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Destination Arrival and Discharge Unit to Improve Patient Flow

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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2019

Abstract

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MSN, Gardner-Webb University, 2010

BSN, University of South Carolina-Upstate, 2004

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Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The increase in patients presenting to the emergency department (ED) for primary care poses a serious safety issue in the care that can be provided. In a care area that is overcrowded, physicians, nurses, ancillary department staff, and other care team members may have a difficult time delivering care. Poorly managed flow in the ED leads to overcrowding, and patients with life-threatening illnesses are less likely to be transitioned to designated specialized areas in a safe and efficient manner. The practice-focused question was whether processes to improve the flow of patients entering the ED decreased the number of patients leaving without being seen, decreased time from the time entering the ED to hospital admission, improved the average length of stay, and increased patient satisfaction. The plan-do-check-act methodology was used to address this quality improvement project. Results of the project demonstrated a decrease in the number of patients leaving without being seen, a decrease in the time entering the ED to hospital admission, a decrease in average length of stay, and an increase in patient satisfaction. This project provided positive social change to the patients, families, organization, and community by improving the ED processes to ensure patient needs were addressed as rapidly as possible.

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Dedication

This is project is dedicated to the organization who encouraged me to bloom where I was planted and to the case management team who empowered me to remain steadfast regardless of life's obstacles and challenges.

Acknowledgments

First, I would like to thank God for carrying me and allowing me His grace and mercy to endure to the end. I would like to express my sincere gratitude to Walden University, my committee chair Dr. Diane Whitehead, Dr. Mary Verklan, Dr. Oscar Danny Lee, other members of the Walden University nursing faculty, and committees for your guidance and support. A special thanks to my mentor Mrs. Dottie Catena-Mileto for pushing me when I felt defeated but mostly for her leadership and constant support and encouragement and to Randy Spivey who provided me with valuable guidance. To my husband, JC, who is always in my corner, thank you for your unwavering love and support. Philippians 4:13 – I can do all things through Christ who strengthens me.

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Section 1: Nature of the Project

Introduction

Emergency department (ED) overcrowding compromises patient safety by increasing patients' average length of stay (ALOS), patients who leave without treatment (LWAT's), time entering the ED to hospital admission, thus eroding community trust through decreased patient satisfaction. Seamless facilitation in patient flow will not only provide safe and efficient care but will ease access to emergency care (Lo et al., 2014). The decrease in the quality of care areas, coupled with a potential for adverse outcomes is another concern when there is a backlog in flow. There is a direct correlation with increase length of stay in the ED and mortality when patients are not transitioned to designated and specialized care areas because of ED overcrowding (Emergency Nurses Association [ENA], 2017). The purpose of this quality improvement project was to implement a process change addressing the concerns of patient flow, ED overcrowding, and challenges that prevent safe offloading of patients to designated care areas.

As a main port of entry into the healthcare system, the ED is clearly the most frequent area where first level patient encounters are experienced. Not all patients presenting to the ED carry an emergency level of care. In 1986 the Emergency Medical Treatment and Labor Act (EMTALA) was enacted. The EMTALA requires that all patients must be triaged and seen by a provider. An increase in patients presenting to the ED for non-emergent complaints places a significant strain on the system, creating a *backlog* or flow problem.

There has been an increase in the number of patients using the ED as a means of primary care. As the number of visits has been steadily increasing over the past two decades, there has been a decrease in the number of hospitals delivering care (Lo et al., 2014). Patients presenting to the ED for nonemergent care has produced significant overcrowding with a backlog and inability to safely transition patients to designated areas of care. Patients entering the ED can experience extreme delays waiting for treatment.

Problem Statement

A community hospital in the southeast United States experienced greater than ALOS and LWAT rates than the national average benchmark set by the U.S. government. Door-to-decision to admit and safe off-loading patients to designated care units were performing below organizational expectations and below benchmarked peers. Processes currently in place not only created overcrowding, but decreased patient satisfaction resulting below the benchmark scores.

The hospital implemented a rapid triage process and patients who were nonemergent were rerouting through fast-track ED in hopes to offload the main ED to care for Level 4 and 5 triaged patients, which are the most serious and life-threatening emergencies. Despite the rapid triage process in place, the ED continued to be inundated with nonemergencies, creating a flow issue. In addition to the 26 main ED beds, there are six hall beds that are used as an overflow area. The patient volume and the number of available ED beds placed a demand on the health care team and the organization as they struggled to provide quality health care in a timely manner.

Background and Context

An ED provides service to the populations who are either acutely ill or injured. The age group of patients who are treated in an ED span from adults to infants. The practice of EDs are patient-demanded and requires continuous accessibility in a stressful, fast-paced environment. Services provided range from trauma, serious and complex medical conditions, injuries, and nonurgent care. EDs provide acute and nonurgent care in which some patients can be treated and later discharged, while others require extension care and ongoing treatment in a hospital inpatient setting (Ashour & Okudan- Kremer, 2016).

In order to provide quality health care delivery, the hospital should have strategies to prevent ED overcrowding and move patients seamlessly through the system. In 2012, this facility implemented a fast-track ED process where non-urgent patients were treated without occupying beds in the main ED suitable for patients requiring complex care. The process of using fast-track ED worked well for a few years, however, despite generous efforts to treat patients promptly, the ED continued to be challenged with flow issues. The specific problem of overcrowding was not caused by lack of nurses, but because of increased patient demographics and lack of strategies to offset the demand. Minimizing deficiencies that contribute to overcrowding is crucial to the delivery of quality health care and a key component of continuous quality improvement (Reinhardt, 2017).

Purpose

Processes currently in place not only created overcrowding but decreased patient satisfaction below desired benchmarks. Inadequate communication between inpatient

care areas and ED, delay in the triage to first encounter with provider, lags in ordering and receiving diagnostic test results, and location of the ED case managers all contribute to a lack of transitioning patients effectively. To address the practice problem described, the hospital assessed patients through a rapid triage process and offloaded those who are nonemergent to the fast track ED. The triage process included a screening by a registered nurse, a midlevel provider first encounter within 15 minutes of arrival and ordering of any laboratory or diagnostic testing. Patients were identified as admit status, appropriated for fast track, required additional testing, or marked as potential for discharge. Additionally, reporting off to the inpatient units required a face-to-face report, where the ED staff registered nurse (RN) offered a report to the inpatient nurse.

The purpose of this project was to implement processes that will improve the ALOS, LWOT rates, decrease the door-to-decision to admit, and increase patient satisfaction. As strategies such as rapid registration, destination units, streamline triage, point of care testing, and improved fast track are developed and implemented, improved patient satisfaction metrics and patient outcomes will be achieved (Yarmohammadian, Rezael, Haghshenas, & Tavakoli, 2017). While it is not feasible to change the ED structurally, process changes to improve flow systemically were implemented at the patient encounter level. The practice-focused question was: Will processes to improve flow of patients entering the ED decrease LWOTs, decrease time from door-to-decision to admit, and improve ALOS and patient satisfaction?

