LOS for all low-acuity patients despite an increasing patient volume. Other academic medical centers may consider implementing a similar program in order to reduce LOS and improve ED throughput.

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