

CLINICAL PRACTICE

Reducing “Left without being seen” in a community emergency department: A rapid-cycle change project

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ABSTRACT

Background and objective: The COVID-19 pandemic in 2020 increased the volume of patients seeking care in the Emergency Department (ED) for a respiratory crisis. Our community hospital experienced a filling of inpatient beds, leading to an overflow of admitted patients in the ED, where adequate staff (nurses, physicians, radiology, and laboratory staff), equipment, and rooms or places for patients were lacking. Times to obtain procedures that included cardiology, laboratory, and radiology performed and resulted significantly increased. Left without being seen (LWBS) is a challenge faced by EDs across the United States (US) and has become more prevalent since the COVID-19 pandemic. Best practice suggests an LWBS rate of less than 2%, but our hospital experienced an increasing rate of hitting over 5% in January 2021. To reduce this rate, we implemented multiple rapid-cycle Plan-Do-Check-Act (PDCA) change interventions in triage and throughout the ED.

Implementation/Methods: We implemented several rapid - cycle change interventions with a high-level action plan. These actions included hiring medical/surgical nurses to care for admitted patients awaiting beds, adding additional medical providers, implementing greeters, creating specialty chairs inside a major hospital thoroughfare, opening a 12-bed Admit Care Unit (ACU) adjacent to the ED, and more.

Results: The rate of LWBS decreased from a high of 5.3% in January 2021 to 1.09% in January 2022.

Conclusion/Implications to Practice: Patients in the ED recorded as LWBS are at higher risk for safety and quality transgressions. We continue to work toward excellent patient care by continuing to implement rapid-cycle changes in response to barriers as they arise. More research is needed to expand and rethink the process of ED throughput during pandemics and emergent national crises.

Key Words: Emergency Department, Left without being seen, Plan-Do-Check-Act

1. INTRODUCTION

1.1 Background

Left without being seen (LWBS) is a challenge faced by EDs across the US and in other countries since early 2000.^[1,2] A patient who leaves the ED without a medical screening by a qualified medical professional is identified as having LWBS. The percentage of patients that LWBS is considered a quality

performance metric that reflects a shortage in health care access because patients who seek care cannot be accommodated by the ED.^[3,4] These patients usually have low-acuity complaints that have resolved or will resolve without medical care,^[5] but there is a safety risk to patients who leave after being triaged but before seeing a qualified medical professional.^[6] Another factor in ED overcrowding is the use of the

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ED by patients as a primary care provider for minor medical issues like flu-like symptoms, urinary tract infections, missed dialysis, or a need for return-to-work or sick-leave forms.^[7] Retrospective studies assessing LWBS mostly use traditional measures defined as when a care provider recognizes the patient is no longer present in the ED.^[4] Other investigators have assessed LWBS by using a timestamp indicating when the patient last had contact with a care provider.^[8]

Best practice suggests that the LWBS rate be less than 2%, but starting in the summer of 2020 during the COVID-19 pandemic, our community hospital ED experienced a rate of greater than 5%.^[9] Patient volume increased exponentially during the pandemic as the Delta variant surged, overtaking an already limited number of available beds. Since March 2020, emergency visits to our community hospital were 3 times the number just 18 months previously (see Appendix A). The COVID-19 pandemic affected ED volume, the way triage occurred, and increased patient wait times not only for our community hospital but on a national and global scale as well.

The Centers for Medicare and Medicaid Services examine rates of LWBS because of the impact on patient safety and use these rates to determine payment in the Hospital Outpatient Quality Reporting Program.^[3] Such oversight by a government agency can highlight potential areas for improvement through measures for length of stay (LOS), expected wait times, and priority. Long wait times in the ED are associated with higher mortality, longer lengths of stay, and a decrease in patient satisfaction.^[10] Many indicators affect LWBS numbers, especially during the COVID-19 pandemic, such as the ED census, hospital census (inpatient beds), ED boarder patients (patients admitted without inpatient bed placement), average physician and nurse workload, lack of equipment, lack of physical space, and higher classification of patient acuity at triage.^[1,7]