The purpose of this project is was decrease ED overcrowding and patient backlog and to improve triage-to-provider times. Strategies to address this goal included:

(a)improvement in the triage process, (b) point of care testing, (c) increase in the use of fast track ED, and (d) an enhanced registration process. Monthly emergency service committee meetings were included to identify gaps in current processes and correct deficiencies.

Practice-Focused Question

The practice-focused question was: Will processes to improve flow of patients entering the ED, decrease LWATs decrease time from time entering the ED to hospital admission and improve the ALOS and patient satisfaction?

Nature of the Doctoral Project

This project evaluated the performance metrics patient satisfaction, LWATs, decision to admit time, and ALOS. The sources of evidence supporting the processes implemented in the ED included peer-reviewed evidence from Walden University online databases including CINAHL, CINAHL Plus with Full Text, Medline, PubMed, and Ovid health databases. The search key words, Boolean phrases, and terms included emergency department overcrowding, ED throughput, ED length of stay, ED quality metrics, patient satisfaction, and left without treatment will be explored. The literature search was conducted from primary sources to include peer-reviewed journal articles, academic resources, and books dated 2013 to present.

Deidentified data was provided by the facility for ED wait times, door to decision to admit, ALOS, and LWAT. Data pre- and postimplementation of the change in ED processes was analyzed for one month prior to implementation and one-month postimplementation. Descriptive statistics was used for the analysis.

Significance

The impact of this project affected various stakeholders throughout the hospital. The amount of time that nurses spent in caring for patients due to delayed time in transitioning to the floor decreased. The ancillary departments were also stakeholders in this project. Deficiencies and ineffective processes in turnaround time for test results can be a barrier in providing care and significantly impacted physicians' treatment. The hospital was an important stakeholder. Hospital reimbursement is based on how they reach the quality metrics from CMS. Patient length of stay in the ED and patient satisfactions are a part of the date reviewed when determining theses metrics. The implementation of a smoother and faster transition of patients from the ED department to an impatient status decreased length of stay in the ED and increased patient satisfaction with the care provided by the department.

Patient flow is a growing concern affecting not only acute care organizations but ambulatory service centers, clinics, and physician practices. With the implementation of an improved process to safely and effectively provide timeliness of care, patient flow can be optimized in other health care settings through scheduling of appointments uniquely to the patient, standardized scheduling for surgical interventions, and having available staff to meet patient demand during high volume times (Akhtar, Brouns, Wales & Ward, 2017).

Implications for Social Change

The implementation of this project set the beginning of a positive social change within the ED environment. According to Morris (2017), social change can be observed

at the individual and organizational level. Social change is usually driven by real-world implications (Morris, 2917). Many people who find themselves in the ED often hesitate before going or do not go until necessary, mainly because of the wait time. Once the community is aware that ED wait times have decreased, patients would be inclined to come and not wait until there condition is at its worst.

Summary

Swancutt et al. (2017) suggested that slow patient flow was a challenge in an acute care setting but when compounded with flow in the ED, posed a significant impact and concern for care of patients. The ED environment cannot be controlled; however, processes and gaps in processes can be improved to create a progressive flow of patients without affecting quality of care. Identifying barriers that affect ALOS, patient satisfaction, door-to decision-to admit, and reducing LWOTs show promise in improving how care is delivered in an uncontrolled and unpredictable environment. Section 1 explored the rationale for the project, the problem statement, purpose, and significance of the project to clinical practice. The purpose of this quality improvement project is to develop and implement a process to improve patient flow of patients entering the ED. The practice-focused question is: Will processes to improve flow of patients entering the ED decrease LWOTs, decrease time from door-to-decision to admit, and improve ALOS and patient satisfaction? In Section 2 I describe the model supporting the project, project relevance to nursing practice, local background and context, and my role in the project.

Section 2: Background and Context

Introduction

In section 1 I discussed the importance of ED processes that will improve the flow of patients entering and leaving the ED. The practice problem addressed is the patient flow in the ED and how deficiencies in flow processes leads to adverse outcomes. The purpose of this quality improvement project waste develops and implement a process to improve patient flow of patients entering the ED. The practice-focused question was: Will processes to improve flow of patients entering the ED decrease LWOTs, decrease time from door-to-decision to admit, and improve ALOS and patient satisfaction? Section 2 included the plan, do, study, act (PDSA) model that supported the quality improvement project. relevance to nursing practice, local background and context, and role of the DNP student.

Concepts, Models and Theories

To guide this evidence-based project, the PDSA model (Appendix A) was used to examine improvement in (a) patient satisfaction, (b) LWAT, (c) ALOS and (d) door to decision to admit. The PDSA model is a model that uses four stages to problem solve to aid in identifying a goal of process to implement change. As a change model in determining quality improvement, the PDSA is used to measure quality in health care, Steps in this model include: (a) planning the change, (b) testing or piloting, (c) observing what's learned from the change, and (d) acting on or carrying out the change and refine if necessary. Not only does this model aid in improving patient outcomes by determining if change implemented will lead to improvement, but it also serves as a cost reduction

strategy model in health care organizations (Institute of Healthcare Improvement [IHI], 2017).

The PDSA has been used for continuous quality improvement in clinical practice, promoting positive outcomes for patient populations (IHI, 2017). Identifying the clinical problem will begin the focus and the first phase of the change cycle. The focus of ED overcrowding, and patient flow will be examined and what strategies can be implemented to improve patient flow, reduce ED overcrowding, and process patients from the ED to designated care areas in a timely manner.

An academic tertiary care center in Toronto, Canada used the PDSA model to address an increase in patient demand and ED congestion affecting quality of care. With a 6% increase in patient volume, timeliness of care in meeting demand for service were compromised. The PDSA model was used to identify communication barriers affecting turnaround times (Chartier, Simoes, Kuipers, & Mc Govern, 2016).

The project followed the steps in the quality improvement PDSA model. PDSA cycle addresses three questions:

1. What are we trying to accomplish?
2. How will we know that change is an improvement?
3. What change can we make that will result in an improvement? (CMS, 2018).

Table 1 displays the PDSA cycle and the project processes that will be completed for each stage.

