

ORIGINAL ARTICLE

Impact of a Triage program on left without being seen rates and cost

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ABSTRACT

Objective: Emergency Departments (EDs) experience throughput constraints for various reasons, such as space, resources, staffing, and bed placement. These throughput constraints are known to increase the volume of patients who leave without being evaluated. TeleTriage is a method implemented shortly after the arrival of the patient to the ED, as a means to expedite evaluation of patients. The project aimed to implement a TeleTriage program and analyze any impact on Left Without Being Seen (LWBS) rates and cost.

Methods: A TeleTriage program was developed within a large, nonprofit, academic health care delivery system. The program was piloted at several campuses and subsequently implemented at multiple sites within the health system. Data on LWBS rates were collected for patients evaluated by the TeleTriage process and those who were not. An analysis of staffing utilization and cost-savings was also performed.

Results: The TeleTriage program resulted in an average LWBS rate of 0.12% post-implementation, versus 0.79% for patients who were not in the TeleTriage group. In addition, the staffing consolidation resulted in cost-savings.

Conclusions: The use of a TeleTriage program results in decreased LWBS rates, as well as cost-savings.

Key Words: Telehealth, Patient safety, Triage, Operations, Quality, Administration, Overcrowding, Efficiency

1. INTRODUCTION

Emergency Department (ED) crowding, often due to throughput and capacity constraints, impacts the majority of US hospitals.^[1] Crowding results in patient care delays, such as time to antibiotics, and increased mortality in the critically ill.^[1] ED overcrowding is known to increase Left Without Being Seen (LWBS) rates and decrease patient satisfaction.^[2] In one study by Rowe et al., LWBS patients were analyzed for acuity, reasons, and outcomes. Sixty percent of the 498 emergency department patients who LWBS sought medical attention within one week.^[3] Fourteen of those patients were

hospitalized and one required emergent surgery.^[3] One of those patients who did not seek subsequent medical attention died six days after ED registration.^[3] The most common reason patients LWBS in this study was excessive wait times,^[3] and higher acuity patients who LWBS were at risk for adverse outcomes. One solution to address this prevalent ED issue is TeleTriage.

TeleTriage is the process of screening patients remotely to determine the patient's acuity and level of care needed.^[4] Implementing such technology is a complex process, requiring coordination at the provider, patient, and system levels.^[5]

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TeleTriage is traditionally deployed in busy EDs with long wait times or across multiple EDs in a system.^[6] In addition to addressing overcrowding in the ED, TeleTriage can reduce wait times by initiating patient workups, as well as support facilities such as nursing homes and home health agencies to help decide if a patient requires emergency services.^[4]

More recently, the COVID-19 pandemic has prompted increasing use of tele-health, in an effort to minimize exposure to health care providers.^[7] TeleTriage has allowed staff on quarantine during the pandemic to continue working, providing less of a strain on staffing requirements.^[7] During the pandemic, the US government promoted the use of tele-health when safe, by relaxing federal and state regulations.^[7]

Our study aimed to evaluate a TeleTriage program’s impact on LWBS rates and cost effectiveness.

2. METHODS

The TeleTriage project took place in the Gulf South’s largest non-profit, academic, multi-specialty, healthcare delivery system, with over 40 owned or managed hospitals and more than 100 health and urgent care centers. Leveraging the robust clinical and technological resources that a large health system and its many EDs provide, a TeleTriage workgroup was created, which included emergency medicine and electronic health record (EHR) information systems specialists. The workgroup developed the TeleTriage dashboard and documentation template in the EHR, customizable data reports, and standardized workflows. The project began in 2019 and was accelerated with the beginning of the COVID-19 pandemic.

Once the technical workflows, on-site logistics, and stakeholder buy-in was obtained, a pilot was launched across ten sites, including the largest academic teaching facility, six mid-size community hospitals, and three free-standing emergency departments. The pilot began on April 13, 2020. The pilot sites were geographically centered and allowed the workgroup to be present to troubleshoot in real-time. The project is now in use at 11 total sites in the health system and is being implemented at multiple additional facilities.

The TeleTriage program initiates necessary patient workups earlier in the patient’s ED visit by implementing a “provider in triage” model, via a remote physician or advanced practice provider (APP). Three provider bunkers were installed across the system to allow for remote TeleTriage coverage. TeleTriage tablets were provided to the bunkers and triage areas. The triage nurse who is on site identifies patients appropriate for TeleTriage. At the start of the pilot, all ESI Level 2 patients waiting for an ED bed were placed in the TeleTriage workflow. The criteria were subsequently expanded to all

patients waiting on a room assignment. However, with the inability at the time of the pilot to discharge patients using TeleTriage alone, we concluded that ESI Level 5 patients were unavailing. Currently, the criteria include all ESI Level 2, Level 3, and Level 4 patients requiring assessment and management who are awaiting evaluation. Patients who require no work-up or only minor procedures are excluded. The triage nurse flags the patient for the TeleTriage workflow in the EHR, allowing the remote APP to be notified of a patient waiting for evaluation. Once both tablets are connected, the TeleTriage provider evaluates patients virtually in triage. Once the evaluation is complete, the provider orders necessary labs, medications, and/or imaging studies to initiate patient workups. If a critically ill or injured patient is identified during the TeleTriage process, the provider quickly notifies the on-site team at the respective facility. The provider also documents a TeleTriage note on every patient, visible in the EHR, as a form of handoff. The process is reproducible, can be accomplished in under 5 minutes, and provides a touch point that has anecdotally changed the trajectory for many patients’ care.

Utilizing available data analytics tools, dashboards were designed to track and trend TeleTriage metrics, including LWBS. Monthly TeleTriage meetings are held to review prior month’s data, discuss utilization, updates to the program, and to obtain feedback. This allows for appropriate staffing decisions and the ability to provide feedback to TeleTriage providers and site leaders on performance and utilization.