Another factor affecting LWBS is the Emergency Medical Treatment and Labor Act (EMTALA) of 1986, which entitles the community to a Medical Screening Examination (MSE) by a qualified medical professional when presenting to an ED.^[11] By definition, a screening includes stabilization, treatment, and diagnosis for emergency medical conditions. This medical screening requirement can substantially affect wait times and increase the risk for LWBS. Typically, high-acuity patients are seen in ED rooms before lower-acuity patients, resulting in low-acuity patients being at higher risk for LWBS.^[11] Before the COVID-19 pandemic, EDs and hospitals focused on improving the quality of care, increasing efficiency, and providing better throughput from the ED to inpatient beds or discharge.^[12] Throughput, or patient

flow, refers to internal systems, resources, and movement of patients from the ED to a patient bed while maintaining quality and patient satisfaction.^[13] Emergency departments are considered ambulatory services in that patients enter the ED and are treated and released to home or admitted for observation or inpatient status.^[9] Patient flow is identified with patient wait times, LOS, capacity, and door-to-doctor evaluation times.^[14]

1.2 Relevance or significance

During the COVID-19 patient surge, it was discovered that the ED triage Registered Nurses (RNs) were not able to meet the demands of their responsibilities. The pre-COVID-19 triage process relied on one triage RN to perform the following job roles and responsibilities: greet and direct visitors, greet and assist patients with the completion of ED triage demographic forms, enter patients into the Electronic Medical Record (EMR) system, obtain vital signs, assign an acuity level using an evidence-based practice triage tool such as the Emergency Severity Index (ESI),^[15] complete initial work-ups (blood draws, electrocardiography, etc.), transport patients to restrooms and/or to an empty ED room in the back when available, and discharge patients from the triage waiting room if appropriate.

After the onset of COVID-19, all hospital EDs were inundated with patients experiencing respiratory system issues, whose condition could rapidly decline to require ventilation. This led to a domino effect increasing the need for critical care beds, which is not the primary type of bed within a hospital.^[16] Critical care beds typically represent only 10% of hospital beds. Therefore, during the first wave of the pandemic, the ED experienced a large backup of patients requiring high-flow nasal cannula (Vapotherm), BiPap, and mechanical ventilation.

1.3 Purpose of project

Since the outbreak of COVID-19, our hospital experienced an increase in patient volume and admitted patients awaiting beds that created a bottleneck in the ED, thus preventing effective throughput of patients to inpatient beds. Throughout 2020, the LWBS rates escalated continuing into January 2021 for an all-time high of 5.3% (see Appendix C). Higher rates of LWBS can lead to safety concerns and lower patient satisfaction. To reduce this rate, a series of rapid-cycle change interventions were implemented during the patient triage process in the ED waiting room, along with other change interventions which are recognized as best practices.^[17]

1.4 Problem statement

The increase in the hospital's rate of LWBS to a high of 5.3% in January 2021, compared with the current LWBS goal of

less than 2%, resulted in safety concerns because patients were not receiving the care needed (see Appendix B & C).

2. RAPID-CYCLE CHANGE INTERVENTIONS

Rapid-Cycle Change interventions refer to a specific framework which utilized Deming’s Plan-Do-Check-Act (PDCA) design,^[18] (see Figure 1). The reason we chose the PDCA method was it was easy to understand and allowed for the ability to rapidly make changes and see results. Deming’s first cycle starts with the Plan step which identifies a goal and metrics to measure success. Our goal was to decrease our LWBS rate below 2% and we would measure our door-to-doctor/arrival-to-provider times, patient satisfaction, the total number of patients boarding along with total time patients were boarding in the ED as these were some key factors that were attributed to higher LWBS rates. The second step is Do. This is where the action happens. We pulled together an interdisciplinary team made of nursing leadership, physician leadership, hospital administrators, supply chain, facilities, and bedside staff to put our interventions into action. These interventions included maximizing every square inch of real estate within the hospital, adding a Provider in Triage (PIT), and increasing nursing staff. The third step is to Check or reassess. This step is important to determine if the interventions were effective. Some barriers that contributed to our interventions were people dependent. For example, we created a patient care area in a hallway adjacent to our ED lobby. Some staff did not see the benefit of this area and/or we flat-out did not have the staff to open it. By not being able to utilize the hallway space, our interventions were left undone. In the final step, Act closes the cycle by considering learning from the series, then adjusting goals, processes, and changing methods. These steps repeated are part of a continuous improvement process.