Table 1

PDSA Cycle Related to Project Processes

PDSA Cycle	Project Processes
Plan	Identify the change Identify participants Identify resources Identify data to be collected
Do	Carry out change
Study	Analyze results Summarize successes, failures, surprises, unintended consequences
Act	Decide to adapt (modify and repeat), adopt, or abandon approach

Note. Adapted from CMS (2018). PDSA Cycle Template retrieved from https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/downloads/pdsacycledebedits.pdf

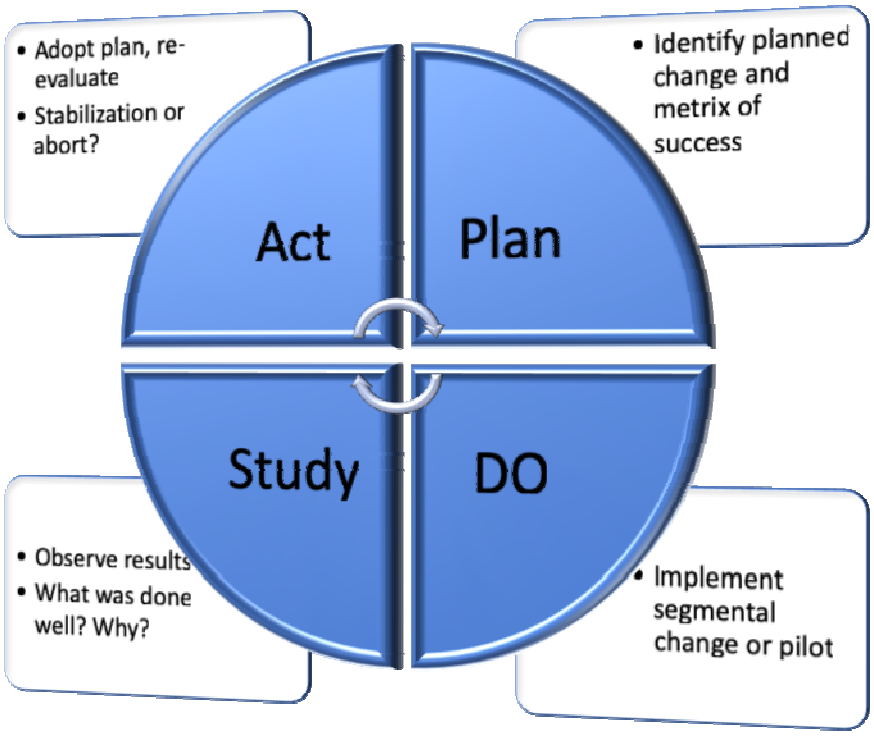


Figure 1. Plan, do, study, act model.

Plan

An assessment of the ED was conducted to determine process breakdowns that resulted in delays. Moreover, ancillary departments were assessed to examine efficiency and timeliness of tests and diagnostics, any lags in the registration process, or if patients may be contributing factors. During the assessment phase, I assessed workflow process of the nursing staff as well as the tools they are given to manage their work. Door to decision to admit, LWOTs, ALOS, and patient satisfaction are all metrics that are affected significantly by patient flow issues and conducting a thorough assessment helped me to better understand the barriers to moving patients seamlessly. I obtained deidentified data related to arrival, departure, and door to decision to admit.

In developing the quality improvement project, guidelines from the TJC approved standards to address patient flow, the leadership standards guidelines for ED throughout, and provisions of care. The ED Standards or performance measures was set by CMS in January of 2012. To maintain accreditation with TJC, EDs across the nation must maintain specific quality performance measures respective of clinical diagnosis and conditions. Guidelines for performance in which EDs must maintain is found in the National Hospital Inpatient Quality Measures Specification Manual and outlines in detail ED regulatory standards set forth by CMS. In addition to best practices, recommendations and benchmark data is shared for continued quality improvement (TJC, 2017).

Do

Rapid triage was performed with a nurse to patient and patient to provider within 30 mins of arrival. A decision of appropriate level of care was determined and indicated if patients are safe to wait in the waiting area, meet admission criteria, or can safely be treated in the ED fast track area. Point of care diagnostic testing will be initiated during the triage process.

Study

Data collection was completed for one month after implementation. Table 2 describes the metrics and goals for the project.

Table 2

Emergency Department Metrics and Goals

Metrics	Goal
Door to Provider (minutes)	30
Door to Discharge (Home) (minutes	140
Door to Departure (IP) (minutes)	240
CC (Care Complete) to Admit Depart	60
Overall TAT (minutes)	150

Act

Based on analysis of findings listed in Table 2, deficiencies and/or failure in the implemented plan were re-evaluated. Meeting with the ED team, quality department, and ancillary departments l aided in identifying opportunities for improving the implemented change. Because patient flow was a critical issue, barriers of why the executed plan did or did not work were discussed. Surge capacity planning was practiced in the organization because of the seasonal state and ED throughput is of major concern.

Definition of Terms

Patient satisfaction: Also known as "patient experience", is an important metric used to measure quality of care in health. It pertains to patient-centered care and affects patient outcomes, patient retention, and reimbursement (Kane et al., 2015; Prakash, 2010).

Left without treatment (LWOTs): Those patients who presented to the ED for treatment, were triaged, but left before seeing a health care provider (Arab, Movahed Kor, & Mahmoodi, 2015).

Average length of stay (ALOS): A measurement of the average time the patient remains in a department or treatment area (Asha & Ajami, 2014).

Door-to-decision to admit: The time in which inpatient bed is request and the time that transpires before the patient is transitioned to the designated care unit or the time in which the patient leaves the ED for the designated care unit (Wiler et al., 2015).

Relevance to Nursing Practice

In this doctoral project, the local nursing problem was lack of effective ED processes causing long ED wait time, ALOS, door to decision to admit, and increasing patients LWAT. Overcrowding of patients was identified as a quality improvement issue that caused undesirable outcomes. Nurses were challenged to care for patients held in the ED because of unavailable beds and incoming patients needing urgent or life-sustaining care (Khanna et al, 2016). With an influx of patients, staff may feel rushed or anxious about the care patients are receiving, likewise, patient satisfaction may decline because of feelings of inadequate care because of ED overcrowding (Hunsaker, Chen, Maughan, & Heaston, 2015). A domino effect can happen when processes to provide safe, efficient care is not in place.

Effective processes can help identify patients who are sickest and need inpatient care. Avoiding a lengthy ED stay requires process changes and effective triage can decrease patient backlog (Bish, McCormick, & Otegbeye, 2016).

ED Wait Times

Challenged to meet the throughput metrics set by the Centers for Medicare and Medicaid Services (CMS), Bish et al. (2016) used a multidisciplinary team approach to reduce wait times and improve the patient experience. A split flow process began in registration and extended to a rapid triage where there was a joint evaluation by practitioners. Upon implementation of the split flow process, median LOS and door to diagnostic evaluation were decreased to 112 minutes and 30 minutes, respectively.

Baker, Shupe, and Smith (2013) suggested three evidence-based practice models to achieve flow and reduce wait times. The provider-in-triage, super-track, and split flow models were all examined to establish ease of moving patients during critical hours of operation. Optimization of patients through the system during peak times remains a challenge; however, strategies to improve deficiencies, reduce sentinel events, improve safety, and reduce wait times begins with best practice models (Baker et al, 2013). Implementing best practice models can improve wait times and lead to bed availability for emergent patients. Crucial questions when implementing change is identifying challenges and gaps in the system. The strength of this study suggested ways to implement models to improve throughput. Engaging executive administrators and frontline staff in the need to provide seamless care can improve ED wait times. The study was limited by few researches on these types of models to achieve a reduction in wait times (Baker et al, 2013).

Reinhardt (2017) proposed a streamline triage process to avoid patient waiting. For instance, Reinhardt suggests nurses can critically assess unique situations and

identify opportunities for improvement. When patients present for care, having direct contact with a seasoned nurse who has the capability to accurately assess the patients' condition, can minimize wait times. Based on chief complaints, vital signs, and past medical history, nurses can safely triage and determine the need for immediate medical screening in a safe and efficient way. Because of the unique and important role nurses have in treatment and care, they can be strategically positioned in area to streamline ED processes, thus reducing wait times.

