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Evidence-Based Practice Guide and Workflows: Improving Hospital Throughput and Reducing Emergency Department Overcrowding

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EVIDENCE-BASED PRACTICE GUIDE & WORKFLOWS: IMPROVING HOSPITAL THROUGHPUT AND REDUCING EMERGENCY DEPARTMENT OVERCROWDING

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Abstract

Hospitals in the United States are experiencing disruptions to patient throughput. These disruptions create barriers to patients who seek emergent care in the Emergency Department (ED) and who must be moved to hospital inpatient beds after the decision to admit has been made. As a result, patients requiring hospital admission via the ED may have long wait times, which, in turn, contribute to ED crowding and overcrowding. The root causes of ED overcrowding are inefficiencies within the system and the inability of hospitals to meet demand. Although bed capacity on any given unit may not be altered, ED patient's arrival at an assigned unit may be expedited using an evidence-based practice (EBP) guide that can help to establish standardization among the staff who are responsible for such placement. The purpose of this DNP project is to develop workflows and a guide by using EBP to improve hospital throughput. With the improvement of hospital throughput, boarding of patients and ED overcrowding can be significantly reduced and potentially eliminated. The guide will describe cost-effective EBPs organizations can deploy to streamline patient throughput from the ED, enhance hospital patient throughput, and identify methods that ease ED overcrowding. In addition to providing an overview of each selected practice, expected outcomes, and the source of each practice, the guide will also summarize the various processes that have been successful in addressing ED overcrowding and hospital patient throughput. This guide will reflect an interprofessional, collaborative design which can support developing a solution from a systematic approach.

Keywords: Emergency department bed occupancy, ED boarding, ED overcrowding, emergency department care, patient admission, hospital patient throughput.

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I want to add a special dedication to my nephew, Timothy Ryan Harper. I lost you during this time, and I miss you so much. Your loss is devastating. I found strength in the memories you left with us. I love you Ryan.

Table of Contents

List of Figures

Chapter I

Chapter I will provide an overview of the background, problem, significance, purpose, and method of evaluation for the Doctor of Nursing Practice (DNP) project. This author will provide an overview of the U.S. healthcare system, ED overcrowding, and the impact ED overcrowding has on patient safety and quality outcomes. In this section, a discussion on the purpose of this DNP project and a plan for addressing ED overcrowding. Finally, this chapter will present the method to evaluate the intervention.

Background

In the U.S. healthcare system, patients have several points of entry to inpatient care, which include clinics, procedural care, surgical admissions, interhospital transfers, or emergency department (ED) admissions. Common points of entry for many patients are unscheduled admissions or emergent visits via the ED (Salway, Valenzuela, Shoenberger, Mallon, & Viccellio, 2017). However, hospitals in the United States are experiencing disruptions to hospital patient throughput. Disruptions to hospital patient throughput include delays for ED admissions being transferred from the ED to an inpatient unit, patients seeking emergent care are being boarded in the ED, inpatients are facing longer hospitalizations, and more patients are seeking care. These disruptions create barriers to patients seeking emergent care in the ED who are then moved to hospital inpatient beds after the decision to admit is made. As a result, patients requiring hospital admission via the ED may have long wait times, which can lead and contribute to ED crowding and overcrowding. Nationally, ED overcrowding is a concerning phenomenon. Hospitals are challenged with developing processes to effectively provide care for higher numbers of patients seeking services, in the setting of fewer hospital beds, reduced ED capacity,

and patients having longer length of stay (LOS). Patient outcomes, safety, and quality are suffering.

Problem and Significance

On average, in the United States between the years 2011 and 2015, the Centers for Disease Control and Prevention (CDC; 2015) estimated that there were 136.4 million ED visits. Of those ED visits, 14.2 million or 10.4% resulted in hospital admissions. During this same time frame, the number of available hospital beds declined by 3%, and LOS increased by a tenth of a day (CDC, 2015). With ED visits and ED admissions on the rise and the number of hospital beds declining while LOS is increasing, it appears that demand is outpacing supply in the U.S. healthcare system. One consequence of LOS increasing is that patients are being hospitalized for longer periods of times, which can result in delays for those who are admitted through the ED and who require inpatient beds.

The ED is designed to triage, treat, and stabilize unanticipated patients seeking emergent care. When the care of the patient in the ED does not support a safe discharge, the patient may require hospital admission for inpatient care. An order to admit is followed by a search for an inpatient bed where the patient can be best treated. In a highly efficient patient throughput process, the patient would receive an inpatient bed assignment and be transferred to their assigned room without delay. When ED crowding or overcrowding is present, a patient awaiting an inpatient admission may be left in the ED, which then impacts the care of other patients seeking emergent treatment.

Causes of inefficient patient throughput. Hospital patient throughput is a complex and elaborate process that requires a system-wide approach. Hospital patient throughput is the movement of patients into the hospital (e.g., admissions), movement of patients out of the

hospital (e.g., discharges), and movement of patients within the hospital (e.g., transfers). The process of admitting, discharging, and transferring patients between inpatient units or within the same inpatient unit affects bed availability and can slow patient flow from the ED. Components of the system require optimization. For instance, admissions should be reviewed from all points to determine whether there is a more efficient process so that admissions can be evenly spread across each day of the week, timely discharges can occur, and LOS goals can be met. If patients are not discharged in a timely manner, patients requiring hospital admission from the ED may experience delays in arriving to an inpatient unit, which can contribute to the ED being over capacity. When the ED is over capacity, boarding inpatients, or overcrowded, operationalizing a plan to decompress the ED is the primary focus to promote patient safety throughout the hospital.

Factors that can lead to ED overcrowding. Hospitals being at or over capacity leads to inpatient admissions being boarded in the ED. Salway et al. (2017) have estimated that an average delay of 6.5 hours occurs between the patient's arrival to the ED and admission to the patient's assigned unit when patients are admitted for inpatient care. When there is a delay in a patient's arrival to the inpatient unit, the ED boards admitted patients and provides care until the inpatient unit can receive the patient or until the patient can be discharged from the ED. Admitted patients boarding in the ED is one of the chief drivers of ED overcrowding (Salway et al., 2017). Patients boarding in the ED ultimately results in longer LOS, which further burdens the ED (Salway et al., 2017).

The lack of inpatient beds can also contribute to ED overcrowding. Blom, Jonsson, Landin-Olsson, and Ivarsson (2014) found a negative correlation between inpatient bed occupancy and patients being admitted from the ED. This finding indicates that a substantial percentage of patients requiring inpatient care are not admitted during high occupancy times.

Also, patients are sometimes subjected to unnecessary inpatient admissions from the ED during times when hospital occupancy is low (Salway et al., 2017). In one study, Rathlev et al. (2014) established a positive association between ED overcrowding and high inpatient bed occupancy. This finding suggests, when inpatient beds are filled, ED overcrowding is more likely to occur.

When hospital patient throughput is slowed or stopped, the ED may begin boarding admissions, and then the ED can become overcrowded. This fact demonstrates why patient throughput requires a system-wide process to coordinate care within the institution and community. Placing patients involves a complex set of events that are designed to ensure patients are assigned to the unit that best meets their level of care needs as ordered by the provider. Clinical coordination is essential to ensure patients arrive on the best unit for their condition. When the inpatient units, ED staff, and physicians are unsure of the level of care, barriers to admission occur, resulting in delays in patient throughput.

Increasingly, patients are held in the ED until a more specific diagnosis and appropriate placement are identified. At other times, a lack of communication between departments can lead to a lack of availability of beds. Communicating when critical care units are at capacity helps the system to be creative and reach out to other hospitals. An essential step in unblocking inpatient throughput is to be proactive and transfer ED boarders to inpatient hospital beds within the community that may have available beds. The patient placement team is responsible for ensuring that all patients requiring inpatient stays are assigned beds. When the hospital is reaching capacity, the team communicates the status of hospital capacity to critical stakeholders to ensure a plan is established to meet the demand for the provision of safe patient care.

According to Baker and Esbenshade (2015), inpatient boarders are one of the major contributing factors to the ED overcrowding experienced in hospitals nationwide.

ED overcrowding presents significant quality and patient safety risks, and the lack of inpatient bed capacity or bed availability is only one of many factors associated with that overcrowding. Minimally, the ED must screen and provide care/treatment for all patients who enter the ED. ED overcrowding occurs when numbers of patients exceed the capacity of the ED. When the ED is over capacity, patients may be placed in undesignated spaces within the ED while awaiting treatment; ED patients may experience longer than expected wait times to be seen by a provider. Some patients may choose to leave without being seen due to the extended wait times, and adverse outcomes are more likely to occur in such cases (Baker & Esbenshade, 2015; Blom et al., 2014; Salway et al., 2017). The root causes of ED overcrowding are inefficiencies within the system and an inability for hospitals to meet demand. According to Salway et al. (2017), evidence-based practices (EBPs) that improve ED overcrowding and promote efficient hospital patient throughput include smoothing of elective admissions, early discharges, increasing discharges on weekends, and utilization of a protocol when the hospital nears full capacity. These EBPs effectively foster hospital throughput, reduce delays for hospital admissions for those seeking inpatient care, and combat boarding of patients in the ED.

Purpose

The purpose of this DNP project is to develop an EBP guide that supports improvement in hospital throughput. By improving hospital throughput, boarding of patients in the ED and ED overcrowding can be reduced or eliminated. This EBP guide pinpoints cost-effective EBPs that organizations can deploy to streamline patient throughput from the ED. It is anticipated that utilization of the practices identified therein will promote patient safety, improve quality of care,

reduce ED boarding time, increase patient and staff satisfaction, and enhance efficiency around patient placement. This project also analyzes the cost and efficacy of implementing practices that support more efficient admission of ED patients. This project aims to identify practices that optimize hospital throughput and streamline efficient placement options for ED admissions, with the goal of producing an EBP guide that will improve patient throughput on a systems level, thus impacting ED patient flow to inpatient units. An EBP guide can also establish consistency among staff members who are responsible for ensuring patients in the ED arrive at an assigned unit as the result of an efficient process. The guide can help facilitate an organization's proactive approach to mobilizing resources that can ensure actions are taken to reduce delays to ED admissions during volume surges. Finally, the guide also can be used to explore other options to maintain hospital throughput.

Method of Evaluation

The method of evaluation will be determined by measuring times for specified hospital patient throughput metrics. These times will be extracted from the electronic medical record (EMR) which has been determined to be the source of truth for this DNP project. Development of the EBP guide focuses on adult patients who have ED inpatient admissions orders. The guide incorporates EBPs to streamline admissions from the ED and enhances hospital-wide patient throughput, communication strategies, and a scorecard to measure performance. A scorecard is a record used to measure performance or progress toward a goal. For this project, the scorecard will be a chart used to measure monthly progress during the fiscal year. The evaluation will begin with identifying the organization's current hospital patient throughput by measuring the time frame between the ED admit order to the time of the patient's arrival to an inpatient bed in minutes, the ED admit order to the time the patient's inpatient bed is assigned, and ED boarding

time in hours. The successful implementation of the intervention requires the engagement of inpatient and ED nurse leaders, physicians, case management staff, and an executive leader as a sponsor.

This guide includes solutions to patient throughput issues, a cost analysis of implementation, and a communication method developed to use when the facility is approaching saturation. The communication method can be used to alert critical stakeholders on the current state of inpatient volume, expected discharges, expected admissions, and ED volumes. The desired outcomes are a reduction in the time from the ED admit order to inpatient bed assigned and ED admit order to the patient's arrival to an inpatient bed. When these reductions are achieved, there may also be a reduction in ED boarding hours.

Chapter II

Chapter II will address the literature and needs assessment. This chapter will also offer further elaboration of the cost, quality, and sustainability of the DNP project. The EBPs and themes to address ED overcrowding and hospital patient throughput will be reviewed in this section. Lastly, this chapter will review options to sustain the DNP project.

Literature Review

Inefficient hospital patient throughput not only hampers patient movement within the hospital, the inefficiencies can also place a burden on bed capacity within the ED resulting in boarding of admitted patients and ED overcrowding. Although the ED is designed to provide emergent care to patients, during periods of boarding and overcrowding, delays in care occur. Inefficient hospital patient throughput diminishes patient safety and quality outcomes. Below is a review of the literature that identifies the reasons and causes for ED overcrowding and best practices that can combat barriers to hospital patient throughput and ED overcrowding.