Deming’s model of PDCA focuses on checking to determine effectiveness than on considering best practices from literature. COVID-19 brought unprecedented change, so there was

little literature in the US to support best practices, therefore best practices were considered later in this project.



Figure 1. Deming Plan-Do-Check-Act diagram

The objectives of the project were multifocal:

- Evaluate changes in ED patient volume to identify capacity needs and quick-change interventions to improve patient flow and satisfaction.
- Select key performance indicators to determine the progress of the project.
- Understand the drivers of LWBS to initiate rapid-cycle PDCA change interventions to meet the current COVID-19 demands.
- Identify opportunities to improve patient throughput, patient safety, and patient satisfaction.

In May 2020, our ED and hospital were inundated with patients due to COVID-19. Our ED could not handle the volume, which was similar to other EDs throughout the nation. The first rapid-cycle intervention PDCA was to place a greeter at the ambulatory triage entrance door. The greeter was instrumental in many aspects. They assisted patients that were checking in to the ED, assisted in directing patient flow to the triage nurse; ensured all patients had masks on; rounded in the lobby to check on patients waiting, passed out blankets to those that were cold, and provided a warm welcome when entering the ED. Implementation of multifocal interventions in chronological order can be seen in Figure 2.

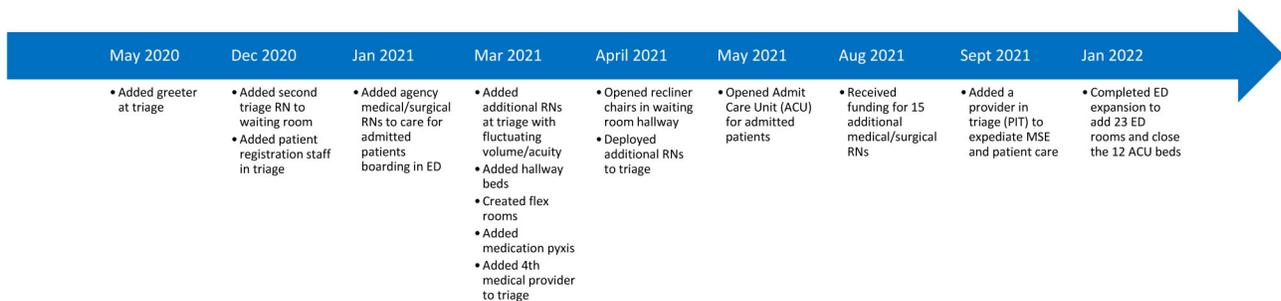


Figure 2. Left Without Being Seen Project timeline

In December 2020, another rapid-cycle intervention that further addressed the excessive responsibilities of the triage RN entailed adding a second triage RN in the waiting room. The second triage RN accommodated the surge of patient arrivals, by assessing patients and providing treatments such as initiating intravenous access, performing electrocardiography, and administering life-saving medications, just to name a few. These nurse-provided treatment modalities could be initiated more quickly, allowing for faster disposition of patients for admission or discharge. A blood drawing station was added adjacent to the triage desk to accommodate additional staff during patient volume surges. Sections of the triage waiting room were bi-furcated to safely accommodate the COVID-19 patient population.

Patient registration staff was added at the triage desk where originally the ED RN was responsible for both clinical and clerical data entry responsibilities. The ED Director worked closely with the patient registration staff to add resources to off-load the clerical data entry. This ensured that the ED triage RN was available to practice at the top of their license and provide lifesaving interventions and document imperative clinical data. With continuous feedback from the triage staff and to further improve the triage processes, the ED leadership team and the patient registration staff collaborated and shuffled their staff to be located in closer proximity to each other. This strategic move offset the non-nursing clerical duty of entering patients into the EMR from the triage RN to the appropriate patient registration staff.