In a descriptive study, the Queueing Model was used to evaluate changes in the ICU bed assignments and how bed availability affects patient wait times. According to Mathews and Long (2015) simulation inputs was developed to indicate triage protocols in critical care areas and the Queueing model was used to describe key inputs. Based on simulation of observed illustrations, patients admitted to varying levels of critical care beds whether from the ED or not, received priority based on acuity level. Outcomes of the study indicated the Queueing model showed promise in improving outcome measures in improving throughput of patients admitted to specialized care areas.

For example, in a study conducted by Jo et al. (2015) ED overcrowding was found to have an adverse effect on trauma patients who were held in the ED rather than transitioned to the critical care unit after the decision to admit. The delay in treatment posed a major effect on receiving life sustaining measures. Patients held in the ED because of process flow issues and who are designated ICU status are more likely to become readmits to the ICU following a hospital stay. Researchers have further indicated this may be due to a prolonged wait in the ED and the inability of the nurse to provide the

2:1 nurse-patient ratio care typically provided in an ICU setting (Hostetter & Klein, 2013). To aid in resolving ED overcrowding, many suggestions have been posed. One such recommendation is more primary care involvement in directly admitting patients, thus avoiding the ED. An offload unit designed to accommodate patients requiring less urgent care on arrival and discharge, but still need an acute care admission, may show promise in increasing efficient and safe patient flow (Lo et al., 2014).

Door to Decision to Admit

Door-to decision to admit is a performance measure implemented by CMS in January 2012. This performance measure demonstrates an organization's ability to successfully manage unscheduled volume without holding admitted patients in ED designated beds (Institute of Healthcare Improvement [IHI], 2017). Collaboration and coordination of care will allow for quicker turn-around times and decision to either admit to designated inpatient units or discharge from the ED. Patients who are held in the ED are generally sicker and do not receive the same level of care as they would in a capable inpatient unit. Because critically ill patients can decline rapidly, assessment by a triage nurse will enhance patient being moved to inpatient beds. Plans to manage deficiencies will include quick initial practitioner to patient contact (Sharieff et al, 2013).

Average Length of Stay

The Average Length of Stay (ALOS) is defined as the time a patient arrives to be treated to the time a patient is either admitted or discharged from the ED. Increased wait times or long stays indicates a deficiency to transition patients effectively. Decreasing the time patients wait will increase access to health care and promote quality care (The Joint

Commission [TJC], 2017). Reducing the ALOS will improve specialized care, allowing more time for additional therapies if necessary. Will process improvement focused LOS, ambulance diversion will decrease, and the ED will not become overburdened and unable to respond to the needs of the community (TJC, 2017).

Leave Without Any Treatment

Patients who present to the ED and then leave without receiving any treatment (LWAT) pose a significant health concern. Because prolonged wait times has been associated with adverse outcomes and patient dissatisfaction, Rotteau et al (2015) used lean methodology to improve patient flow. Conducted over a three-year period, the study examined the effects of long wait times on quality of care. During the first observed year, LWATs decreased but there was no improvement in wait times. Over year two and three, there was a decrease in wait times, LWATs, and time to medical screening. The study suggests development in process improvement to reduce ALOS, requiring system-wide collaboration to achieve goals. Multi-hospital systems were involved in the study and span over years making contributing factors difficult to identify. Although some implemented practices were successful and sustainable in some hospitals, others met with significant challenges (Rotteau et al, 2015).

Overcrowding in the ED is a growing concern that has a primary focus of regulatory agencies. Because of limited bed capacity, patients who leave without being treated has increased which constitutes liability for the organization and increased morbidity and mortality. Deficiencies in the ED has been identified as significantly

impacting patient outcomes and calling for improvement by reporting timeliness of care to the Centers for Medicare and Medicaid Services [CMS], 2012).

Systemic approaches and redesigns to patient processing have been identified as ways to rapidly assess for inpatient or outpatient status, transitioning them quickly and appropriately, and decreasing LWATs. A high ALOS in the ED is also a contributing factor to LWATS, therefore, increasing the need for rapid assessment and connection with a care provider. According to Sharieff et al (2013) focusing on an ED redesign with rapid initial patient to practitioner contact, not only decrease ED wait times, but reduce the LWATs.

ED Patient Satisfaction

ED quality metrics are a set of standards or best practice measures to improve quality of care provided in the ED setting. The Joint Commission (TJC) has a set of processes to which ED are held to provide high quality care. In addition to core measures, appropriateness test, timeliness of interventions, and patient satisfaction has been identified as means of assessing quality in care. Prioritization in effective, patient-centered, timely, safe, efficient, and equitable care has also been paramount to quality metrics as set forth by TJC. Indication of how satisfied or dissatisfied a patient is with their care can be a judgment to the quality of care provided. Patient satisfaction is the perception of how "good" the care being delivered is. While patients may not be able to judge technical problems in health care, they can determine how a care practitioner made them feel (Bodenheimer & Sinsky, 2014).

Interventions to improve ED quality metrics were conducted in a hospital in Cambridge. Through collaboration, a comprehensive process to improve patient flow was implemented to decrease ambulance diversions and to reduce the average length of stay in the ED. According to Sayah, Rogers, Devarajan, Kingsley-Rocker, and Lobon (2014) patient volumes grew; however, left without treatment patients dropped from 4.1% to 0.9%. A re and postintervention survey was conducted to examine the impact and showed a significant improvement in the ED quality metrics without adding additional staff or reducing resources. Operational and system changes accounted for a positive impact on ED quality measures and when implemented in a collaborative manner, will improve patient satisfaction and outcomes.

ED nurses are challenged to care for patients held in the ED because of unavailable beds and incoming patients for urgent or critical needs (Khanna et al., 2016). According to Sayah, Rogers, Devarajan, Kingsley-Rocker, and Lobon (2014) implementing strategies system-wide rather than depending heavily on capital budget is key to improving patient flow and patient satisfaction.

Measuring quality in health care is challenging but since the Institute of Medicine (IOM) defined quality healthcare in its 1999 Crossing the Quality Chasm, hospitals have been burdened to align the concept with practice. In a study by Jo et al (2015) the association between ED overcrowding and mortality rate among critically ill patients were evaluated. Jo et al postulates that serious harms arise because of ED overcrowding and when patients who are critically ill presents to the ED and are not bedded to their designated care units, the risk of mortality increase. For example, patients who present to

the ED in a critical state and are admitted to the intensive care unit (ICU) and a bed is not available, in the ICU, the prolong ED stay can result in early mortality. Treatment and procedural delays were significant contributors to inpatient mortality. Limitations of the study were based on disease specific diagnosis and patients who may have had a terminal illness upon presenting to the ED.

Local Background and Context

This DNP project was conducted in a 200-bed acute care facility located in southeastern United States. The hospital was not meeting the national benchmark for patient experience/patient satisfaction, patients who LWOS, door to decision to admit, or LWAT. Despite efforts set forth in patient flow and weekly meetings centered around improving the Hospital Consumer Assessment of Healthcare Providers (HCAHPS), scores remained below the national benchmark.

