

A Nurse Practitioner Driven, Split-Flow Emergency Department Intake System

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No funding was received for this work.

### Abstract

As hospital emergency departments (EDs) in the United States face an increased patient volume, challenges emerge to provide effective patient care. This quality improvement project addresses the gaps in ED patient care related to patient flow through the ED by implementing the Door-to-Doc Toolkit. The Door-to-Doc Toolkit improves ED efficiency by redesigning the patient intake process. The cornerstone of the Toolkit is the use of an advanced practice nurse in triage to direct patient flow into the ED. The results of the project show a decreased number of patients leaving before receiving a medical screening exam and decreased time that patients spend in the ED.

**Key words:** left without being seen, provider in triage, triage, ED crowding, ED wait times

### A Nurse Practitioner Driven, Split-Flow Emergency Department Intake System

Governmental organizations, such as the Centers for Medicare and Medicaid Services (CMS), are increasingly placing pressure on emergency departments (EDs) to meet national benchmarks, and this pressure ironically makes it difficult for the EDs to function according to the standard (Newell et al., 2012). Additionally, much evidence correlates longer ED wait times with poor outcomes (Johnson & Winkelman, 2011). In an effort to create an evidence-based method to decrease patient wait times, Banner Health (2008) implemented a nurse practitioner (NP)-driven split-flow design in the ED, called the Door-to-Doc Toolkit, which has received national recognition from the Agency for Healthcare Research and Quality (AHRQ). This paper presents a discussion of the Door-to-Doc quality improvement project at a suburban emergency department.

The scholarly practice of an emergency NP, for the most part, focuses on improving patient outcomes within EDs by implementing evidence-based strategies. The Door-to-Doc Toolkit implementation at the ED places the emergency NP at the center of the change. Specifically, the emergency NP is responsible for directing patient flow through the ED from triage based on the patient's acuity level. For this project, the NP's advanced practice skills and scholarly practice role was combined to initiate an evidence-based practice change at the point of care to improve patient outcomes in the ED.

Poor outcomes in the ED are directly related to patient intake procedures and the length of stay within the ED. The delayed assessment of patients by a licensed independent provider (LIP), such as an emergency NP, is associated with long waits for pain medication (Pines & Hollander, 2008), reduced patient satisfaction scores (Tekwani, Kerem, Mistry, Sayger, & Kulstad, 2013), and increased mortality (Johnson & Winkelman, 2011). A needs assessment of

the ED demonstrated a gap in care compared with best practice recommendations. This gap in care demonstrated that “less sick” patients occupy much-needed beds when evidence-based strategies, such as the Door-to-Doc Toolkit, indicate that the less sick individuals should be kept ambulatory in a designated waiting area. While less sick patients occupied treatment beds, the “more sick” patients remained in the ED lobby without LIP assessment, risking a deterioration of their conditions. Further compounding the risk of poor outcomes from delayed LIP assessment, approximately 7% of patients left the ED without being seen by a provider as compared to the national average of 2% (Centers for Medicare and Medicaid Services [CMS], 2013a).

Hard core data to support the practice change included the six metrics that are reported to CMS as a contingency of the Tax Relief and Health Care Act of 2006 (CMS, 2013b). Specifically, the average time patients spent in the ED before they were seen by a healthcare professional at the ED was 54 minutes, compared to a nationwide average wait of 28 minutes (CMS, 2013a). While CMS is shifting from a pay-for-reporting to a pay-for-performance system (Newell et al., 2012), it was important for the ED to correct the deficiencies in care that could lead to poor patient outcomes, and ultimately, financial penalties for the organization. By implementing the Door-to-Doc Toolkit, the ED significantly decreased the number of patients leaving before they received a medical screening exam.

### **Conceptual Framework**

Nursing theory seeks to describe phenomena, predict patterns, and control events in order to make the summarization of isolated investigations meaningful and generalizable (McKenna & Slevin, 2008). To provide an impetus and give direction to the implementation of the Door-to-Doc Toolkit, Wiedenbach’s (1964) *Helping Art of Clinical Nursing Theory* was used. In her theory, she described four key components: the patient who is receiving the care; how great the

patient's need is for help; the way the nurse thinks, feels, and acts; and the nurse's overall knowledge of the major roles and requirements of the profession. Essentially, Wiedenbach defined the practice of nursing as identifying a patient's need for help, administering the required help, and validating that the help was indeed beneficial to the patient. For this quality improvement project, these three characteristics of nursing were used as the theoretical framework for ensuring that the needs of ED patients are met.