In January 2021, hospital administration approved agency RNs into the ED budget. The ED Director requested that the agency RNs be medical/surgical RNs to care for the excessive number of boarded patients awaiting inpatient bed placement. The additional resources helped tremendously and ensured that we could continue to staff the second RN in triage for ED patients.

In March 2021, as all agency RNs were onboarded and acclimated, we were able to add even more RNs in triage to assist with the increasing volume and acuity. We were able to add a medication pyxis to our triage area. This allowed our nurses to stay in the lobby with the ED patients and administer medications even faster. The physician schedule was restructured by changing the arrival times of medical providers and adding a fourth provider during times when the ED experienced peak volumes. The desired outcome of adding a provider in triage was to reduce the door-to-doctor/arrival-to-provider time with a MSE, improve quality and patient satisfaction, and decrease the number of LWBS patients. In addition, hallway beds were created to increase the number of patients that could be treated in the ED and to

help decrease the wait time from the time the patient arrived in the ED to the time the patient was medically cared for. This required the acquisition of rental beds, rental monitors, and an increase in supplies and equipment. The patient flow processes were redesigned, and additional treatment spaces were created. The ED Director worked with the EMR specialist to customize the EDs blueprint within the EMR. This customization ensured and reflected the correct location of each patient, therefore, ensuring optimal communication, organization, and patient safety in an inundated ED.

In April 2021, an additional eight specialty chairs were added to the main hallway connecting the ED to the main lobby at the hospital entrance for quick treatments or interventions. This area was equipped with portable oxygen, additional rented portable monitors, partitions for privacy, and pertinent medical supplies and equipment based upon patient condition. The ability to open and operationalize this space was made possible because of the addition of the medical-surgical agency nurses.

In May 2021, an ACU was funded by hospital administration and temporarily built out in the Radiology Department (RD) which added 12 additional medical/surgical hold beds. The goal of opening the ACU was to move admitted patients who were waiting for an inpatient or observation room in the hospital out of the ED lobby and ED hallways, which ultimately opened the ED beds for ED patients to be cared for in an ED room. The opening of the 12-beds did alleviate some strain on the ED allowing for an increase in hospital throughput.

In August 2021, the ED received funding for additional agency RNs. Just as before, the ED Director requested medical/surgical RNs work within the ED to care for the abundance of boarded patients awaiting beds.

In September 2021, the provider schedule was reviewed again to ensure maximum coverage and establish a PIT. The PIT was instrumental in expediting the MSE and patient care.^[19] Finally, in January 2022, the ED construction was completed to add 23 ED rooms and thus closed the 12 ACU beds.

2.1 Rapid-cycle interventions to address patient throughput

During the peak of the COVID-19 pandemic, the hospital decided to halt elective operative cases to help accommodate the ever-growing ED patient volumes and an overall increase in hospital admissions. To accommodate the large COVID-19 surge of patients, the hospital acted swiftly and shuffled their Operating Room (OR), and office staff back to the bedside or placed them in areas with critical patient care demands. To ensure that patients waiting for care were

promptly evaluated by a medical provider, hallway areas were used for triage, and “flex” rooms were created. Four small treatment rooms within triage were established as flex rooms. This allowed privacy for our patients, quick treatments, or consultations to be performed, and even emergently rescue patients if necessary.

To thoroughly use all resources available, the hospital leadership teams collaborated within our hospital system and worked extremely hard to get patients to the right level of care, even if that meant transferring patients within the hospital system. The process was cumbersome as it required patient approval, patient’s family input, nursing staff collaboration, physician acceptance, approval from the receiving hospital, bed availability, and coordination with Emergency Medical Services (EMS) to name just a few.