With the implementation of the Patient Protection and Affordable Care Act of 2010, hospitals who performed poorly are at risk of financial penalties and information gathered on performance is also publicly reported for consumers. Realizing patient flow not only affects the ED but creates a systematic problem, the health care organization was seeking evidence-based interventions to improve patient flow that will have a direct and positive impact on patient outcomes.

Role of the DNP Student

I am the director of case management and serve as a member of the quality council. As a part of the quality council, the focus is improvement of health care and health involved initiatives in the organization. Patient flow issues were identified as a

quality of care concern from ED staff and members of the quality team. This project afforded me an opportunity to explore the evidence supporting effectives ED processes and implement strategies to address this problem.

Summary

The literature supported the idea that patient flow is a significant concern for EDs in the United States and is one that can greatly impact patients in a negative way. Because patients who experience prolonged waits in the ED due to flow problems have an increased risk for adverse outcomes, current designs and care pathways need to be re-examined to correct deficiencies. Section 2 introduced the PDSA model, the current evidence relevant to the practice problem and my role in developing and implementing this quality improvement project. The practice-focused question was: Will processes to improve flow of patients entering the ED decrease LWAT's decrease time from door-to-decision to admit and improve the ALOS and patient satisfaction Section 3 described the process for implementing and evaluating the project.

Section 3: Collection and Analysis of Evidence

Introduction

Strategies for improving workflow and ED processes are key to reducing overcrowding and patient flow issues. Because patient flow and deficiencies in the ED can result in adverse outcomes, addressing overcrowding of ED patients and patient flow issues can improve patient outcomes. According to Lo et al. (2014) patient flow and subsequent overcrowding accounts for an increased ALOS of patients entering the ED for treatment and care, and for some patients, represent ED boarding, where care designed on a specialized unit is not delivered timely but is delivered in the ED setting. Section 3 described the sources of evidence that were used to develop this quality improvement initiative, the plan for project development and analysis and synthesis of the results.

Practice-Focused Question

The purpose of this quality improvement project was to develop and implement a process to improve patient flow of patients entering the ED. The practice-focused question was: Will processes to improve flow of patients entering the ED decrease LWOT's, decrease time from door-to-decision to admit, and improve ALOS and patient satisfaction?

Sources of Evidence

Evidence was from a variety of electronic systems within the hospital. The Pulsara system provided data about patients with ST elevated myocardial infarction (STEMI) and those who presents with an acute stroke, specifying timeliness of care. The data collected from the self-serve kiosk identified high risk individuals for classic chest

pain and atypical signs of MI. Stroke patients and those with recent onset of symptoms, sepsis, and greater than 20 weeks intrauterine pregnancy (IUP) will be verified. Identification of Level 1 and 3 patients at the point of presentation were rapidly assessed and connected with a care provider.

The Medhost system provided data about ALOS, Door-to-care complete, Door-to-decision to admit, and ED volume. Lastly, AS-400 provides data on previously admitted patients. The computerized systems were accessed after receiving permission from the Chief Operating Officer (COO) of the hospital. The data will be collected for one-month period before and after implementation of the project.

Do

Participants included the ED nurses and the persons coming to the ED for care. Several changes were implemented in the way nurses dealt with including patients. Walk-in patients signed into the kiosk to sign in electronically. This information was reviewed by the registration staff to verify patient information. Triage nurse assessed patient. Patient was sent to: (a) fast track Ed, (b) main ED, or (c) back to waiting area for non-emergency patients. Patients coming from ambulance did register at the kiosk. They were seen immediately by the triage nurse, assessed and sent as outlined above. Registration was done once the decision is made for placement. In some instances, a patient returned immediately post-discharge because the family stated that they could not care for the patient. After evaluation by the triage nurse the patient was seen by the ED case manager for alternative placement

Protections

IRB approval will be obtained from Walden University # 01-16-19-0131909. A letter of support was submitted by the facility to Walden IRB. Data obtained were abstracted through the hospital's computerized electronic record which is from the database and recorded during the registration process, the admission process, and at time of discharge. The data was obtained by logging into system with protected password. Permission to access this deidentified was obtained from the to the chief operating officer (COO) of the hospital.

Analysis and Synthesis

Data analysis included: (a) LWOT, (b) time from door-to-decision to admit, (c) ALOS, and (d) patient satisfaction scores. A random chart audit of retrospective care was completed to determine wait times and time-to-provider to determine appropriate triage level assigned. The computer system programmed to randomly selected 10% of patient admissions one month prior to the change and one month after the implemented change. An excel checklist was compiled to record data relevant to the project. Triage times, time to provider first encounter, time to departure, whether admitted or discharged was analyzed. The analysis of data based on ED wait times and extended wait times was calculated. The data was analyzed using the Statistical Package of the Social Science (SPSS) software. Descriptive statistics was used to measure data and provide a summary of the project.

Based on PDSA model, the final step was to adapt (modify and repeat), adopt, or abandon approach. Recommendations are discussed in Section 4.

Summary

The practice question was: will processes to improve flow of patients entering the ED decrease LWOT's, decrease time from door-to-decision to admit, and improve ALOS and patient satisfaction? Section 3 described the activities to be completed using the PDSA model to address this question. Section 4 described the findings and recommendations from project implementation and analysis.

Section 4: Findings and Recommendations

Introduction

The identified problem of ED overcrowding and decreased patient flow in the acute care setting had been an ongoing issue for this facility. Research on best practice strategies in ED throughput had generated conversation on various plans and workflow processes currently prevalent in healthcare. This project was conducted in an acute care facility in the Southeast United States. Using the PDSA model, this quality improvement project focused on implementation and evaluation of sustainable practices to decrease ED overcrowding.