ED overcrowding results when inpatient beds are not available for patients requiring admission from the ED. Healy-Rodriguez et al. (2014) identified ED overcrowding is one of the leading barriers to emergency care being delivered promptly. There is clear and convincing evidence that ED overcrowding has a positive association with delays in care, poor patient and quality outcomes, increased morbidity and mortality, longer LOS, increased cost, and medical errors (Driscoll, Tobis, Gurka, Serafin, & Carlson, 2015). In the ED, overcrowding decreases bed capacity, negatively impacts the ability to respond to predictable patient volumes, and diminishes safety, quality, and patient satisfaction. Rathlev et al. (2014) found that a lack of inpatient capacity resulted in ED crowding. In 2014, the Centers for Medicare and Medicaid Services (CMS) began to connect reimbursement to ED patient throughput performance. With the impact

that ED throughput could have on hospital reimbursement, optimizing hospital patient throughput will ensure ED throughput meets CMS performance standards.

Nolan, Fee, Cooper, Rankin, and Blegan (2015) found that a "major cause of ED overcrowding is boarding" (p. 62). Boarding admitted patients in the ED has proven to pose a significant risk to quality outcomes for patients and employees. Nationwide, some hospitals have decreased their inpatient and ED bed capacity, while LOS, ED visits, and ED admissions have increased. These factors are contributors to ED overcrowding and result in boarding. According to Baker and Esbenshade (2015), "boarding patients in the ED is the root cause of overcrowding" (p. 65). One study suggests that an average of 11% of all ED patients are boarded (Nolan et al., 2015). Boarding can lead to declines in ED performance. One study found "hospitals that improved patients' flow from the ED to the inpatient units (≤ 2 h) achieve better patient satisfaction and reduce inpatient LOS" (Haq, Stewart-Corral, Hamrock, Perin, & Khaliq, 2018).

Boarding patients in the ED is a hospital-wide throughput problem that must be addressed with a systems approach. Collaboration between ED and inpatient leaders is an essential component in addressing ED overcrowding. Driscoll et al. (2015) found that departmental silos within the inpatient units and ED created capacity issues, which resulted in communication and collaboration gaps between units. These gaps created more instances in which patients could not be sent to the primary units where they would receive optimal care (Driscoll et al., 2015). Also, silos meant fewer opportunities for inpatient units to work together to develop a plan to meet patient volume demands. A significant change was noted in the Driscoll et al. (2015) study when the information was provided to the inpatient units; staffing strategies could be designed to plan for admissions, and a proactive arrangement was made to transfer and discharge patients. Driscoll et al. (2015) recommended developing a validated

method for improving communication and collaboration within the healthcare team to promote patient throughput and to enhance patient safety. Also, as noted by Rathlev et al. (2014) in findings from a pilot study: "failures in communication can significantly impact a hospital's bottom line" (p. 690).

Best practices to address ED overcrowding. Best practices have been identified to reduce ED overcrowding. These include the implementation of a hospital-wide throughput committee, which advances each inpatient unit's proactive participation in actionable goals to manage throughput effectively (Baker & Esbenshade, 2015). Inpatient throughput committees can recommend practices such as inpatient bed huddles, which involve participation of inpatient unit leaders, ED leaders, and the leaders from the multidisciplinary team. The bed huddles primarily focus on developing a plan for timely discharge of patients, identifying and mitigating barriers to discharge, fostering discharge rounds, and preventing delays in admissions and discharges. The bed huddles improve overall hospital patient throughput.

In studies of organizations, several best practices have been identified that promote hospital patient throughput. Best practices should be monitored and reinforced such as rounds that focus on facilitating discharges, a workflow where the inpatient units are responsible for moving patients from the ED known as pulling patients, full visibility of all available beds, elimination of all practices that promote available beds being hidden, and implementation of a centralized bed control or patient placement. In highly efficient organizations, a bed huddle occurs in the afternoon, during which the inpatient teams, ED staff, physicians, and leadership gather to discuss discharges, expected admissions, available beds, and any barriers to discharge that may exist. In addition, the afternoon bed huddle provides an opportunity to reexamine the plan of action established previously, review the outcomes of the team's actions, and determine

the need to escalate to members of the multidisciplinary team to resolve barriers (Baker & Esbenshade, 2015). It is at the bed huddle that plans are developed to ensure that patient throughput is addressed. According to Baker and Esbenshade (2015), during times of high patient volumes, highly efficient "organizations move their inpatient bed huddles to the ED to generate urgency in patient transition and to facilitate inpatient leader rounding" (p. 69); the researchers also emphasized the necessity for organizations to recognize patients boarding in the ED as a hospital patient throughput issue rather than one centered on the ED.

Rathlev at al. (2014) found the use of a Patient Placement Manager (PPM) was an effective method to ensure patients are accurately placed. The PPM, a registered nurse with a clinical background and special training, was able to effectively manage patient flow and open the lines of communication to reduce flow stoppage. However, the PPM structure was reliant on communication by phone, and, at times, delays resulted when providers were not able to connect with the PPM. The PPM is structured on interprofessional collaboration as the PPM must engage with members of the multidisciplinary team to work through the process of placing patients.

Walker, Kappus, and Hall (2016) conducted a systematic review of the literature on EBPs that support improved patient throughput, discovering that, although ED overcrowding is recognized as a patient throughput issue, it is actually an organizational issue, and not just localized to the ED. Quality, patient satisfaction, and patient safety are critical to effective healthcare leadership and organizational performance. CMS and The Joint Commission on Accreditation of Healthcare Organizations (referred to as The Joint Commission and abbreviated here as TJC; 2012) recognize patient throughput as an indicator of quality. TJC identified the national hospital inpatient quality measures for the ED as the following: (a) median time for ED arrival to ED departure for admitted ED patients and (b) time of ED decision to admit decision to

time admitted patient leaves the ED. Alignment of reimbursements with quality indicators is a catalyst for organizations to seek a systematic approach to addressing patient throughput. Walker et al. (2016) recommended more research utilizing a systematic approach to remedy organizational patient throughput problems.

Best practices to address quality outcomes. ED overcrowding results in patients being placed throughout areas in the ED, where space is limited. In many hospitals, inpatient boarders are left in the ED to await an available bed. Viccellio et al. (2013) found that patients waiting in the ED for admission to the inpatient units prefer placement in hallway beds on the inpatient units. One organization cited in the study, an organization in New York, moved 2,000 patients waiting in the ED to inpatient hallways; researchers found that patients were safe, experienced higher patient satisfaction, and had reduced LOS. In addition, patients in hallway beds on the inpatient unit receive full inpatient care and services not consistently offered in ED environments. Although patients experience higher levels of safety and satisfaction when placed in hallway beds on the inpatient units, this practice is not widespread.

Inpatient leader rounding (ILR) optimizes inpatient leader presence by rounding on inpatients boarding in the ED (Baker & Esbenshade, 2015). The inpatient leader's role is to listen to the patient's concerns and provide reassurance that the healthcare team is working to move the patient from the ED to an inpatient unit. ED and inpatient leader collaboration cultivate partnerships in managing ED overcrowding (Baker & Esbenshade, 2015). ILR promotes patient throughput by engaging leaders in addressing the barriers that may exist. ILR has been shown to expedite the patient's movement to an inpatient unit.

Best practices to address efficiency. When hospitals are experiencing ED overcrowding, it is essential that patient throughput is efficient and overcomes the barriers that

could slow or stop patient flow. When nurses are busy, patient flow could be slowed. Admitting patients from the ED can place a strain on nurses who have a patient assignment on the inpatient unit. Simmons and Goldschmidt (2014) examined a team structure known as the staff without assigned territory (SWAT). As a strategy, it increased the efficiency of patient admissions when the nursing staff and the units are busy. The SWAT team supported the organization by ensuring that admitted patients received the information needed to decrease anxiety and promote a safe environment; they were also instrumental in admitting patients despite the primary nurses being busy with discharges and other tasks. Also, the number of changes in bed assignments after patient admission decreased, as the SWAT team reviewed bed assignment and roommates for appropriateness before the patient arrived in this assigned bed.

Patients who are boarding in the ED experience delays in inpatient treatments, which result in poor outcomes for patients. According to Lateef et al. (2017), "a prolonged ED stay has been associated with suboptimal patient outcomes, including higher mortality rates, longer length of hospitalization, higher risk of acquiring infections, and delays in definitive care such as antibiotic administrations for infections" (p. 2). When the hospital is at capacity, ED boarders could spend their entire hospital stay in the ED. Studying an effort to provide quality care for ED boarders, Lateef et al. (2017) studied an acute medical team (AMT) composed of inpatient general medicine physicians, senior and junior medicine residents, and ED nurses trained in inpatient care. This team provided inpatient care to ED boarders who would not be assigned a bed within 2 hours of the ED admit order. ED boarders were admitted to a virtual ward, which provides these patients with access to services provided to inpatients (Lateef et al., 2017). These patients had higher rates of early discharge, reduced LOS, lower cost when compared to patients physically admitted to the inpatient units, and were more likely to be admitted to the unit that

best met their condition. Lateef et al. (2017) also found improved patient outcomes and resource utilization in the group of patients treated by the AMT; further, the AMT model was found to be sustainable in the organization that was studied.

Literature review conclusion. This review of the literature has shown that inefficient patient throughput is a catalyst to significant overcrowding in the ED and presents a substantial hurdle for the prompt delivery of care to ED patients. The research points to poor communication and silos as factors that contribute to having inpatient boarders in the ED and diminished patient throughput. The EBPs shown to improve patient throughput include establishing a patient placement team, instituting practices that promote early discharge and increasing the number of discharges on the weekends, and development of a full-capacity protocol. The literature supports these EBPs that have been shown to promote efficiency such as the SWAT team and the observation unit models. Including leadership in addressing disruptions to patient throughput such as ILR can also help ensure patients receive an inpatient bed faster and fosters collaborative efforts between the ED and inpatient staff. Positive performance can increase patient and staff satisfaction, reduce ED overcrowding, and improve hospital patient throughput.

Needs Assessment

Currently, in this author's urban community hospital, 47% of ED patients with an ED admit order are assigned to a bed within 15 minutes of the order being entered. Of the patients assigned a bed within 15 minutes, 35% of ED patients are admitted to their assigned bed within 60 minutes. The LOS for inpatients is not meeting goals established by the organization. The goal is 3.4 days and actual LOS is 4.8 days. Some high-acuity ED boarders have spent more than 72 hours in the ED before being assigned a bed on the inpatient unit. New strategic goals have

been set to improve ED patient throughput and LOS across the organization. Improving throughput from the ED represents a local organizational improvement project to meet and exceed the quality outcomes and the strategic goal.

Population identification. The population for this improvement project will be composed of all adult ED patients being admitted to the intensive care unit (ICU) and a progressive care unit (PCU). ED patients are assigned to the ICU and PCU where they receive more specialized clinical interventions, provided by trained clinicians, in an environment designated to provide specialized treatments. When these patients are boarded in the ED, other patients presenting for treatment may experience delays in care. In addition, ICU and PCU patients boarding in the ED experience increased mortality (Healy-Rodriguez et al., 2014; Salway et al., 2017). Patients boarding in the ED experience delays in treatment as well.

Identification of key stakeholders. Key stakeholders include ED and inpatient leadership teams and the patient placement team. Participation of the ED physicians and hospitalists is essential to the development of practices that improve patient throughput. Case management staff members are also key stakeholders in this performance improvement project. The frontline nursing staff members are both key stakeholders and decision makers. Lastly, members of the executive leadership team are stakeholders in sustaining successful change throughout the organization.

Organizational assessment. An organizational assessment has revealed an organization that appears to be chaotic. Quality metrics such as patient satisfaction, employee engagement, and hospital throughput have declined over the last 18 months. Strategic goals for patient satisfaction have not been achieved, and the organization is currently in the midst of a turnaround. This turnaround process may have resulted in the departure of multiple leaders from

the organization. Nonetheless, EBPs have not been foundational to the care provided. This can be changed as "transformational nursing leadership drives organizational change and provides vision, human and financial resources and time that empowers nurses to include evidence in practice" (Hauck, Winsett, & Kuric, 2013, p. 664). Currently, the organization is ready to support this performance improvement project and is seeking opportunities to sustain the change. Nurse leaders are uniquely positioned to prepare the frontline for the adoption of change.

Scope of the project. The scope of this project is the development of an EBP guide with an implementation plan for the future. The guide identifies EBPs that support improved hospital throughput and the reduction of ED overcrowding and boarding, offering information on specific EBPs, tools, and resources needed; a workflow to operationalize the identified EBP; and discussion that provides an overview of the strategy. Organizations differ; thus, this guide is a starting point and is not intended to address all organizations. This guide does lay out EBPs in a simplified format, which provides access and visibility.

Future enhancements would include EBPs with an in-depth cost analysis of each measure, as well as a model for implementation, and evaluation of effectiveness. As organizations seek to reduce cost, a guide for effective deployment of EBP that is not cost prohibitive is crucial. An outline of instruments necessary to effectively operationalize new practices will be part of future enhancements. Lastly, scorecards for visual management will also be included. Organizations can also adjust the scorecard to measure current performance against past performance. See example of scorecard in chapter IV.