The leadership team met with the local EMS systems within the community and established time-out criteria during the critical surges that were affecting all the EDs in the county. This allowed the ED to safely shuffle patients and to momentarily take a breath from the hard, quick surges. Every resource was evaluated in the planning of safe patient care. We utilized the off-site Emergency Care Center (ECC) more than ever at this critical time. Outpatient imaging was offered at our ECC instead of scheduling at the main hospital. This allowed more testing for ED and admitted patients, thus improving patient throughput. We also dedicated two rooms at the ECC for monoclonal intravenous infusions which were previously being done in our ED. The reallocation of this vital healing treatment allowed the ED to gain this valuable necessary patient care space.

We developed an eight-recliner chair location that took up the absolute last bit of real estate within the hospital. This area was outfitted with the equipment necessary to provide safe patient care including portable oxygen tanks, partitions, vital sign machines, workstation-on-wheels (WOW), and portable monitors. This also helped to provide patients with some privacy and dedicated ED nursing staff when no beds were available. The triage area originally had two triage rooms to perform electrocardiography, quick laceration repairs, and any other immediate interventions needed. The ED leadership realized this was not enough treatment space when all ED care was being delivered within the ED lobby due to the ED rooms being occupied by patients waiting for an inpatient or observation room. Two additional rooms were identified within the triage vicinity: one that was previously used by patient registration staff, and one that was used by the clinical informatics nurse. These two offices were changed into patient care rooms, and the Facilities and Information

Technology (IT) Departments assisted in the transformation. Added equipment included a blood draw station, trash cans, and needle safety receptacles. The Pharmacy Department added a small medication pyxis in the triage flex room with medications commonly given such as acetaminophen, ibuprofen, and ondansetron. This helped staff with time management; they could work more efficiently instead of walking all over the ED gathering treatment supplies and intervention modalities from different ED supply rooms.

2.2 Rapid-Cycle interventions to increase space

By using all available real estate, 25 additional treatment spaces were added to the ED. This included utilizing hallways and an internal waiting area. Additional sharps containers, patient care supplies, and portable computer workstations were secured as well as renting additional stretchers and monitors, to ensure the delivery of safe patient care. Waiting room chairs were removed and replaced with recliners to make patients who had long wait times more comfortable.

With high-level collaboration among various departments within the hospital, the Pharmacy, IT, Facilities, Hospital Administration, and the Senior System Process Engineer, Vicky Stankovic worked together with the ED to carve out space within the diagnostic area adjacent to the ED and constructed a large open bay that accommodated 12 inpatient beds. This space was outfitted with new state-of-the-art inpatient beds and tablet devices for patient/family communication during times when visitors were not allowed in the hospital. Small details, such as tablet devices, were not overlooked as patient satisfaction was paramount. No supplies or equipment were spared in setting up this patient care area. Reclining chairs, wheelchairs, full medication pyxis, patient restrooms, a supply room equipped with patient care supplies, staff communication devices (Vocera), crash cart, partitions, new IV pumps, fall mats, and phones were just some of the resources provided. This space was closed in mid-January 2022, the day before the ED expansion of 23 additional beds had opened.

3. RESULTS

The effectiveness of the project was evaluated by four Key Performance Indicators (KPIs): ED patient volumes/encounters, LWBS, and patient satisfaction. These indicators were tracked monthly on an A3 quality form for visualization for the interdisciplinary ED team. Informal reporting of volume and holds were tracked daily when small unceremonious interventions were added day-to-day at times, for example, a pop-up portable lab draw station in the ED waiting room. The effectiveness of this project utilized short-term, small-scale interventions and long-term capital

expenditures. The ACU is an example of a small-scale intervention. A long-term intervention is the capital budget “brick and mortar” expansion of the ED over several months. Some interventions were not effective as others, but we kept moving forward. It is clear in the beginning that some interventions were not effective, because we continued to add or adjust small interventions (see Figure 2) and gradually over a year began to be able to see a decline in our KPIs except for patient volume which continued to rise from 27,429 ED visits in 2020 to 35,013 ED visits in 2021 (see Appendix A).