Findings and Implications

Implementation

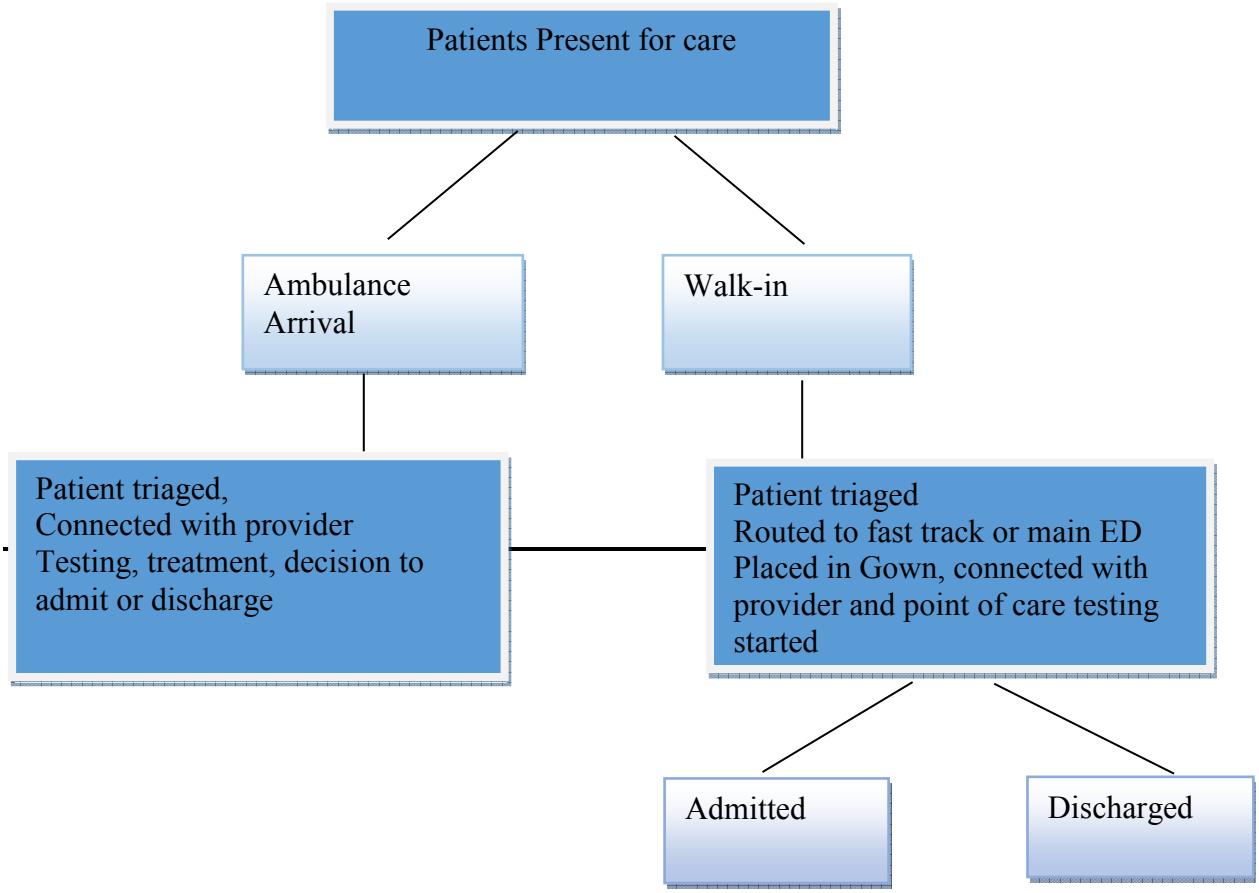
Stakeholders in the new implementation consisted of the ED director, ED physicians, registered nurses, registration personnel, executive leadership team, and ancillary departments. Current processes that impeded patients transitioning seamlessly was identified by the team. Rapid triage and point of care testing were initiated once the initial complaint was obtained and vital signs performed.

The use of the self-service kiosk allowed identification of patients who were high risk for adverse outcomes, including those with classic and atypical chest pain symptoms. Other patients who were not appropriate for ED fast track were those presenting with recent or new onset stroke symptoms, patients with sepsis, and obstetrical patients over 20 weeks gestation. Patients were processed either to the main ED or fast track ED once a comprehensive assessment and initiation of primary diagnostic testing was completed.

The rapid triage helped to determine if patients needed admission or could be discharged once care was completed. Figure 2 diagrams the change in flow.

Figure 2

New Process Flow



Some areas of concern were the capability of the RN pool to conduct comprehensive assessments of patients to determine the level of care most appropriate and to make the decision to send patients to the ED fast track opposed to the main ED. To address this concern, only RN's with ten or more years of ED experience were used in triage. Additionally, annual competency evaluation and exams were reviewed to identify

the nurses with most clinical knowledge as scored. Quattrini and Swan (2011) identified that nurses with more than five years of ED experience, showed greater accuracy when determining patients' ED level of urgency.

Data Analysis

Leave Without Any Treatment

This project resulted in a significant impact on the time a patient had to wait to be seen and cared for by a provider. Initial wait times in the ED were 20 minutes from first provider contact; however, with the implementation of the DNP project, wait times from first provider contact with rapid triage decreased by 10 minutes, reducing the LWAT population. The initial project work-flow processes were changed so that patients entered the ED from an urgent and emergent prospective.

Door-to-Decision to Admit

The tracking of trending of data for the patient flow project to improve throughput times showed a significant improvement within a 2-month period. Patients previously were having to wait an additional 30 minutes before the decision to place the patient as an inpatient was decided. TAs noted in Table 2, the facility had set the goal limit for decision to admit to240 minutes. Although the 240-minute goal was not met, the implementation of throughput process changes showed a 30-minute improvement in time from door to decision to admit. The 30 minutes of improved time allowed for more one on one patient care with urgent and emergent patients coming in, freeing up nurses who were once caring for patients who were appropriate for inpatient status. From the frontend, the triage to bed to physician decreased by 3 minutes.

Average Length of Stay

ALOS in the ED was evaluated to determine the degree of overcrowding. The project goals sought to positively impact ALOS in the ED by improving front end processes in which patients were transitioned through the system. Point of care testing for the targeted diagnoses of Acute Coronary Syndrome (ACS) and Gastrointestinal Bleed (GI), helped achieve the goal of decreasing ALOS. The initial goal of ALOS was benchmarked at 150 minutes, however, a significant decrease in the time patients waited in the Ed from departure to designated areas showed a decrease in ALOS form 185 minutes to 162 minutes, which was 12 minutes over goal. The time from care complete (CC) to admit departure in adults was 149 and 133 minutes respectively, with a goal of 60 minutes. In pediatric patients, CC improved from 88 minutes to 78, with a goal of 60. While these goals were not met, improvement in projected admit departing time was demonstrated. With continuation of implemented processes, over time, the project shows a promise in achieving ALOS goal of 150 minutes.

Patient Satisfaction

This project explored the impact changes in patient flow would have on satisfaction in treatment and care (Table 3). Performance comparisons remained the same as last year at 65.5%, however, over the month of December 2017 to January 2018, response distribution remains at the same rate of 52.0%, which was dependent on how much time was spent with patients. Top performers by rank are Courtesy/Respect of Doctors at 73%, Emergency overall Care at 66%, and receiving care within 30 minutes of arrival at 56%; Clear Communication by doctors a t 53.3% and Patient Advocacy at 51%.

Performance over time increased within the first month of Quarter 1 (Q1) increased to 65.6%, up from 59.5%. Top priorities of the project were improving efficiency without compromising quality of care so that the nurses could spend enough time with patients at 82%. Poor performers were, not given as much information as needed at 6% and courtesy/respect of nurses at 7%.

Table 3

ED Performance Metrics and Goals Flow Chart

Metrics	Goal	December 2018	January 2019	Reporting Interval
Door to provider (minutes)	30	28	25	Monthly
Door to discharge (home) (minutes)	140	140	144	Monthly
Door to departure (inpatient) (minutes)	240	332	302	Monthly
CC to admit depart (Adult)	60	149	133	Monthly
CC to admit depart (Pediatric)	150	88	78	Monthly
Overall Turn-around time (TAT) (minutes)	150	185	162	Monthly

Recommendations

Deficiencies in patient flow results in overcrowding that significantly restricts hospital ED's from providing safe, efficient quality care. Excessive patient wait times slows turn-around times and cause delays in disposition decisions. The project findings demonstrated that a change in workflow can result in decreasing Door-to-Decision to Admit, ALOS, and patients who left without being seen. Since data was evaluated for only two months, the first recommendation is to continue data evaluation on a monthly basis for at least four more months.