Cost. Currently, the patient placement team is made up of designated staff categories. An RN is staffed for 16 hours per day at a rate of $90/hour or $43,200/month. A nonclinical clerk position is staffed 24 hours per day at an average rate of $32/hour or $23,040/month. In the

redesign, the RN hours will be expanded to cover 24 hours per day. The average cost of RN and clerk support per month would be $64,800 and $23,040, respectively. Annualized, the cost would be $777,600.

In the United States, it is estimated that building a single hospital bed costs $1,000,000, whereas staffing that same bed costs $600,000 to $800,000 (Salway et al., 2017). A more cost-effective measure to overcome ED overcrowding would involve reducing hospital LOS and improving hospital throughput. Salway et al. (2017) estimated that increasing or decreasing one ED admission per day could net the hospital approximately $800,000 per year. Improving hospital throughput offers an excellent opportunity to maximize revenue for organizations and to reduce expenditure waste. These strategies would also pay the labor cost of redesigning the patient placement team.

Research is needed on the costs of resources used when patients are boarded in the ED. Lateef et al. (2017) found that the cost of caring for patients boarded in the ED and treated by the AMT team was less than the cost of caring for inpatients admitted to the hospital unit. The costs of boarding an inpatient in the ED are directly associated with the expenses the hospital charges and are not increased relative to the patient boarding in the ED. Expenses that require additional examination are the costs associated with lost revenue related to patients who require transfers to other hospitals and costs associated with increased LOS due to ED overcrowding.

Walker et al. (2016) reported that a hospital in Ohio cut $70 million of waste by improving patient throughput; hospital throughput was enhanced by using Lean Six Sigma methods of mapping processes to focus on “frontline staff and physician engagement to change the culture,” thus redefining “milestones of the patient throughput project with daily feedback on metrics” (p. 286). This organization also experienced a 41% increase in nurse retention, achieved

a perfect score on CMS core measures, and reduced readmissions and LOS. Although the cost associated with the change was not provided, the savings are assumed to far outweigh the expense of implementing practices that improve hospital throughput.

Quality. Healthcare organizations are being challenged to improve quality and patient safety to enhance reimbursements. TJC has identified inefficient patient throughput as an indicator of poor-quality outcomes and has established standards that must be achieved (Walker et al., 2016). This performance improvement project has been developed with a primary focus on quality improvement and patient safety. One quality metric that was measured was the time span between ED decisions to admit (ED admit order) to ED departure (arrival at inpatient room), measured in minutes. The effect on ED boarding hours can be monitored and measured to determine effectiveness. Adverse events such as patients being assigned to the improper level of care, patients arriving at the inpatient unit before the bed is available, patients requiring transfer to higher level of care within 60 minutes of inpatient admission, and other adverse events related to patient placement can be measured to determine whether the strategies identified in the guide meet organizational needs. The balancing measure—patient satisfaction—can be analyzed to determine the effectiveness of the newly designed EBP guide and to weigh the impact. TJC and CMS established nonclinical measures to monitor patient throughput to lead organizations to understand that ED overcrowding is severely impacted by hospital patient throughput, and adverse quality outcomes can be improved when a systems solution is established. TJC created a benchmark of 4 hours for patients boarding in the ED; however, after feedback from organizations, this benchmark is no longer in use. Instead, TJC recognized hospital throughput is the most significant driver of boarding and ED overcrowding. As such, TJC (2012) has

implemented standards, which state that "leadership will use data and measures to identify, mitigate, and manage issues related to hospital-wide throughput" (p. 2).

Sustainability. Continuous improvement would suggest an evaluation of the strategies identified in the guide to enhance efficiencies, ensure that the latest evidence supports current practices, and evaluate the adoption of and adherence to the EBPs. As the strategic goals are developed, approved, and disseminated, nurse leaders and their teams will align quality metrics with performance metrics. Nurse leaders can then develop processes to measure progress against the goal. Sustaining this new practice will require daily assessment and monitoring.

Chapter III

This chapter will provide an overview of the theoretical underpinnings. A change model that supports making small test to determine effectiveness of changed will be reviewed. Organizational change will be addressed. A conceptual framework will be introduced. Lastly, barriers to change will be discussed.

Theoretical Underpinnings

Kurt Lewin's Force Field Analysis theory describes how to effectively manage organizational change (Shirey, 2013). In this theory, opposing forces are characterized as the driving and restraining forces. These forces work against each other to perpetuate equilibrium or the current state, also known as the status quo. According to Lewin, "change can be enacted in one or two ways: by increasing the force for change in the desired direction or by reducing the strength of any opposing forces" (as cited in Borkowski, 2016, p. 359). This DNP project proposes the development of an EBP guide designed to increase the force for change in the desired direction by identifying EBPs that have been shown to improve hospital patient throughput and to reduce ED overcrowding. Figure 1 (Kurt Lewin's Force Field Analysis) illustrates the force of change growing with the implementation of the EBPs and the development of a standardized workflow. As the force of change increases, the opposing force (or the status quo) decreases or is overcome.

Change Theory and Theoretical Underpinning

The change theory selected to facilitate this quality improvement project is Edward Deming's plan-do-study-act (PDSA) cycle. The PDSA cycle is a scientific approach to implementing small changes. The steps are merely planning for a change, doing the change, comparing actual to expected results, and spreading the change, or adjusting as needed to meet

the intended goals (Kellogg, Gainer, Allen, O'Sullivan, & Singer, 2017). This project requires planning and using the PDSA methodology test of change (TOC) process, which provides for effective changes within a measurable time frame. The strength of the PDSA cycle is that it allows for the real-time application of the workflow developed in the EBP guide, which gives rise to rapid cycle change, implementation, and continuous improvement. Limitations of the PDSA cycle are that time frames are short, and change is rapid, which could contribute to elements of the change not being thoroughly operationalized. Although PDSA is a reactive approach, there is an extensive planning period associated with the model. Figure 2 is a depiction of Edward Deming's PDSA cycle as described in Kellogg et al. (2017) with adaptations by this author to fit the DNP project plan for implementation. Figure 2 illustrates the PDSA cycle as a continuous process whereby progressive change is planned, implemented, evaluated, and accepted or adjusted as needed. As a continuous cycle of change, the PDSA offers an opportunity for organizations to actively engage in the planning and implementation of practices, which provides an opportunity to actively work through a change to determine the impact.

Kurt Lewin's Force Field Analysis are two opposite and contrasting forces that are working for or against organizational change. The driving forces are those forces seeking a change and the restraining forces are the status quo. According to Shirey (2013), change occurs when the driving forces are exerted and can overcome the status quo. Figure 1 demonstrates how the driving forces exert change by moving beyond the restraining forces.

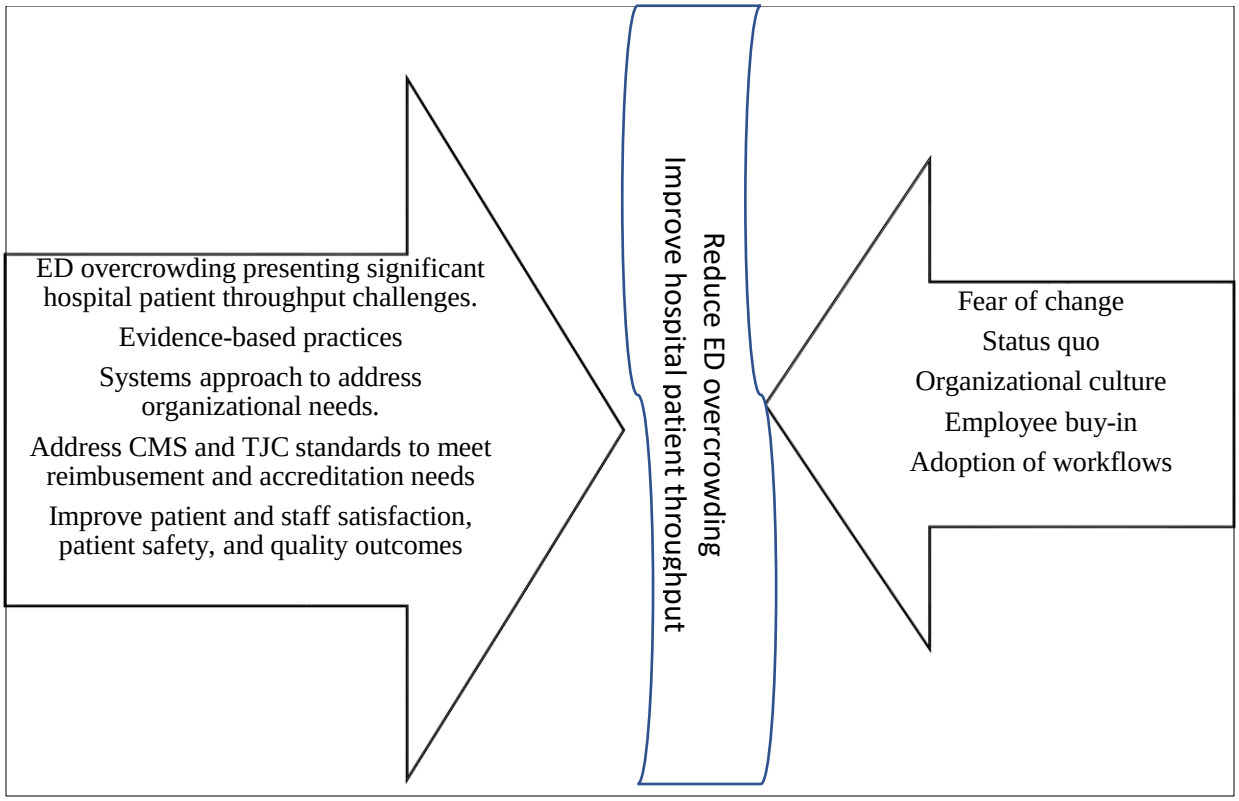

Figure 1. Kurt Lewin's Force Field Analysis. This has been adapted to illustrate the application to the theoretical framework of the DNP project to facilitate change. CMS, Centers for Medicare and Medicaid Services; ED, emergency department; TJC, The Joint Commission.

Deming's PDSA cycle provides a scientific model by which transformation can be achieved by conducting a small test of change (TOC). The TOC promotes an opportunity for continuous improvement and adjustments during the implementation phase of the EBP guide. The force of EBPs and the need to change hospital throughput to improve patient flow is the motivation for this DNP project. PDSA and Force Field Analysis are both models through which change can be accomplished and when combined provides an opportunity for greater success by addressing cultures that can defeat change. In this project, these models will be utilized to be better facilitate a structured process for change.

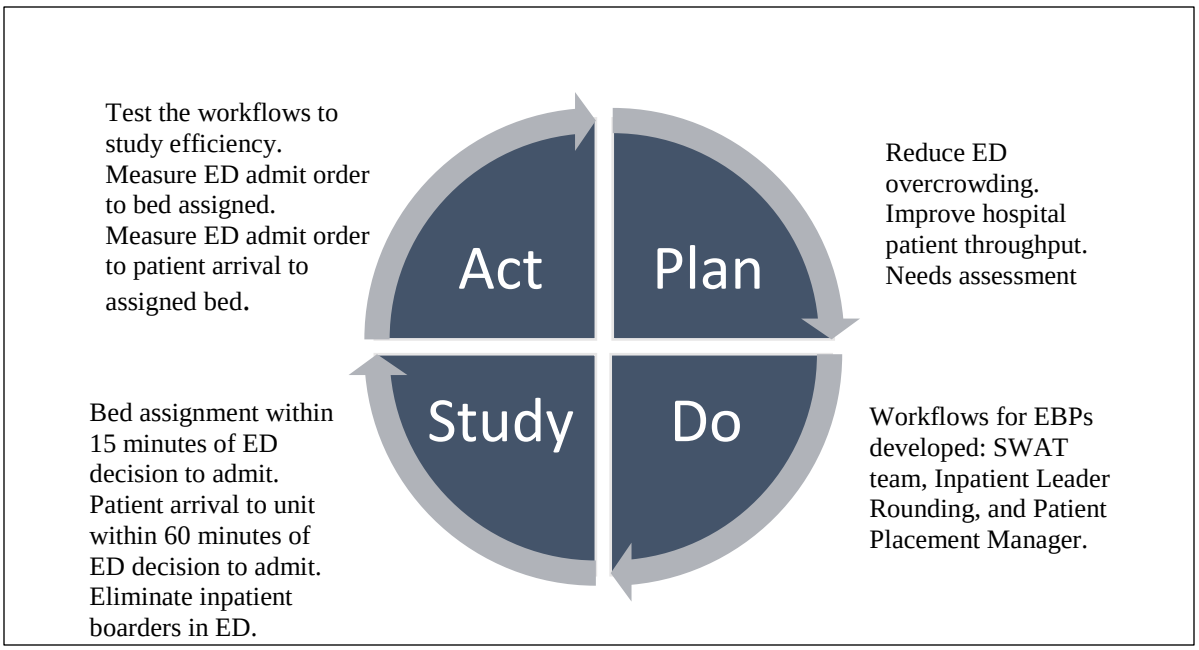

Figure 2. Edward Deming's PDSA Cycle. As applied to reducing ED overcrowding and improving hospital patient throughput using EBPs. This image reflects the PDSA cycle as described by Kellogg (2017) and adapted to reflect the implementation of EBP to improve hospital patient throughput.