The most important KPI was LWBS which started the increase from 1.4% in January 2020 to an all-time high of 5.3% in January 2021 (see Appendix B & C). The LWBS percentages increased month-to-month in 2020 even with small, various interventions and none of the interventions seem to be sustainable. We would at times have small wins, but not sustainable wins. At times it felt like we were failing, but we never gave up. In January 2021 with our highest LWBS rate of 5.3%, we knew more had to be done. We raised the intensity of our interventions in February 2021 when our LWBS rate was 4.10% and the rate continued to decrease to 1.09% by January 2022. The biggest intervention to decrease LWBS was the addition of the PIT in September 2021. The PIT was able to expedite the MSE and provide immediate care, thus decreasing the number of patients that LWBS. Our LWBS rate drastically dropped to 1.05% for September 2021 (see Appendix C).

Patient satisfaction rates increased from 49.2% in January 2021 to a high of 63.5% in late 2022. Patient satisfaction scores were variable with a positive trend upward. In Appendix E the graph shows the overlay of ED volume, LWBS rates, and patient satisfaction scores to show the overall success of various interventions. In April 2021, with the opening of the 8 specialty hallway chairs, you can see the positive impact this made on patient satisfaction. These patients were removed from the noisy lobby to a comfortable recliner chair in the adjacent makeshift hallway. This area allowed for more privacy and patients responded well to this intervention. Not only did our scores increase from 44.6% to 51.2% from March 2021 to April 2021, but patients also voiced their content during our daily rounding.

4. DISCUSSION

The multifocal rapid-cycle change interventions improved the LWBS rate despite the critical surge in volume induced by the COVID-19 pandemic and the continued increase in ED volume over the last 12 months (see Appendix D). These interventions reduced the LWBS rates from an all-time high of 5.3% to 1.09% in January 2022 (see Appendix B & C). Although many of the rapid-cycle change interventions had

significant positive effects, the most effective change was the addition of medical provider(s) at triage to provide emergency care to patients when they arrived at the door of the ED.^[20] Other studies have also pointed to the effectiveness of a medical provider at triage.^[13,20]

Admitted patients being held in the ED for various reasons created a bottleneck in patient throughput and prevented ED staff from caring for ED patients unless the admitted patients were pulled into the ED hallways. The team worked tirelessly with internal departments and sought resources from other hospitals within the hospital system to care for the large influx of admitted patients awaiting beds. The ED leadership team collaborated with local EMS to provide intermittent reprieves when needed during critical surges. Each rapid-cycle intervention was deliberate and kept quality, safety, and patient satisfaction at the forefront (see Appendix E). The work continues towards providing the best patient care to our community by implementing rapid-cycle interventions as barriers arise.

Limitations

Our rapid-cycle process of improvement lacked substantial literature regarding best practices during a pandemic. In retrospect, however, other Asian countries have experienced similar pandemics and we were slow to learn from them. This study did not look at elopement or patients that left Against Medical Advice (AMA). During these rapid-cycle interventions in the 18-month journey, the ED was also undergoing a major expansion/renovation that started in the spring of 2020. At times during this expansion, precious ED beds were closed to accommodate construction needs. At times, the ED was down to 20 patient care beds and faced with the challenge of providing care to over 40 admitted patients boarding in the ED as well as ED patients seeking care. This was a challenging time, and, on several occasions, our 20-bed ED cumulatively housed over 100 patients demanding multiple levels of care (ED, ICU, Telemetry, Medical/Surgical).

5. CONCLUSION

As a learning organization, we are still studying how to address ED capacity issues and barriers to hospital throughput. ED patients who leave the hospital without being seen are at higher risk for safety and quality transgressions. The multifocal rapid-cycle change interventions implemented influenced the LWBS rate despite the critical surge of volume induced by the COVID-19 pandemic (see Appendix E). More research is needed to rapidly process and treat patients through the ED. Public safety is at risk when the ED does not have beds available for emergency patient care demands. Emergency Departments must continue to share lessons learned

and grow with the changing times to be prepared to care for communities during global pandemics and other potential national emergencies.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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