Richard and Jarvis (2016) suggested improvement in workflow and new technologies such as point of care testing will prevent patient flow deficiencies that result in overcrowding in the ED. The use of rapid triage, doctor to patient contact in triage, streaming non-emergent patients to fast-track ED, technology to assess for emergent

conditions, and POCT, has shown to reduce delays and increase patient disposition to care areas as well as discharge waits. Delays in patient treatment as a result of ED overcrowding should be considered a public health concern and effective processes should be implemented to address the issue. In addition, a process evaluation with the ED staff should be undertaken to explore strengths and weaknesses of the current implementation and seek addition input for improvements.

Strengths

Despite increasing ED volume, the rapid triage and comprehensive assessment improved wait time by 23 minutes. Although the goal of 240 minutes was not met, the patients who needed an inpatient admission were screened, treated, and moved to a designated impatient unit improved by 30 minutes. Collection of historical data of ED flow helped determine factors that significantly contribute to increased wait times and poor patient flow. Determining the gaps in system processes has been key to providing the best practice solutions to an ongoing problem.

Limitations

Limitations included budget restraints that did not allow for any additional staff hires or physical revisions to the ED structure. The data analysis was only for two months. It was unexpected that the volume of the ED patients decreased by 128 in January 2019. The decrease in volume may be contributed to the soft opening of a new free-standing ED built by the hospital to gain more patients from neighboring communities. This decrease could have impacted the actual results for the two months. Support from the literature needed

Summary

Overcrowding in the ED leads to long patient wait times, decrease in safe efficient care, reduced bed capacity, capability of nurses to care for patients, and negatively impact patient satisfaction. Because of these precipitating factors, hospital executives and ED leadership should participate, develop, and implement strategies to alleviate patient flow issues. Implementation of a rapid triage process at the facility not only produced a timely comprehensive assessment, but also reduced wait times, Although implementation of this quality improvement initiative showed promise in creating an efficient flow of patients, the bed capacity of the ED is lacking with only 30 treatment rooms and an area allotted for 12 hall beds for a mid to high volume ED. Discussion of expanding the ED and allowing for different areas for acute and non-acute cases could be beneficial in continued progress toward decreasing identified targets.

Section 5: Dissemination Plan

Dissemination Plan

ED overcrowding has been significant and has had negative impacts on the organization, including long wait times, boarding of admitted patients, patient satisfaction, and patients who have left without care. The intended audience for dissemination of my DNP project will be clinical, nonclinical, and administrative leadership. I plan to disseminate my project in an acute care setting. A PowerPoint presentation will be most effective in gaining the intended audience attention and interest.

Analysis of Self

I have developed both as a professional and as a clinical leader through the completion of my quality improvement project. Assessing gaps and barriers in current clinical processes has afforded me the opportunity to develop and implement strategies that will improve quality in my practice. Moreover, I have developed competence, autonomy, and the ability to relate to change, which is crucial to leadership responsibilities. The project has afforded me the opportunity to work with a team of professionals and to see different aspects of healthcare delivery.

I have also developed my knowledge, which has allowed me to teach other nurses and ancillary professionals the importance of evidence-based practice guidelines and how to translate knowledge into evidence. The tenacity and leadership I have shown throughout this DNP project has reflected positively on the department I am a director of in that half of the team members have received certifications in their area of expertise and/or are seeking higher education beyond their current degree.

Through the completion of my DNP quality improvement project, I have grown professionally in clinical practice and will always look for opportunities to improve quality of care and patient outcomes through evidence-based approaches and guidelines.

Summary

There are crucial factors in organizational systems that contribute to overcrowding and process flow problems in the ED. A vast majority of admissions to inpatient units originate in the ED, leading to overcrowding and staff burdens if patients are not properly processed. Although the project shows promise in transitioning patients safely to designated care areas or discharging patients who are not appropriate for admission, hospitals must be consistent in monitoring and change current practices that affect patient care. To be effective in delivering patient care, EDs must be willing to modify throughput options that lead to overcrowding and may significantly and negatively impact patient care. Improving deficiencies in the ED not only improve care provided but can also restore trust in the community served in a competitive healthcare market. To be successful in implementation of a quality improvement project such as this, hospital executive leadership must be supportive in change processes and ensure that ED clinicians are providing appropriate patient care while utilizing resources effectively. Hospital administrators recognize that a reduction in deficiencies decreases cost and improves reimbursement; therefore, they must continually assess evidence-based strategies to improve patient flow. Adoption of best practice models to improved ED throughput will ease the burden of long wait times and ensure quality and satisfaction in patient care delivery.

References

Agency for Healthcare Research and Quality. (2017). *Safety Culture*. Retrieved from https://psnet.ahrq.gov/primers/primer/5/safety-culture

Akhtar, S., Brouns, M., Wales, D., & Ward, C. (2017). Improving patient flow: Setting up of an ambulatory care unit in Nevill Hall Hospital using the CORE role of the chief registrar. *Clinical Medicine, 17*(3), 18-19. doi:10.7861/clinmedicine .17-3-s18

Arab, M., Movahed Kor, E., & Mahmoodi, M. (2015). The effect of time-to-provider, left-without-treatment and length-of-stay on patient satisfaction in training hospitals' emergency department, Iran. *Iranian Journal of Public Health*, *44*(10), 1411–1417. Retrieved from Walden Library database.

Asha, S. E., & Ajami, A. (2014). Improvement in emergency department length of stay using nurse-led 'emergency journey coordinator': A before/after study. *Emergency Medicine Australasia, 26*(2), 158-163. doi:10.1111/1742-6723.12201

Ashour, O. M., & Okudan Kremer, G. E. (2016). Dynamic grouping and prioritization: A new approach to emergency department flow improvement. *Health Care Management Science, 19*(2), 192-205. doi:10.1007/s10729-014-9311-1

Baker, S. J., Shupe, R., & Smith, D. (2013). Driving efficient flow: three best-practice models. *Journal of Emergency Nursing, 39*(5), 481-484. doi:10.1016/j.jen.2013.02.008

Bodenheimer, T. & Sinsky, C. (2014). From triple to quadruple aim: Care of the patient requires care of the provider. *Annals of Family Medicine, 12*(6), 573-576.

doi:10.1370/afm.1713

Brown, C. G. (2014). The Iowa Model of evidence-based practice to promote quality care: An illustrated example in oncology nursing. *Clinical Journal of Oncology Nursing, 18*(2), 157-159. doi:10.1188/14.CJON.157-159

Centers for Disease Control and Prevention. (2014). QuickStats: Median emergency department (ED) wait and treatment times-by triage level. Morbidity and Mortality Weekly Report. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6319a8.htm

Centers for Medicare and Medicaid. (2018). PDSA Cycle Template. Retrieved from https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/downloads/pdsacycledebedits.pdf