Conceptual framework

In the conceptual framework created by this author, Kurt Lewin's Force Field Analysis is used to illustrate how the status quo or resistant forces within an organizational culture can resist change. The resistance is illustrated by the red arrow with solid black line which represents the factors that resist change. The green arrows represent the driving forces that support the change. The green arrows are permeable, interact with the organizational culture, and exerts the forces of change, in this case, the EBPs on the organizational culture. As the driving forces overcome the status quo, the equilibrium is upset, and change occurs. The green circles represent some expected outcomes of the changes that occur as the status quo is disrupted. The ED and inpatient units are linked along with the EBPs to represent the separate cultures in each area that need to

be upset. The three EBPs selected are representative of the workflow this author created to promote a system's approach to improving hospital throughput. Figure 1 illustrates the linkage the existing cultures, introduction of EBPs and the expected outcomes. The Patient Placement Manager has been shown to improve ED overcrowding by reducing ED LOS by over 10% and lateral transfers. The SWAT team was found to improve efficiency by transporting patients from the ED to the inpatient unit, relieving the inpatient nurses of the burdensome task of admitting patients from the ED. The ILR has been shown to improve patient satisfaction and expedites the patient's arrival to an available bed. This conceptual framework illustrates how each EBP promotes efficient patient throughput. In addition, the conceptual framework demonstrates how the status quo creates blockages to patient throughput from the ED. Conversely, implementation of EBPs promote efficient placement of patients by permeating the status quo and to drive change.

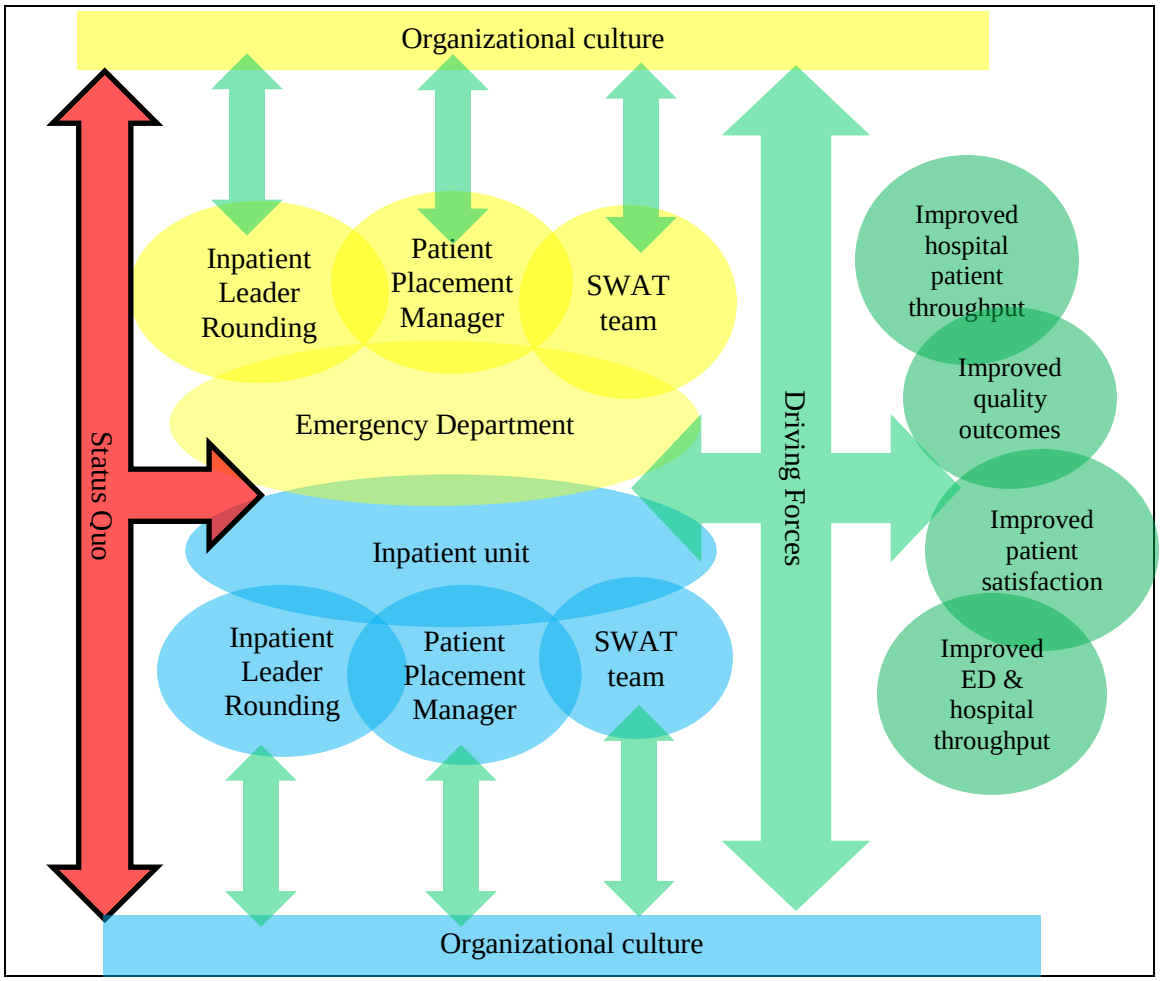

Figure 3. Halley's Conceptual Framework. This schematic demonstrates the driving forces overcoming the status quo and cultural barriers for successful implementation of EBPs.

Barriers to Change

The most likely barriers to successful implementation and sustainable change are staff resistance and change of culture. Establishing changes in attitudes and work habits takes a commitment of time and effort. Some strategies that can help reduce staff resistance are taking time to educate and re-educate staff, providing leadership support through transparent communications, and reinforcing the change with positive messaging (McHugh, Van Dyke, McClelland, & Moss, 2014). Buy-in from frontline staff, leaders, physicians, and executive sponsorship is undeniably

critical for the attainment of organizational change (Hauck et al., 2013). Feedback and engagement of frontline staff can support successful implementation and sustainability. Providing more information brings about more opportunities to survive the change and advance professionally in a continually changing environment.

A barrier to change includes the idea that ED overcrowding is an issue isolated to the ED. Leaders must realize the importance of ED overcrowding and the impact on patients, staff, and the organization. They must also understand that ED overcrowding is a systems issue that deserves a systems response to develop and operationalize a solution. Given the proper platform, organizations can begin to take steps toward eliminating ED overcrowding and improving hospital throughput with the support of their teams.

Cost can be a barrier to change and can lead organizations to take shortcuts or decide not to move forward with implementation. A well-laid out plan must address cost and analyze the risks and benefits associated with implementing the change. Predictable quality outcomes associated with implementing EBP can be used to analyze benefit versus risk. Although upfront cost should always be a consideration, the final determination to move forward is best made when all the information on a quality improvement process can be thoroughly reviewed and assessed. The return on the up-front investment should be considered but cannot always be the determining factor, especially when patient safety and quality may suffer.

Chapter IV

Chapter IV will address the project plan, population of interest, measures, instruments, and activities. The timeline, risks and threats, evaluation plan, and SWOT analysis will be reviewed. Workflows designed using EBPs will be introduced. This chapter will present tools, resources, and a discussion for each workflow.

Project Plan

Patient safety and quality of care are the factors that this project seeks to enhance. This project also aims to add to the knowledge base of healthcare practitioners to assist in establishing standard work and education to improve placement of ED admissions, especially in the face of surges in ED and inpatient volumes. The plan for this project was to develop an EBP guide that comprises methods associated with improving hospital-wide patient throughput and reducing ED boarding and overcrowding. This guide identifies EBPs shown to create these results and outlines practices that promote efficient hospital-wide patient throughput, providing an overview of selected EBPs, expected outcomes, and the source of each EBP. It was designed to provide visibility to processes that have been successful in addressing ED overcrowding using a systematic approach and designed to be used to compare pre-intervention and post intervention data on assessing the time at which the decision to admit is made in the ED and the ED departure time for admitted patients. Further, stakeholders will require education as an essential and critical step to complete dissemination of the EBP guide and workflows. Appendix A in the appendices provide a list of EBPs designed to improve hospital patient throughput and produce quality outcomes.

Expert evaluation of the EBP guide is planned as part of the approval process. Experts chosen to critically review the guide have experience in healthcare leadership, with exposure to

hospital throughput and organizational leadership. Optimizing throughput and hospital resources are goals of the standardized guide; thus, expertise in clinical, academic, and organizational leadership is essential for the critical review of this guide. A written evaluation was requested from each expert.

Population of interest. This EBP guide is designed to provide practices that support improving patient throughput in the adult patient population. All adult ED patient admissions with ED admit orders to the ICU and PCU are within the scope of this project plan. Hospital throughput impacts all admissions, discharges, and transfers within the hospital. Hospitals, both public and private, could benefit from utilization of the guide to make improvements to patient throughput and reduce overcrowding and boarding in the ED. The population of interest in this study provides for a small TOC that can be spread to all adult inpatient units if it is shown to be successful.

Measures, instruments, and activities. The following are the performance measures used to determine the effectiveness of the EBPs identified in the guide: (a) the time from ED admit order until ED departure to inpatient room (measured in minutes), (b) ED boarding (measured in hours), and patient satisfaction (measured using data from the Hospital Consumer Assessment of Healthcare Providers and Systems [HCAHPS] survey). Instruments needed are computers and the EMR, portable phones, and software for extraction and analysis of data. Activities that promote dissemination of performance measures to stakeholders include daily huddles and monthly meetings of the hospital-wide throughput committee. A scorecard, also an essential part of the guide, was developed and used to provide a visual measure for performance.

Timeline. The timeline reflects the development of the guide; however, the guide's implementation is out of the scope for the DNP project. The timeline began in August 2018 with

a review of the barriers to hospital-wide patient throughput. The development of the guide began in September 2018 after a full assessment of barriers. Meetings were held with nurse leaders in the inpatient units and ED to discuss the best metrics to measure for performance. An expert evaluation of the EBP guide was completed in January 2019. The EBP guide will be provided to all key stakeholders.

Risks and threats. The reality that boarding and overcrowding in the ED are components of hospital-wide patient throughput issues poses risks and threats to this guide because implementation of the guide and remedy of the boarding and overcrowding problems will require a systematic approach. Some long-term employees are highly invested in current practices which are inefficient and contribute to poor patient outcomes. Failure to secure physician and provider buy-in may pose a distinct threat to this project, as changing the current workflow for discharges and admissions is not possible without their buy-in and participation. If hospital-wide throughput is going to be optimized, interprofessional collaboration is essential. Such collaboration might be at risk, especially considering that the organization is currently experiencing a massive change within the leadership team. For the guide to be effectively used, full executive leadership support is imperative. Also, failure of buy-in by the frontline is a potential threat to the success of this project. Lastly, CMS is expected to conduct an unannounced survey, which may pose a risk to the implementation of the guide. The focus of the organization is CMS survey preparation. This survey will determine whether CMS will continue to reimburse for care. With the stakes so high, this initiative could be placed on hold.

Plan evaluation. As noted previously, the time from ED admit order until patient arrival to inpatient bed (measured in minutes), ED boarding (measured in hours), and patient satisfaction using HCAHPS data will be used to evaluate the effectiveness of the workflows in

EBP guide. Charts can be used to provide comparative data on pre-intervention and post-intervention state. Another means of evaluating the effectiveness of the project was a survey that measured the patient placement team's adherence to the practices outlined in the guide. The patient placement team was provided an evaluation, which included questions developed on a four-point Likert scale. Completed surveys were managed and stored in an Excel database. Expert evaluation was used as a method to assess the effectiveness of the EBP guide. Random audits will be used to assess compliance with the EBP guide. The "PDSA Worksheet," developed by the Institute for Healthcare Improvement, can be used to determine the effectiveness of the standard work. Standard work is an outline of tasks that can be completed in order to gain consistency and hardwire processes. When processes are hardwired, outcomes are more predictable.