In the ED, the patients' needs for help are illustrated by evaluating patients' outcome data, such as national benchmarks. The benchmark data is a direct reflection of care provided in the ED. Numerous research reports describe the relationship between low benchmark scores and poor patient outcomes, and these results clearly demonstrate that there is a great need for change in how patient care is administered. The gap and SWOT analyses further support the need for a more efficient system of helping.

The administration of help begins with seeking evidence-based knowledge to transform the care process and improve outcomes (Wiedenbach, 1964). Through an exhaustive literature review, the Banner Health Door-to-Doc toolkit was identified as the best help available to improve the outcomes of ED patients. Outcomes will continue to be measured and will be compared against national benchmarks to validate the helpfulness of the intervention.

## **Method**

### **Procedure**

One month before the project's implementation date, the author started working with ED staff to provide education on the project's implementation and the process involved. Staff members took turns acting as simulated patients and walked through the ED patient experience from presentation to discharge, so that they would better understand patient flow. Emergency

department LIPs were educated one on one as patient volume allowed. In addition to educational posters in the ED break room, information sessions were provided at staff education meetings.

The total timeline for the project extended from March 2014 until July 2014. Beginning May 1, 2014, at 07:00, the Door-to-Doc process was implemented. The NP was in triage at all times and directed the intake of patients into the ED through the ambulatory entrance. Staffing for the triage department was flexed throughout the day as demanded by patient volume. As patients arrived, they had a quick registration consisting of the collection of the his/her name and date of birth. After the identification band was applied, the patient was escorted to an open triage room, where the NP, RN, and tech triage team awaited. With a team approach, a quick triage was performed to determine the patient's acuity and vertical, versus horizontal, status. The quick triage, which takes less than three minutes, consists of a short-phrase chief complaint and vital sign report. At this point, the NP decides if the patient can remain sitting vertical or if he/she requires a bed in the more acute portion of the ED. Afterward, the tech transports the patient to the appropriate treatment area.

Patients who qualify to remain vertical are taken to the ED Yellow Zone and placed in a treatment room, where they are assessed and treated by a team consisting of an LIP, a RN, and a tech. The team works synchronously to perform the medical history and the physical exam, collect any necessary samples, and perform any necessary treatment. When the team's work is completed, the patient is escorted to the results waiting area by the tech. If no tests are necessary, the tech escorts the patient to the discharge room, where he/she receives an informed discharge by the RN or LIP. As test results come in and the medical decision-making is completed, the patients are brought from the results waiting area back to a treatment room or to the discharge room by the tech for further treatment or discharge, as necessary.

Patients who are not able to remain vertical and need a stretcher for the ED visit are taken to the ED Red Zone, the Blue Zone, or the Resuscitation Bay. In these three areas, the patient is independently evaluated by the LIP and RN, and assisted by the tech. If at any point in the patient's ED course the patient qualifies for the vertical area, the patient is moved to the results waiting area to free up horizontal bed space. Patients in the ED Red or Blue Zones, or in the Resuscitation area, are discharged from their rooms. All patients being admitted, whether from the vertical or horizontal areas, are moved to the ED inpatient holding area (the Green Zone) where they await admission orders and an inpatient bed assignment.

**Setting**

United States Census data reported in 2010 listed the population of the North Carolina city as 200,564, with the population being 45.7 % Caucasian, 41.9 % Black or African American, 10.1 % Hispanic or Latino, 2.6 % Asian, 4.9% two or more races, and 1.5 % other races (United States Census Bureau, 2014). The median household income was \$44,756. The city is also home to a large military base by population, which houses nearly 239,000 people, including 53,000 active duty soldiers (United States Department of Defense, 2014).

The ED provides emergency care to all ages, although the adult ED was the only part of the emergency medical services facility included in this project. The adult ED staff consists of 22 physicians, 6 nurse practitioners, 13 physician assistants, 91 registered nurses, 8 paramedics, and 15 unit secretaries. The average daily and yearly census for the ED is 260 and 95,000, respectively. The executive staff for the ED includes an executive director, a director of nursing, three assistant nurse managers, and two assistant medical directors. The ED support staff includes an informatics nurse, a nursing educator, and three nurse trauma registrars.