Table 1. Average LWBS% for one year prior to implementation of TeleTriage

Mon-YR	Pre-Implementation
Mar-19	0.70%
Apr-19	0.60%
May-19	0.70%
Jun-19	0.70%
Jul-19	0.70%
Aug-19	1.00%
Sep-19	1.20%
Oct-19	1.00%
Nov-19	1.10%
Dec-19	0.80%
Jan-20	0.60%
Feb-20	0.70%
Mar-20	1.40%
Average	0.83%

3. RESULTS

From March 2019 to March 2020, prior to the TeleTriage pilot, the average LWBS percentage was 0.83% (see Table 1). The pilot began in April 2020. Data was collected for 12 months after the implementation of the pilot, until March 2021 (see Figure 1). The average LWBS percentage for patients in the non-TeleTriage group was 0.79%. Patients in the TeleTriage workflow had an average LWBS percentage of 0.12%. The post-implementation groups were compared using a paired *t*-test. Significance was set, by convention, at

$p < .05$. The average number of patients who LWBS was significantly decreased ($p < .0001$) in the TeleTriage group.

Additionally, across the pilot sites, the schedule change resulted in cost savings. The project reduced onsite APP coverage by approximately 40 hours per day at 5 pilot sites, resulting in an annual cost savings of approximately \$880,000. The addition of 16 hours per day of APP TeleTriage coverage cost \$352,000. The schedule changes translated to an annual net savings of approximately \$528,000.

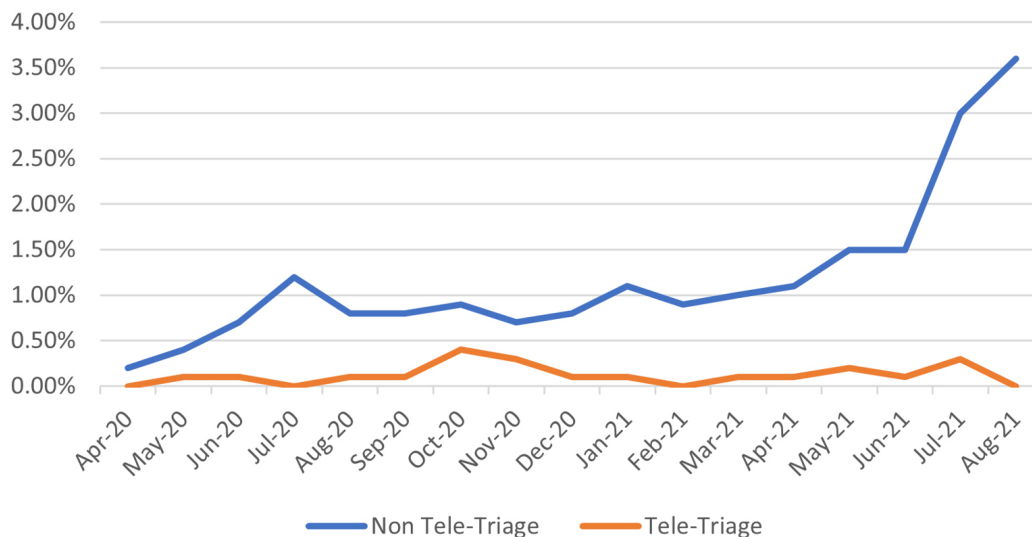


Figure 1. Impact of TeleTriage on LWBS%

4. DISCUSSION

The TeleTriage process decreases our LWBS rates. This decreased LWBS improves patient safety and aids in the mitigation of medicolegal risks posed to the organization. It is also increasingly needed as ED crowding, as Kelen et al. describe, is the persistent norm, and, in turn, ED crowding leads to increased LWBS.^[8]

Centralizing providers in a TeleTriage bunker also brought cost savings to our Emergency Medicine Service Line. As additional sites started to use the TeleTriage process, additional coverage was added. The centralized TeleTriage process could initiate workups at multiple sites during times of lower volume (e.g., late evening hours) when it would have been more costly for each site to individually increase provider coverage to evaluate and initiate workups on patients in the triage area or waiting room. The resultant TeleTriage cost per visit was approximately \$8 per hour per facility.

Our study had several limitations. TeleTriage provider capacity can sometimes be overwhelmed. The pilot began by asking the triage nurses to utilize TeleTriage as much as

possible. However, when the triage nurse marks every patient in the waiting room for the TeleTriage flow, the APP could reach capacity. The workflow had to be revised to identify patients appropriate for TeleTriage, excluding patients who would require minimal, if any, work-up, or only a minor procedure. Furthermore, as the COVID-19 pandemic continues, the data may be influenced by staffing shortages and unpredictable volume changes. Of note, an increase in LWBS rate occurred in the summer and early fall months of 2020. The increase may have been secondary to an increase in COVID-19 cases around July 2020. The increase may also be related to seasonal variation, as 2019 demonstrated similar trends around these months (see Table 1). Lastly, TeleTriage providers are unable to discharge patients whose workups are completed or require no additional testing. However, options are currently being explored for future capabilities.

5. CONCLUSIONS

A TeleTriage program was successfully implemented at several campuses in our large non-profit, academic, multi-specialty healthcare system. The program resulted in a statis-

tically significant difference in average LWBS of 0.12% in the TeleTriage group, versus 0.79% for the non-TeleTriage group. We also appreciated a cost-savings of approximately \$528,000/year by leveraging remote TeleTriage coverage at multiple facilities, while reducing on-site APP coverage.

BIO STATEMENT

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CONFLICTS OF INTEREST DISCLOSURE

The authors declare they have no conflicts of interest.

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