SWOT analysis. To identify the strengths, weaknesses, opportunities, and threats (SWOT) of the guide, a SWOT analysis was completed. The strengths are that the nursing leadership team is engaged, there are physician champions, and there is widespread interest for improving hospital patient throughput. In addition, a weakness of the guide is there are cost associated with the implementation of the EBPs and there are limited resources dedicated to education. Another weakness is there are gaps in communication. The opportunities the EBP guide offers are decreased ED boarders, improved patient throughput, and improvements in patient and staff satisfaction. The threats are employee buy-in to implementation of the EBP guide, education will be costly, and competing organizational priorities could pose barriers to the success of the EBP guide. Appendix B provides the details of the SWOT analysis that was completed.

Discussion. ED boarding and overcrowding are symptoms of inefficient hospital-wide patient throughput. Regulatory agencies, specifically CMS and TJC, recognize boarding and ED overcrowding as threats to patient safety and delivery of quality care. Although there are limited studies that specifically discuss the costs associated with inefficiencies in hospital-wide patient throughput, research has shown that improvements in throughput are linked to improved patient safety and quality outcomes. Developing a systematic approach to organizational change can ensure sustainable practices for long-term and successful change.

This EBP guide provides an outline of five practices and models that have been shown to positively impact hospital throughput and reduce ED overcrowding. It also offers information pertinent to organizations that may be interested in discovering opportunities that will reduce ED overcrowding and blockages to patient throughput. In addition, it identifies the tools and resources required to operationalize the practices and develop workflows for each, workflows that show the practical application of each EBP. This guide endeavors to create a new practice using some of the selected EBPs. Table 1 provides an overview of some of the practices that were used to develop the EBP guide.

Observation Unit Model

The observation unit model has been shown to improve patient satisfaction and decrease LOS in the ED. Patients were admitted from the ED to the observation unit 10 minutes faster than patients who are going to an inpatient unit. Over a 4-month timeframe, there was an improvement in patient satisfaction as evidenced by the HCAHPS scores in the following categories: (a) would recommend (increased by 30%), (b) communication with physicians (increased by 32%), (c) overall rating (increased by 26%); (Plamann & Zedreck-Gonzalez, 2017). An observation unit can improve hospital throughput by providing a treatment area for

patients who require additional treatment and are not ready to be discharged from the ED. Admission criteria can be determined by a single diagnosis or patient population, or the observation unit can be a multi-diagnosis unit. The success of the observation unit model can be optimized by establishing explicit inclusion and exclusion criteria, the ability of the unit to off-load patients from the ED, and the unambiguous determination of criteria for patient transition to discharge or admission to inpatient status. Developing these criteria requires interprofessional collaboration and coordination. Communication of inclusion and exclusion criteria is vital to the success and proper utilization of the observation unit.

Organizations that are considering the observation unit model must contemplate the cost of such a unit, the number of beds needed, the best location or area, observation unit leadership, and physician coverage. There must also be consideration for the setup of the nursing station and patient room in addition to the bathroom style (shared or private). CMS and the state health department may regulate the use of observation units in the acute care setting; ensuring that the observation unit meets regulations is essential prior to its use for patient care. The observation unit is not appropriate for patients requiring ICU level of care.

The observation unit model provides an opportunity for patients to be stabilized and to receive care and treatment while the staff members manage overuse of inpatient hospital beds. A population of patients that has been identified as using the observation unit model successfully includes those who have received a diagnosis of heart failure. The observation unit model provides an option for patients to receive short-term management such as diuresis while hospital beds are reserved for patients who require more resources and longer hospitalizations to manage their ailment. As noted by Zsilinszka, Mentz, Eapen, Pang, and Hernandez (2017), “Identifying the patients that qualify for an observation unit setting or are safe for discharge is a key first step

to reduce unnecessary admissions" (p. 331). Appendix C provides an overview of the observation unit model.

Tools and resources. The observation unit model needs technological enhancements such as the EMR. The EMR provides information on the patient's current condition and treatment course, which can be used to communicate the patient's disposition while in the observation unit. If the patient requires inpatient admission, the EMR provides documentation of the patient's current treatment options and informs the care needed as the patient transitions from observation to inpatient status. Best practice is that the EMR utilized for the observation unit is integrated throughout the hospital and the system, which promotes accessibility of the patient's medical information for the care team.

Resources necessary for the operation of the observation unit include RNs trained in providing acute care for patients who require various treatments, including telemetry monitoring. The observation unit must also be staffed with case management staff, social services staff, and physicians/providers. Other required resources include phlebotomy services, dietary staff, therapies, imaging, and environmental services. Also, equipping the observation unit with commodes, wheelchairs, walkers, medication storage, and distribution technology is essential to functional capacity. The observation unit must also have designated space to safely maintain patients' personal belongings. The area should also have the capacity to support telephone, wireless, and television services.

Workflow. The workflow of the observation unit begins with ED admission orders being received for patients who could require a hospital stay of 24 to 48 hours. Depending on the care the patient needs, the observation unit may provide a better option for care and discharge than an inpatient unit. After the ED admit order is entered, the physician/provider and the patient

placement team will determine whether the patient care needs are within the parameters for the observation unit (the patient being able to ambulate safely to the bathroom, no contact precautions, expected discharge within 24–48 hours, no restraints, safe discharge plan). Patients would be assigned to the observation unit up to the unit's capacity. The physician/provider documents the expected date of discharge in the EMR. Case management will monitor the patient's progress and maintain communication with the physician/provider. If the patient requires additional treatment after 24 to 48 hours, the patient must be admitted to an appropriate inpatient unit, with the case management staff updating the patient's classification from observation to inpatient status. An admit order is entered, and the patient is assigned to an inpatient bed. When the bed is available, the patient will be transferred to the inpatient bed.

Discussion. The observation unit model provides a designated area or location for patients who require further treatment beyond the scope of the ED. Operating the observation unit model provides options for improved hospital throughput by treating patients who may not require utilization of an inpatient bed. The practices in the observation unit must align with patient's level of care. Documentation must reflect observation status, and discharge criteria must be established to provide patients with a safe discharge plan. One advantage of the observation unit is that it can reduce readmissions, as observation patients do not meet admission standards as set by CMS. It can also offer a designated area for patients who have not met discharge criteria from the ED, which, in turn, provides for better ED throughput and decreases LOS in the ED. The observation unit model provides an option for patients to receive care on a short-term basis and leverages hospital beds and other resources for patients who require longer hospital stays or more intensive treatment modalities. In addition, the observation unit model facilitates hospital patient throughput by creating a separate path for treatment for patients who

require short-term management. The observation unit model also reduces ED overcrowding and delays in care.

SWAT Team Model

ED overcrowding can result when the flow from the inpatient units is slowed or stopped. Many organizations task nurses with admitting and discharging patients. The process of accepting patients from the ED can be placed on hold until the receiving nurse sets aside time to devote to admitting patients, but, when receiving nurses have competing priorities, delays can occur. Further, the admission process can disrupt safe patient care for those nurses assigned to receive patients from the ED. Nurses perceive admissions as contributing to disturbances in their workflow due to the unpredictable nature of ED admissions (Jennings, Sandelowski, & Higgins, 2013). Further, Simmons and Goldschmidt (2014) reported that the admission process significantly compounds the workload of the receiving nurse.

To address barriers to hospital patient throughput, the SWAT team model was developed as an EBP method of facilitating ED admission from the ED, which reduces delays (Simmons & Goldschmidt, 2014). The SWAT team model is composed of a team of two nurses, working 10-hour or 12-hour shifts Monday through Friday; these nurses are focused on facilitating and expediting ED admissions. The SWAT team model provides coverage across shift change and during the busiest times for patient admissions from the ED. The foundation of the SWAT team model is to provide resources to facilitate patient throughput.

The SWAT team is responsible for completing the admission process. In the SWAT team model, when nurses are deployed to complete the admissions process, the receiving nurse can continue to focus on assigned patients on the unit. This model reduces interruptions, improves the efficiency of the admission process, and promotes patient safety by deploying nurses who are

devoted to admitting patients from the ED to the inpatient unit. The SWAT model also provides support to the ED by way of nurses transporting patients, which allows the ED to continue to move patients through the process.

Tools and resources. The SWAT team model is best supported when integrated with technology that optimizes efficiency. Many organizations use the EMR, which is used to prioritize admissions from the ED, assign patients to the admitting unit, and communicate pertinent information related to patient care for ED admissions. Portable mobile phones that provide a means for two-way communication are also required. Having mobile phones optimizes the SWAT team's mobility and increases the responsiveness of the SWAT team.

The SWAT team model is not a resource-heavy option, which makes this an attractive alternative. Resources required are RNs who are not assigned to other areas; this offers flexibility and mobility for the RNs to move within the organization to better meet patients' needs. The SWAT team model may benefit from having access to transport equipment such as wheelchairs, carts or gurneys, and transport monitors, which would dictate the need for a secure storage area to safely maintain equipment when not in use and to ensure that equipment is readily available when needed.

Workflow. The SWAT team maintains communications with the ED charge nurse and inpatient charge nurses. When a patient receives ED admission orders, the SWAT RN is introduced to the patient before the SWAT mobilizes transfer of the patient from the ED to the assigned inpatient unit and bed. The SWAT team completes the admissions process on the inpatient unit, introducing the patient to the primary nurse and providing a bedside handoff to that nurse. The SWAT team completes their documentation before moving to the next admission. Figure 3 illustrates an example of the workflow for the SWAT team model.

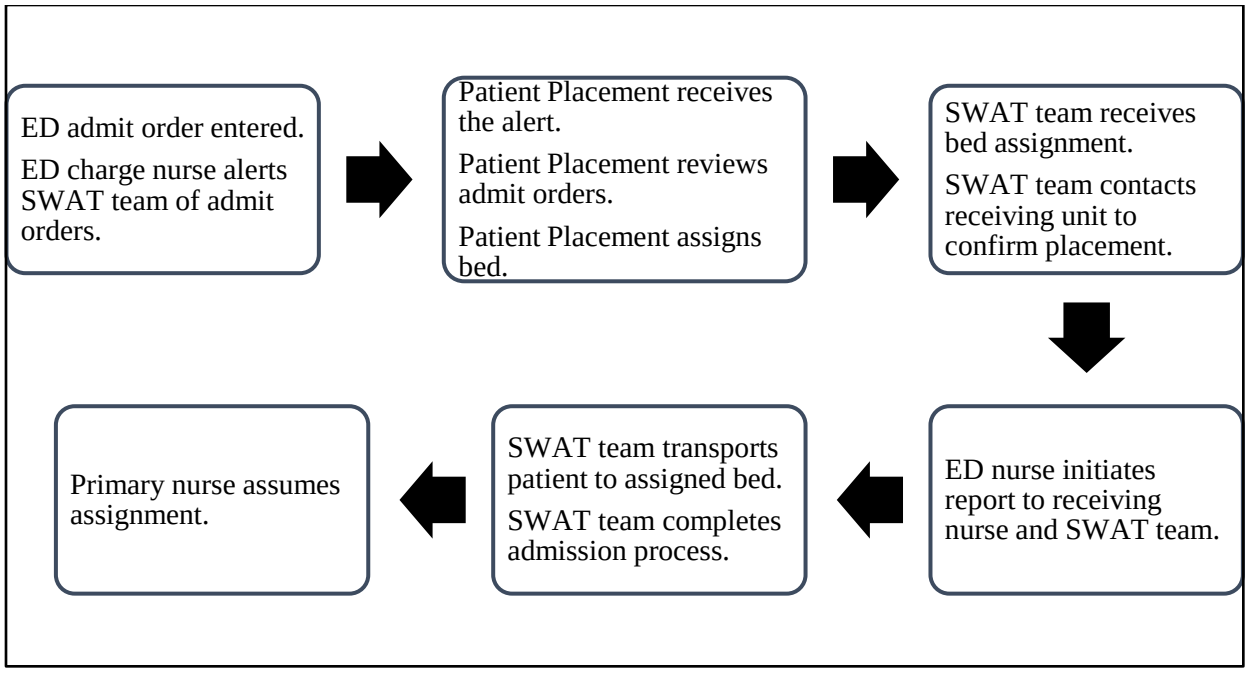

Figure 4. SWAT Team Workflow.

Discussion. The idea behind the SWAT model is to reduce the workload of the receiving nurses by completing the admission process that is time consuming. The SWAT model supports efficiency by facilitating the flow of ED admissions that are driven by the SWAT team and not the receiving nurses who have multiple responsibilities, which compete with the admission process (Simmons & Goldschmidt, 2014). The SWAT team members are dispatched by patient placement and support the inpatient units that primarily have ED admissions. The cost associated with the SWAT model is primarily limited to the labor cost for nurses assigned to the team, mobile two-way communication devices, and any required training in the model.