Chartier, L., Josephson, T., Bates, K., & Kuipers, M. (2015). Improving emergency department flow through rapid medical evaluation unit. *BMJ Quality Improvement Reports, 4*(1), 1-5. doi:10.1136/bmjquality.u206156.w2663

Chartier, L. B., Simoes, L., Kuipers, M., & McGovern, B. (2016). Improving emergency department flow through optimized bed utilization. *BMJ Quality Improvement Reports, 5*(1), 1-5. doi:10.1136/bmjquality.u206156.w2532

Emergency Nurses Association. (2017). *ENA topic brief: Emergency department throughout*. Des Plaines, IL: Emergency Nurses Association. Retrieved from https://www.ena.org/docs/default-source/draft-position-statements-for-public-comment/crowding-boarding-pt-flow-draft-position-statement.pdf

Gallagher-Ford, L. (2014). Implementing and sustaining EBP in real world healthcare settings: Transformational evidence-based leadership: Redesigning traditional roles to promote and sustain a culture of EBP. *Worldviews on Evidence-Based Nursing, 11*(2), 140-142. Retrieved from Walden Library database.

Hostetter, M. & Klein, S. (2013). Improving patient flow -in and out of hospitals and beyond. Quality Matters Archive. Retrieved from http://www.commonwealthfund.org/publications/newsletters/quality-matters/2013/october-november/in-focus-improving-patient-flow

Hunsaker, S., Chen, H-C., Maughan, D., & Heaston, S. (2015). Factors that influence the development of compassion fatigue, burnout, and compassion satisfaction in emergency department nurses. *Journal of Nursing Scholarship, 47*(2), 186-194. doi:10.1111/jnu.12122

Institute for Healthcare Improvement [IHI] (2017). Plan-Do-Study-Act (PDSA) Worksheet. Retrieved from http://www.ihi.org/resources/Pages/Tools/PlanDoStudyActWorksheet.aspx

Institute for Healthcare Improvement. (2017). Time from ED to inpatient bed (median). Retrieved from http://www.ihi.org/resources/Pages/Measures/TimefromEDtoInpatientBedmedian.aspx

Institute of Medicine. (2001). Committee on Quality of Health Care in America. Crossing the quality chasm: A New health system for the 21st century. Washington, DC: National Academic Press. Retrieved from http://www.nap.edu/download/10027

Jihan, Q. & Jordan, L. (2014). Quality and performance measurement: National efforts to improve quality of care through measurement development. *American Association of Nurse Anesthetists Journal, 82*(3), 183-187. Retrieved from Walden Library database

Jo, S., Jeong, T., Jin, Y.H., Lee, J.B., Yoon, J., & Park, B. (2015). ED crowding is associated with inpatient mortality among critically ill patients admitted via the ED: Post hoc analysis from retrospective study. *American Journal of Emergency Medicine, 33*(12), 1725-1731. Retrieved from Walden Library database.

Kane, M., Chui, K., Rimicci, J., Callagy, P., Hereford, J., Shen, S., (2015). Lean manufacturing improves emergency department throughput and patient satisfaction. *Journal of Nursing Administration, 45*(9), 429-434. Retrieved from Walden Library database.

Lo, S., Choi., K., Wong., E., Lee, L., Yeung, R., Chan, J., & Chair, S. (2014). Effectiveness of emergency medicine wards in reducing length of stay and overcrowding in emergency departments. *International Emergency Nursing, 22*(2), 116-120. Retrieved from Walden Library database.

Matthews, K.S. & Long, E.F. (2015). A Conceptual framework for improving critical care patient flow and bed use. *Annals of the American Thoracic Society, 12*(6), 886-894. Retrieved from Walden Library database.

Melnyk, B.M., Gallagher-Ford, L., Long, L.E., & Fineout-Overholt, E. (2014). The Establishment of evidence-based practice competencies for practicing registered nurses and advanced practiced nurses in real-world clinical settings: Proficiencies

to improve healthcare quality, reliability, patient outcomes, and costs. *Worldview on Evidence-Based Nursing, 11*(1), 5-15. doi:10.1111/wvn.12021

Morris, J. (2017). *Education and positive social change*. Retrieved from africaeli.org/education-and-positive-social-change/

Prakash, B. (2010). Patient Satisfaction. *Journal of Cutaneous and Aesthetic Surgery*, *3*(3), 151–155. http://doi.org/10.4103/0974-2077.74491

Quattrini, V., and Swan, B. (2011). Evaluating care in ED fast tracks. *Journal of Emergency Nursing, 37* (1), 40-46. doi:10.1016/j.jen.2009.10.1016

Reinhardt, M.R. (2017). A Systematic approach to evaluation of performance deficiencies in ED triage. *Journal of Emergency Nursing, 43*(4), 329-332. Retrieved from Walden Library database.

Richard, P. & Jarvis, E. (2016). Improving emergency department patient flow. *Clinical and Experimental Emergency Medicine, 3*(2), 63-68. doi:10.15441/ceem.16.127

Rotteau, L., Webster, F., Salkeld, E., Hellings, C., Guttmann, A., Vermeulen, M. (2015). *Academic Emergency Medicine, 22*(6), 720-729. doi:10.1111/acem.12688

Sayah, A., Rogers, L., Devarajan, K., Kingsley-Rocker, L., & Lobon, L.F. (2014). Minimizing ED wait times and improving patient flow and experience of care. *Emergency Medicine International, 14*,1-9. Retrieved from Walden Library database.

Schmaltz, R.M., & Enstrom, R. (2014). Death to weak PowerPoint: strategies to create effective visual presentations Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4189377/

Sharieff, G.Q., Burnell, L., Cantonis, M., Norton, V., Tovar, J., Roberts, K., … (2013). Improving emergency department time to provider, left-without-treatment-rates, and average length of stay. *Administration of Emergency Medicine, 45*(3), 426-432. Retrieved from Walden Library database.

Swancutt, D., Joel-Edgar, S., Allen, M., Thomas, D., Brant, H., Benger, J., … (2017). Not all waits are equal: an exploratory investigation of emergency care patient pathways. *BMC Health Services Research, 17*(436), 1-10. doi:10.1186/s12913-017-2349-2

The Joint Commission (2017). Specification Manual for national hospital inpatient quality measures. Retrieved from https://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

Walden University. (n.d.). *Disseminating your research.* Retrieved from https://crq.adobeconnect.com/researchtutorials/default/CONTENT/Disseminating_Your_Research/welcome.html

Wiler, J.L., Welch, S., Pines, J., Schuur, J., Jouriles, N., & Stone-Griffith, S. (2015). Emergency Department Performance Measures updates: Proceedings of the 2014 Emergency Department Benchmarking Alliance Consensus Summit. *Academic Emergency Medicine, 22*(5), 542-553. Retrieved from Walden Library database.

Yarmohammadian, M.H., Rezael, F., Haghshenas, A., & Tavakoli, N. (2017). Overcrowding in emergency departments: A Review of strategies to decrease

future challenges. *Journal of Research in Medical Sciences, 21*(1), 1-9. Retrieved from Walden Library database.