## **Study Design**

Following institutional review board approval, a retrospective design was used to evaluate the timeliness of patient care in the ED. The project director reviewed ED patient encounters for the previous year to determine where deficiencies in care existed. Patient encounters following the project implementation were analyzed in the same manner and compared with the historical control group. The Door-to-Doc system was considered the intervention.

## **Inclusion and Exclusion Criteria**

All adult patients presenting to the adult ED from May 1, 2014 through June 30, 2014 were included in the project. Regardless of gender, ethnicity or pay status, all adults received care in accordance with the intervention. Patients seen in the pediatric emergency department were excluded.

## **Data Collection**

Data from the project's implementation was collected over a 60-day period. The data was collected every 24 hours by retrieval from the ED computerized charting system where the it was automatically recorded through physician and nurse charting. The ED charting system provided a daily summary of the data via a spreadsheet, thus avoiding the need for labor-intensive data mining and data entry.

In alignment with the project's aims and goal, and as mandated for all EDs by the Centers for Medicare and Medicaid Services (CMS, 2013), the outcome-based performance measures will include the following:

- The number of patients who leave before being seen by a LIP.
- The median time from arrival to diagnostic evaluation by a LIP.

- The median time from ED arrival to ED departure for discharged ED patients.
- The median time from ED arrival to ED departure for admitted ED patients.
- The time from admit decision to ED departure for admitted patients

The overall project goal was evaluated by comparing the above listed measures from the 12 months prior to the project's implementation to the measures obtained two months after project implementation.

### Results

This quality improvement project was designed as a method to improve patient outcomes in the ED by decreasing the time the patients spends in the ED and by decreasing the percentage of patients who leave the ED before receiving a medical screening exam. As displayed in Table 1, there has been a marked decreased in the percentage of patients who left the ED before being seen from 7% in April 2014 to 0.3% in May 2014. During the same time period, the median time from ED arrival to ED departure for admitted patients decreased by 52%. For patients discharged home, this time decreased by 25%.

Table 1

*Effect of the Door-to-Doc System Change on Emergency Department Benchmarks*

<b>Benchmark</b>	<b>Before Door-to-Doc</b>	<b>After Door-to-Doc</b>
Percentage of patients who left the emergency department before being seen	7%	0.3%
Median time from ED arrival to ED departure for admitted patients	502 min.	240 min.
Average time patients spent in the emergency department, after the doctor decided to admit them as an inpatient before leaving the emergency department for their inpatient room	94 min.	61 min.
Average time patients spent in the emergency department before they were seen by a healthcare professional	54 min.	11 min.
Average time patients spent in the emergency department before being sent home	200 min.	149 min.

## **Discussion**

The Door-to-Doc system has been adopted by many EDs in the United States as a method of sorting patients into sick and non-sick categories thereby freeing up more beds for sick patients. Project findings demonstrate safe, timely, and efficient care delivered by the Door-to-Doc system. The patient experience has been remarkably transformed. Not only has customer service improved because of decreased wait times, but also decreased wait times has led to a lower left without treatment rate. Now, instead of patients who really need emergent care leaving before treatment, patients are receiving treatment in an emergent manner, thereby decreasing their chances of experiencing an exacerbation of symptoms.

In addition to improving the patient experience, our ED has decreased waste of resources. According to tradition, all patients who presented to the ED were placed in a bed. With the Door-to-Doc concept, not all patients need a bed and can remain vertical or sitting in a common area with other patients. For each patient kept vertical, one less room is used, one less room has to be cleaned, and one less patient that requires a bed has to wait. Since implementation of the Door-to-Doc system, about two-thirds of the beds previously used are now used.

## **Limitations**

One significant limitation of this quality improvement project was time. Retrospective data for the ED is available for over 10 years. However, data after the intervention is limited to 60 days for project inclusion due to collegial requirements. Ideally, data collection and evaluation will be a continuous process to allow for a more accurate determination of the project's effectiveness over time.

### **Conclusion**

As demands for better healthcare outcomes in the ED increase, the emergency NP is in a prime position to coordinate patient flow in the ED and assess patients at triage, initiate interventions. The impacts of this project include a decreased length of time that patients wait to see an ED practitioner, decreased number of patients who leave the ED without being seen by a LIP, and decreased overall length of stay in the ED. Further, even more patients can be served than before as a result of decreased wasted resources. This quality improvement project demonstrates a unique method of improving the delivery of patient care in the ED by augmenting patient flow through the utilization of a NP in triage.

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