The SWAT team model is best operationalized by employing RNs who are trained in critical care. Nurses trained to provide critical care will provide maximal flexibility during the admissions process, as there are fewer limitations related to the skill mix required for patients being admitted at a higher level of care. Depending on the needs of the hospital, there

could be consideration for expanding the team to include nurses trained for care of pediatric patients and advanced practice nurses (APRN) who are permitted to work within the full scope of their licensure to maintain flow. According to Simmons and Goldschmidt (2014), the implementation of the SWAT team model that they observed resulted in patient admissions occurring, notwithstanding nurse workload, with the nurses on the unit experiencing a reduction in workload when the SWAT team model was in use. Simmons and Goldschmidt (2014) also found that when the SWAT team was working, the SWAT team transported patients from the ED, and there was a reduction in lateral transfers related to inappropriate bed placement, as well as more efficient process for patient from the ED.

Acute Medical Team

The ED relies on inpatient units to provide care after a patient has been stabilized and identified as requiring additional treatment. In most situations, when a patient is identified as requiring additional treatment, a decision to admit is made, and the search for an inpatient bed begins. ED overcrowding occurs when the flow between the ED and inpatient units is delayed or halted. In many EDs, inpatient care is delayed until the patient moves to an inpatient unit. The AMT model provides an alternative that permits inpatient care to begin within 2 hours of the ED admit order. The AMT is made up of a team of general medicine physicians, residents, medical interns, and an ED nurse trained to provide inpatient care.

Tools and resources. As previously noted, the design of the AMT model includes physicians, nurses, residents, and interns. Organizations may consider adding an APRN as a cost-effective method, which also promotes high-quality outcomes. The APRN could function as an extender for the physician and focus on promoting flow by ensuring that patients are safely discharged or transferred to an inpatient unit if further treatment is required. The AMT model

calls for the use of EMR technology that is designed to assign virtual units and beds, which is vital as virtual assignment enables full inpatient services to be associated with the patient. The organization should also consider where these patients will be located to make their assignment more geographically convenient and to allow them to be easily found by those providing services including meal delivery, phlebotomy services, and emergent care.

Workflow. The workflow begins with the ED admit order. Patient placement receives the order and begins the search for a bed. During times when hospital throughput is slowed or stopped and patients with ED admit orders are not assigned to an inpatient bed within 2 hours of the ED admit order, the AMT is contacted. The AMT is staffed with physicians, residents, medical interns, and ED nurses trained to deliver inpatient care. The patient placement team assigns the patient to a virtual unit, and inpatient care begins. Patient placement will continue the search for an inpatient bed during the patient's hospital admission while the AMT delivers care to the patient until he or she is assigned to a bed, discharged, or until the patient's condition warrants a transfer to another acute care facility. Critical to the function and implementation of this model is a determination of the patient's level of care and services that can admit to the AMT. Critical care patients would require providers and nurses who are trained to provide such care. Figure 4 illustrates the workflow of the AMT model.

Discussion. The AMT model is sustainable and facilitates earlier implementation of inpatient care for ED boarders who are not assigned to an inpatient unit within 2 hours of ED admit order. The model also eliminates delays to inpatient care that ED boarders usually experience. In the Lateef et al. (2017) study, the patients under the care of the AMT model had a higher rate of early discharges, reduced LOS, and lower cost of care when compared with those who were physically admitted to the inpatient units, and the patients who received AMT care

were more likely to be admitted to the unit that best met their condition. Lateef et al. (2017) also found improved patient outcomes and resource utilization in the group when the AMT model was used. Although the AMT model has demonstrated lower LOS, there was no increase in readmission rates. The AMT model presents a sustainable alternative for ED boarders that ensures patients receive the treatment needed during times when hospital throughput is slowed or stopped.

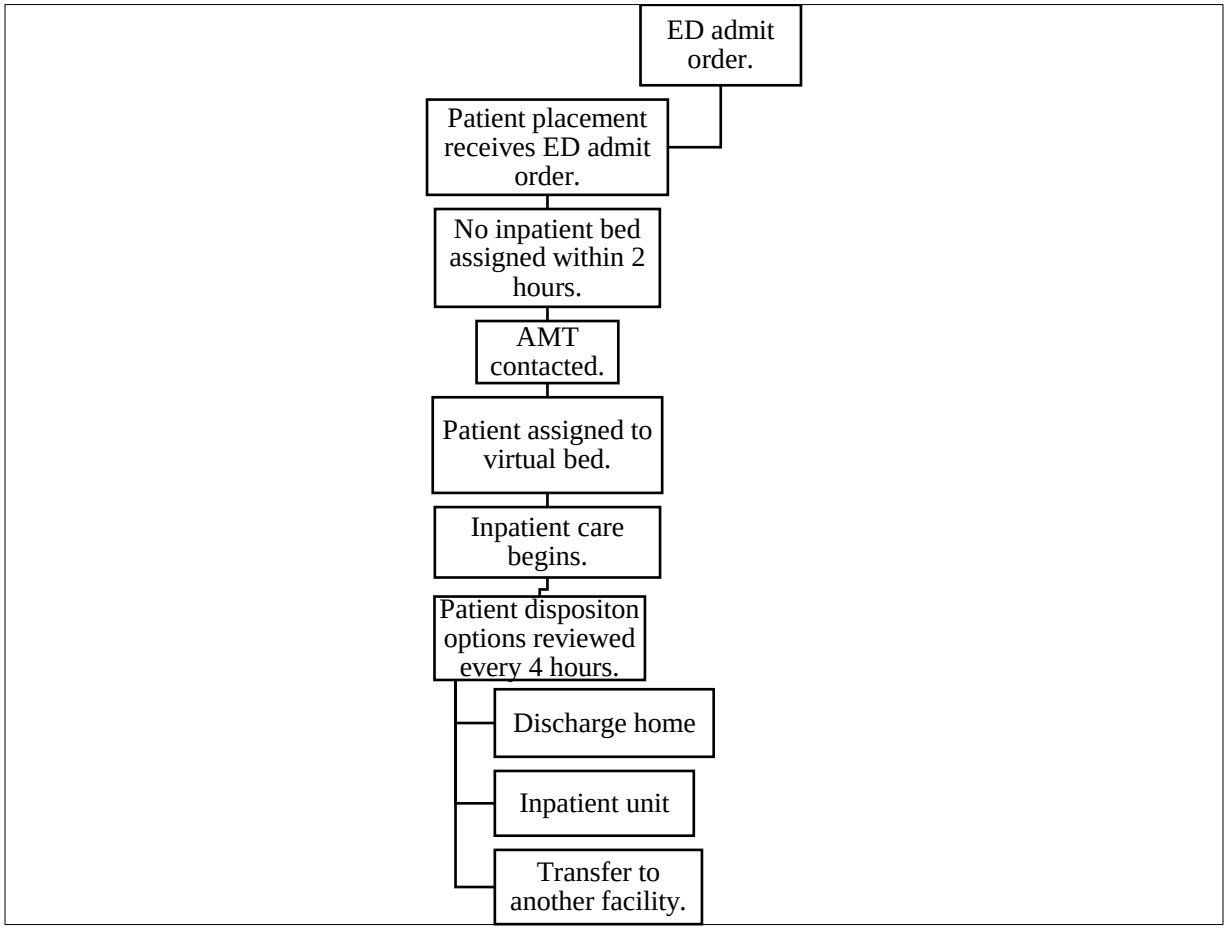

Figure 5. Acute Medical Team Model Workflow. Designed by this author as suggested by Lateef et al. (2017). AMT = acute medical team; ED = emergency department.

Inpatient Leader Rounding

ILR is the process whereby inpatient leaders (e.g., nurse managers, assistant nurse managers, or charge nurses) conduct rounds on patients boarding in the ED. The goals of ILR on ED boarders are to "manage the patient's expectations, ensure service recovery, harvest recognition, and manage up providers, staff, and the organization" (Shupe, 2013, p. 365). The presence of inpatient leaders in the ED supports a collaborative process in which inpatient leaders converge on the ED to learn about the concerns and issues of patients boarding in the ED. ILR in the ED provides inpatient leaders with an opportunity to be engaged in the milieu where ED boarders are being held as a result of slowed or stopped hospital throughput. Inpatient leaders can serve as a catalyst for helping to unblock hospital patient throughput from the ED. During ILR, the goal is to manage up the organization and leaders, listen to any concerns, empathize with the patient, and reinforce with the patient and their family the actions that are being taken to move them to the inpatient unit as soon as a bed is available. ILR on patients has been shown to build trust, reduce anxiety, and provide the leader a sense of responsibility for the patient boarding in the ED.

Tools and resources. Tools and resources required for ILR are the following: a device that can easily track data for abstraction and enhance consistency among inpatient leaders, a communication board to identify patients boarding in the ED and to document ILR, business cards to leave with the patient, and a commitment from inpatient leadership to follow through on this practice. Inpatient leaders may benefit from a tool that facilitates the rounding process. Such a tool, the AIDET (i.e., Acknowledge, Introduce, Duration, Explanation, and Thank You) was developed by the Studer Group as a form of communication designed for use in healthcare. Appendix D was adapted from information provided by the Studer Group to offer a template of

how to use AIDET to conduct leader rounding on patient boarding in the ED. This method requires a commitment from the leadership team to round on every patient who is boarding in the ED.

Workflow. Each week, an inpatient leader is designated to complete rounding on ED boarders. During nonbusiness hours and hours when leadership is out of the medical center, the house supervisor is designated to round on ED boarders. Daily, the leadership is informed of the results of the ILR and the interventions that were implemented to resolve issues and concerns brought up during rounding. Inpatient leaders may use AIDET as a tool to perform consistent inpatient leader rounds on patients boarding in the ED.

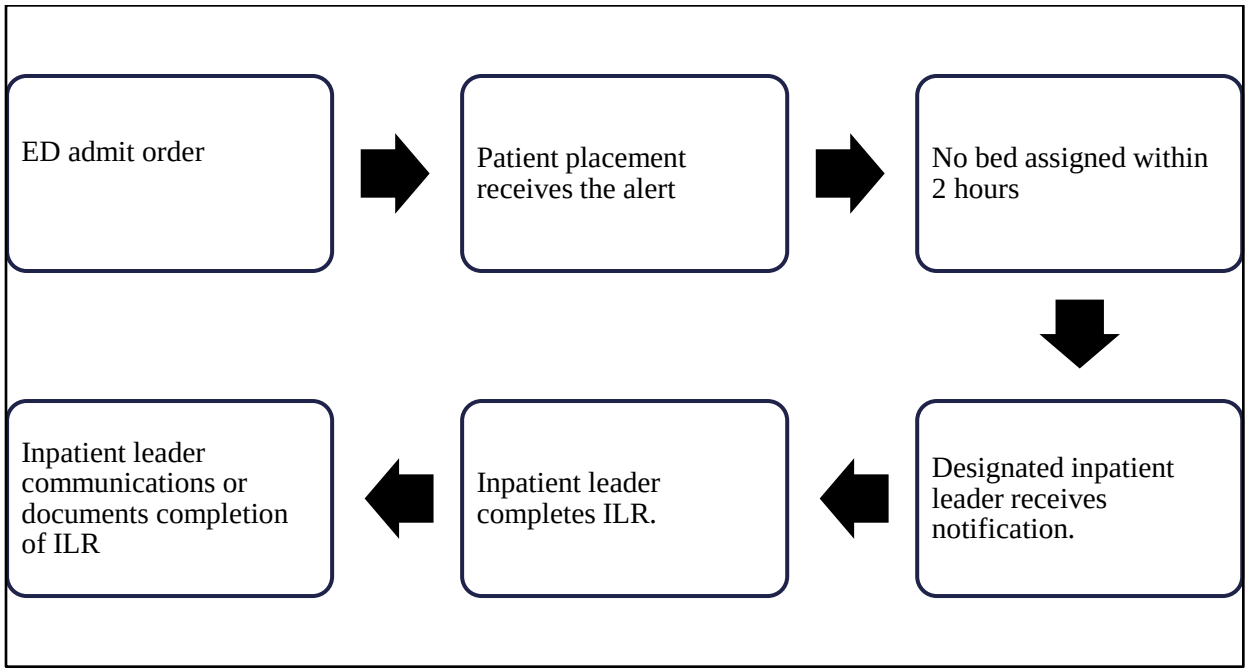

Figure 6. Inpatient Leader Rounding Workflow. ED = emergency department; ILR = inpatient leader rounding.

Discussion. Baker and Esbenshade (2015) found that ILR improved patient experience, helped to increase transition from the ED to an inpatient unit, and improved the collaboration

between ED and inpatient leaders. ILR has also been shown to improve patient safety and quality outcomes (Baker & Esbenshade, 2015). When considering how to maintain patient satisfaction during times of ED boarding, it is essential that implemented tactics are sustainable and that they provide measurable outcomes.

Patient Placement Manager

The Patient Placement Manager (PPM) is an RN trained in the specific criteria for each area within the hospital that admits patients for a minimum of an overnight stay (Rathlev et al., 2014). In the PPM model, the ED doctor and the hospitalist engage in a three-way call in which patients' needs are communicated, and a determination of best placement is made. The PPM focuses on efficiently admitting patients by aligning available beds with patient demand. For the PPM, an available bed is a staffed bed. The PPM maintains an overall view of all beds in the hospital and connects patients to available beds. The PPM also works closely with leadership to ensure staffing levels are appropriate to maintain hospital throughput.

Tools and resources. The PPM uses communication technology to manage hospital throughput efficiently. Tools essential to the PPM are mobile phones, a bed management system, and the EMR. The ED and the operating room are the two areas from which most of the hospital inpatient admissions originate. Consequently, the PPM must maintain open communication with the ED, the operating room, and the inpatient units. Also, in this model, training of the PPM must be thorough and include the intricacies of staffing to facilitate hospital patient throughput and to reduce flow stoppage. Organizations must consider whether the demand for admissions dictates one PPM or more and how many hours per day the PPM will be staffed to direct admissions. As members of the leadership team with an extensive nursing background, PPMs could be cross-trained to function in other areas of the organization.

Workflow. The workflow begins with the ED decision to admit. The ED physician, admitting physician, and the PPM discuss the patient to determine the best placement. A placement decision is made, and the admitting physician enters admit orders. The PPM assigns the patient to an available bed in a unit where the nurses are skilled in meeting the patient's care needs. A nurse is assigned to the patient, and a report from the ED RN to the inpatient RN is initiated. When that report is completed, the patient is transported to the receiving unit. In addition, the PPM maintains visibility and communication with nurse leaders responsible and accountable for hospital patient throughput.

Discussion. The use of a PPM and decision support instruments were found to be effective interventions in ensuring patients were accurately placed. The PPM was able to effectively manage patient flow and open the lines of communication to reduce flow stoppage. However, the PPM structure was reliant on communication by phone, and, at times, delays resulted when providers were not able to connect with the PPM. The PPM model enhances communication, which promotes efficient practices. Rathlev et al. (2014) found that the PPM model reduced ED LOS by 12% and produced a significant decrease ($p < 0.001$) in lateral transfers. Optimization of hospital throughput supports timely and efficient patient flow from the ED, which reduces overcrowding. The PPM must be a skilled communicator and relationship builder. Those relationships will play an essential role in maintaining patient flow. Figure 6 describes a workflow that the PPM could follow.

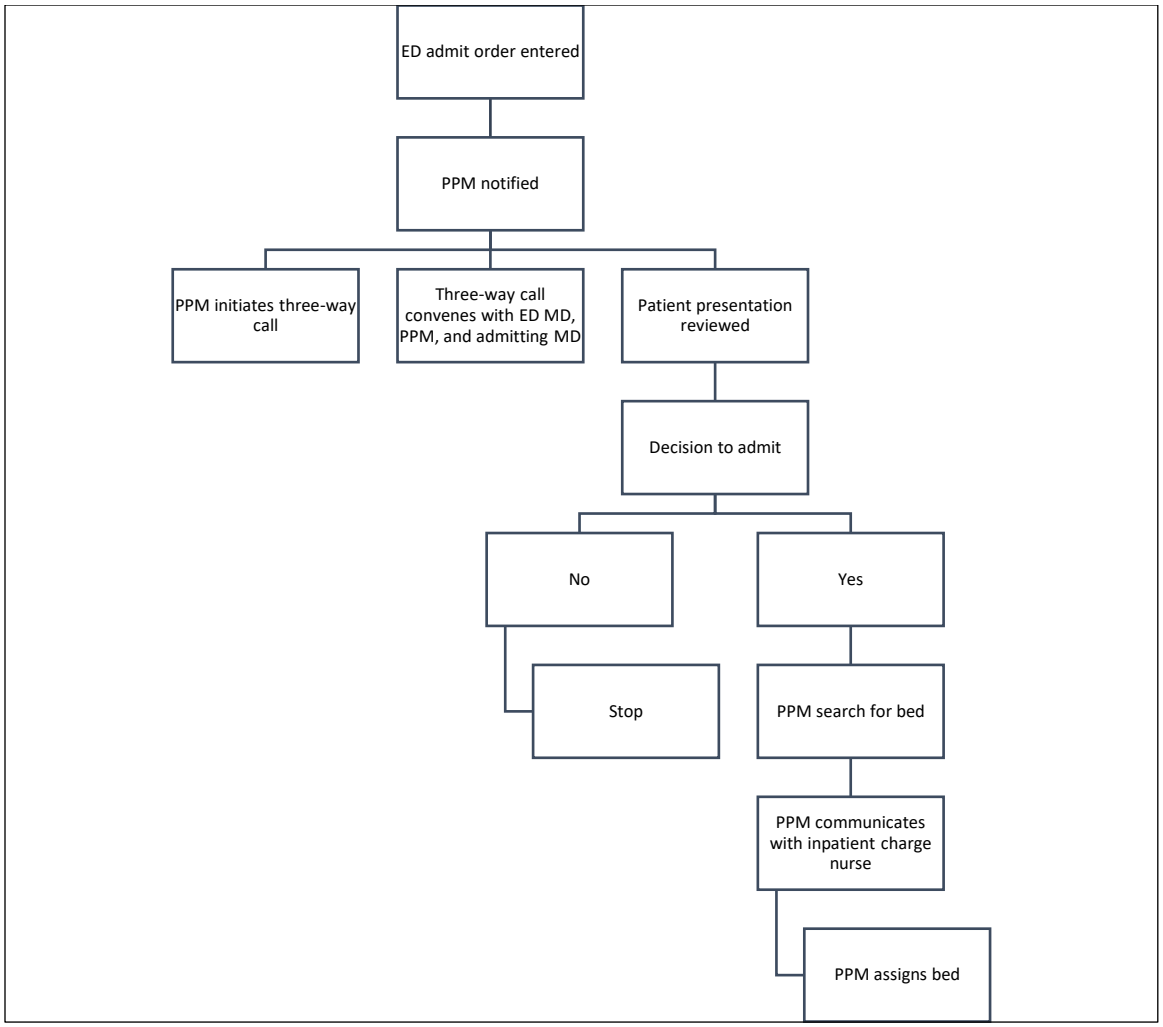

Figure 7. Patient Placement Manager Workflow. ED = emergency department; MD = medical doctor; PPM = patient placement manager.

Chapter V

Chapter V provides an overview of a model that this author developed by combining elements of some of the EBPs reviewed in the previous chapter. This chapter includes tools and resources; a workflow; a recommended implementation plan; and a plan for training. This section will also provide analysis of costs, a method to test for change, and identify measures. A discussion will close this chapter.

Time Minus 60 Minutes Hospital Patient Throughput Model

To optimize hospital throughput and maintain flow from the ED, this author reviewed several EBPs and developed a workflow that incorporates characteristics of the following models: PPM (Rathlev et al., 2014), SWAT team (Simmons and Goldschmidt, 2014), and ILR (Baker & Esbenshade, 2015). What emerged was the Time Minus 60 Minutes (T – 60) Hospital Patient Throughput model, which is fully described in this chapter. The PPM has an essential role for optimization of hospital patient throughput and ED flow. The role of the PPM is to use the EMR to maintain visualization of all hospital beds, coordinate access, and facilitate the flow of patients, ensuring that admitted patients arrive safely in an available bed. In the T – 60 Hospital Patient Throughput model, the function of the PPM is vital and drives outcomes.

The next element of the T – 60 Hospital Patient Throughput model is the SWAT team. The SWAT team does not have an assigned unit and acts as an additional resource that drives efficiencies into the admissions process by owning the admissions process from the time the patient receives an ED admit order until the patient arrives to the assigned bed. Since the admissions process can place a significant burden on inpatient nurses, which in turn puts patients at risk and contributes to slowing or stoppage of hospital throughput, the addition of the SWAT team promotes flow and supports inpatient workflows. The SWAT team model is best leveraged

when the nurses assigned in this role are trained to care for critical care patients. As an additional resource, the SWAT team has the capacity to focus efforts on areas that are most impacted. Working closely with the PPM, ED leadership, and inpatient leadership, the SWAT team plays an essential role within the T – 60 Hospital Patient Throughput model.

Finally, ILR occurs on each ED admission with an ED boarding time of 2 hours or more from ED decision to admit until arrival to assigned bed. ILR is designed to provide communication to patients boarding in the ED. It is essential that ILR is conducted consistently, and Table 2 provides an example of scripting to promote consistency. The goal of ILR is to facilitate placement of patients and to enhance collaboration and communication between ED and inpatient leadership while developing a plan to ED boarders. Leveraging the cross-departmental collaboration supports hospital throughput and keeps inpatient leaders engaged in facilitating flow from the ED.

Tools and resources. The performance of this model is strongly reliant on an EMR with an integration of a highly functional bed placement module. In this model, the PPM is staffed 24 hours per day, 7 days per week. This staffing structure provides consistency and eliminates the practice of altering admission expectations during lower demand times. The SWAT team is also an essential resource in this model. Aligning SWAT team working hours with high-volume admission times will provide additional support to the admitting units and the ED, thus reducing instances of ED overcrowding as ED patients await inpatient unit staff to clear their workloads and prepare for admissions. The foundation of this model is structured around a three-way communication between the PPM, the ED physician, and the admitting physician. Initiation of this communication begins with the ED decision to admit. To facilitate communication, mobile

devices, including phones and tablets with access to the EMR, are required. Devices that are integrated with the EMR allow for notification when the ED decision to admit has been entered.

Workflow. The workflow begins with initiation of the ED decision to admit. The PPM receives a notification and then initiates a three-way communication with the admitting physician and the ED physician, with the expectation that the admitting physician will respond within five minutes of notification of the ED decision to admit. Both physicians and the PPM review the patient's presentation, history, physical, the ED course, and admission needs. A consensus for admission is determined. If the determination is that the patient does not require hospitalization, this workflow ends. If the determination is that the patient needs inpatient hospitalization, the PPM makes a recommendation on where the patient would be best cared for by staff trained to care for the patient and initiates a search for the bed. When a bed has been located, it is assigned by the PPM and the SWAT team, and the charge nurse on the admitting unit receives a notification. The charge nurse assigns an RN to receive the patient. The ED RN initiates a report. The SWAT team arrives at the ED to transport the patient to his or her assigned bed; upon that patient' arrival, the SWAT team completes the patient's admission and provides updates to the assigned RN. Figure 7 illustrates the workflow. This workflow was designed to ensure patients arrive at their assigned bed within 60 minutes of ED admit order.

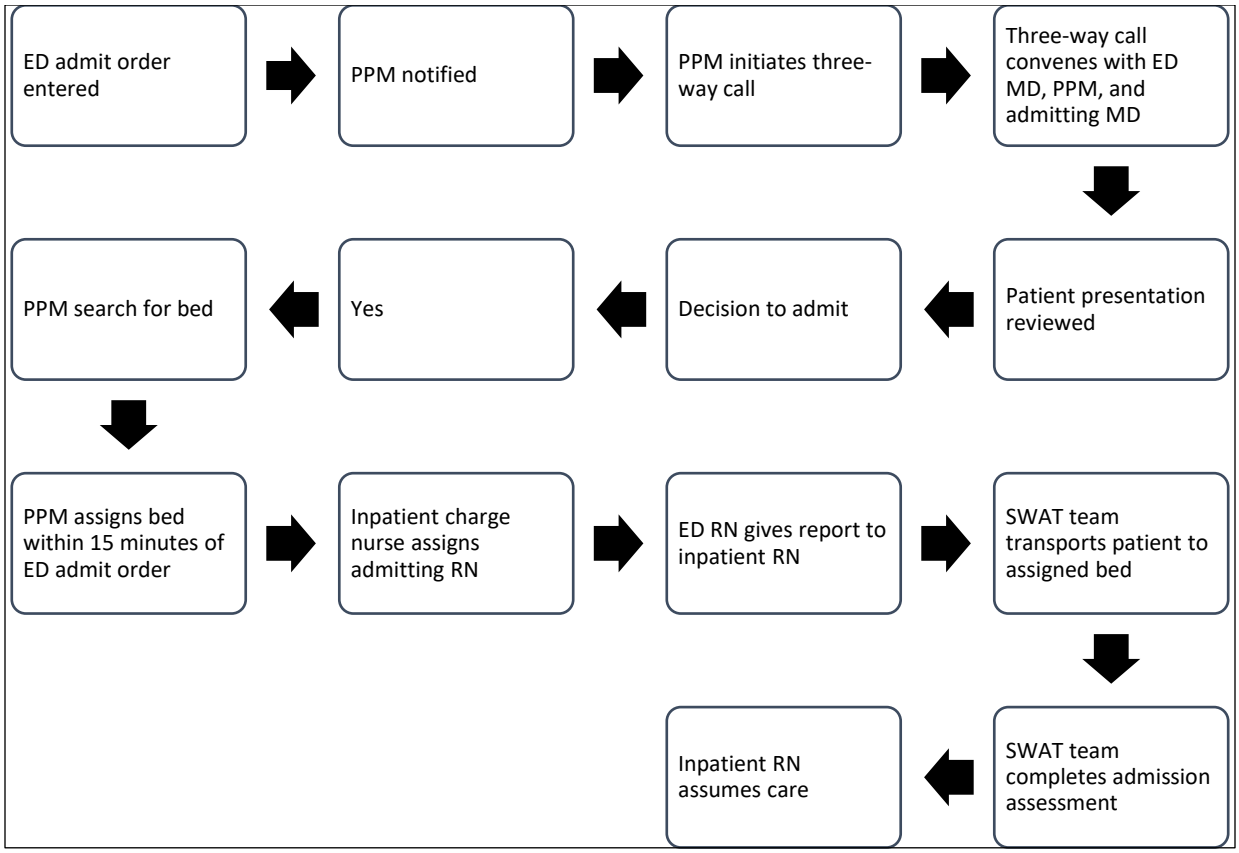

Figure 8. T – 60 Hospital Patient Throughput Workflow. ED = emergency department; MD = medical doctor; PPM = patient placement manager; SWAT = staff without an assigned territory.

Implementation Plan

The recommended plan for implementation begins with adding the role of the PPM to the organizational leadership structure. The PPM is a member of nursing leadership, and it is critical that this role has a reporting relationship that leads to the chief nurse executive (CNE). The PPM must build and maintain collaborative relationships with physicians, case management, other nurse leaders, social services, and other members of the interprofessional team. Working collaboratively with the interprofessional team integrates the PPM into the organizational leadership team. The PPM is central to the success of the T – 60 Hospital Patient Throughput

model. It is essential for the PPM to have excellent critical thinking abilities, verbal and written communication skills, the ability to work collaboratively with the interprofessional team, substantial leadership capabilities, and critical care experience. A determination of the number of hours to initially assign the PPM is critical, along with establishing what technological support the PPM will require to be successful. As a foundation for the T – 60 Hospital Patient Throughput model, mobile personal communication devices, the EMR, and a bed board are the basic requirements; the PPM should be an expert on navigating the EMR and the bed board and, hence, may require extensive training in their use. A critical review of the ED admission volumes and seasonal trends according to the day of the week and time of the day would help to support the added resource of the PPM role.

The SWAT team is another critical resource for the T – 60 Hospital Patient Throughput model. To be most effective, nurses who are trained in critical care and who have excellent communication skills are essential to the success of this model. The SWAT team will use personal mobile devices for communication in addition to the EMR, and team members could benefit from having access to transport equipment such as transport monitors with defibrillation capability, and motorized gurneys, wheelchairs, or carts to transport patients. The SWAT team will require training to use the EMR efficiently and effectively.

Conducting ILR may be most effectively rolled out by first implementing a strategy to identify which inpatient leader will round on ED patients who have been boarding in the ED for 120 minutes or more. Since use of ILR is expected 24 hours a day, perhaps the leader with the most knowledge of the hospital throughput is best to accomplish that task. The PPM would be in the best position to complete ILR, which also supports the idea of adding this role as a part of the

organizational leadership structure. The PPM could also serve as an administrative leader in organizations in the off hours.

Plan for training. Training of the PPM and the SWAT team would be specific to the roles of each. The PPM would be required to have extended training in the EMR, the bed board, and communication with physicians, senior, executive, and nursing leadership. It would also be beneficial for the PPM to have an extensive overview and thorough understanding of each unit, the ED, the operating room, and the post anesthesia care unit. For the administrative leadership team, setting goals that the PPM, nursing leadership, and ED leadership can work to achieve is critical. Training of inpatient leaders and ED leadership, charge nurses, and senior leaders is crucial to the success of the T – 60 Hospital Patient Throughput model; the training will include terminology, goals, and strategies that support improved hospital throughput. The staff could also benefit from being trained on the workflows that can be seen in Figures 4, 5, 6, and 8. These workflows are adaptable for use and measurement.

Calculating costs. Budget and costs related to implementation include those for training, acquiring technology, and labor. The PPM could be an add-on to the department where the administrative leaders reside. Adding the PPM provides for collaboration among the administrative leaders and the PPM. Doing so also supports cross-training, which may be beneficial for organizations that may not find the need for a designated PPM 24 hours per day, 7 days per week. The average labor cost for an administrative nurse leader in Northern California is $85 per hour; annualized, that salary would be $176,800 per year. Benefits calculated at 30% of annual salary would cost $53,040. The total labor cost for one PPM working 40 hours per week would be $229,800 per year per full-time equivalent. The cost of benefits could vary, as determined by the appointment of the PPM. Because the PPM would be a member of the

leadership team, this role would be most beneficial in a pay structure that is exempt and based on an annual salary versus hourly pay.

Expenses associated with scheduling a SWAT team can be deferred by temporarily adjusting the schedule of staff nurses to meet the hours of the high-volume ED census. Scheduling the SWAT team for 8-hour shifts to include the busiest times in the ED would be most beneficial. The SWAT model can be expanded and easily customized to meet the needs of the organization or facility. The average labor expense for a staff nurse is $60 per hour. SWAT team coverage by critical care nurses for 10 hours per day equates to 1.75 FTE at the cost of $218,400 per year. Benefits factored in at 20% of annual salary would cost $43,680 for a total cost of $262,080.

Method to test change.

Using a PDSA cycle, the T – 60 Hospital Throughput model can be rolled out strategically and is easily adjustable to meet the specific organizational needs. It is recommended that the model is reviewed every 90 days during the first year to determine effectiveness. The workflows included can be used to develop an evaluation plan. The measures identified can be adapted to determine effectiveness at the organizational, facility, department, and unit levels. During implementation, a process for regular assessment of progress is recommended.

Measurement. Measurement of achievements requires the identification of goals that work to support the organizational vision for hospital patient throughput. Establishing those goals should begin with distinguishing the start of the process as the ED admit order. Performance is monitored by measuring (in minutes) from the point of the ED admit order to the point of bed assignment and from the point of the ED admit order to the point of the patient's arrival at the assigned bed. Figure 8 is a bar graph that is reflective of two hospital patient

throughput metrics using average time in minutes. This bar graph is customizable and can provide a visual chart of monthly performance. This graph can also be used to show baseline pre-intervention performance as well. Using this graph for performance provides the organization with a visual scorecard of information that measures performance in the current state and provides a means to compare current performance against past performance. The performance of the PPM is then measured by how efficiently an available bed is assigned within 15 minutes of the ED admit order. The accounting of all available beds provides information needed to report hospital capacity. The PPM is responsible for the daily reporting of the percentage of patients who arrived at their assigned bed within 60 minutes, the percentage of patients who were boarded in the ED for 120 minutes or more, and the percentage of patients boarded in the ED for 120 minutes or greater who did receive ILR. The PPM, the SWAT team, the ED staff, and the inpatient leaders will be held accountable for these metrics.

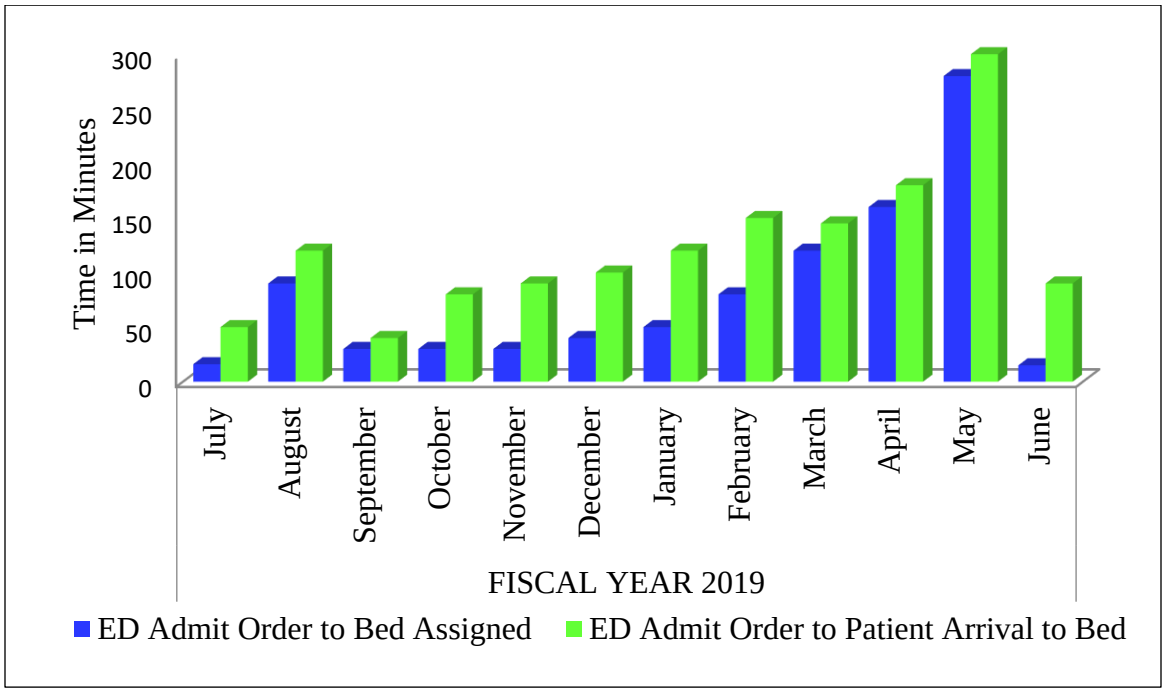

Figure 9. Hospital Patient Throughput Performance Scorecard. Customizable graph illustrates monthly performance of two throughput metrics.

A monthly hospital throughput committee that includes representation from senior nursing leadership, senior hospital leadership, ED leadership, charge nurses, and inpatient unit leadership must be established. The hospital throughput committee will review barriers to hospital patient throughput, ILR, practices that support hospital patient throughput, measurement of goal attainment, and reports of each inpatient unit's metrics. The hospital patient throughput committee will report quarterly to an executive leadership committee that can support requests from the hospital throughput committee. Accountability will be established as part of the performance matrix for the organization, with each member of the department being responsible for achieving hospital patient throughput.

Barriers to implementation. A great implementation plan must identify barriers to successful execution of the plan. The T – 60 Hospital Patient Throughput workflow has cost for additional labor associated with full utilization and implementation. These costs must be analyzed to determine if the organization can find the value in implementing this workflow. Working in an environment where staff are represented by a union may present another barrier to implementation. If this barrier is to be overcome, the implementation plan must include a plan for staff input. The impact of this new workflow will have an impact on the frontline staff and transparency and collaboration at every step will promote a successful implementation. Lastly, the T – 60 Hospital Patient Throughput workflow could be implemented to be budget neutral in some organizations while others may require additional resources. Aligning organizational goals with associated cost can create hesitancy in bringing on new practices. Collaboration with the interprofessional team can help to overcome some of these challenges.

Discussion. The T – 60 Hospital Patient Throughput model is an amalgamation of the SWAT team and PPM models. IRL is an additional EBP that has been added as a modification

for ED boarders who are not assigned to an inpatient bed within 120 minutes of ED decision to admit. Figure 9 describes the workflow for ED patients boarding in the ED for 120 minutes or more. The evidence supports IRL on all ED boarders as a practice that promotes ED boarders arriving at available beds sooner. ILR also promotes collaboration between ED leaders and inpatient leaders. The recommended implementation plan provides a concept for execution inclusive of regular assessment, measurement, and adjustments. The labor costs associated with the T – 60 Hospital Patient Throughput model can be adjusted to add more staff to assist with customizing the plan to meet the needs of individual organizations or facilities. The most cost-effective method that can be used with positive results is IRL on patients boarding in the ED for 120 minutes or more. The SWAT team will then round on patients boarding in the ED every 2 hours until the patient arrives to their inpatient bed or the patient discharges. When organizations seek to improve ED overcrowding, hospital patient throughput must be optimized.

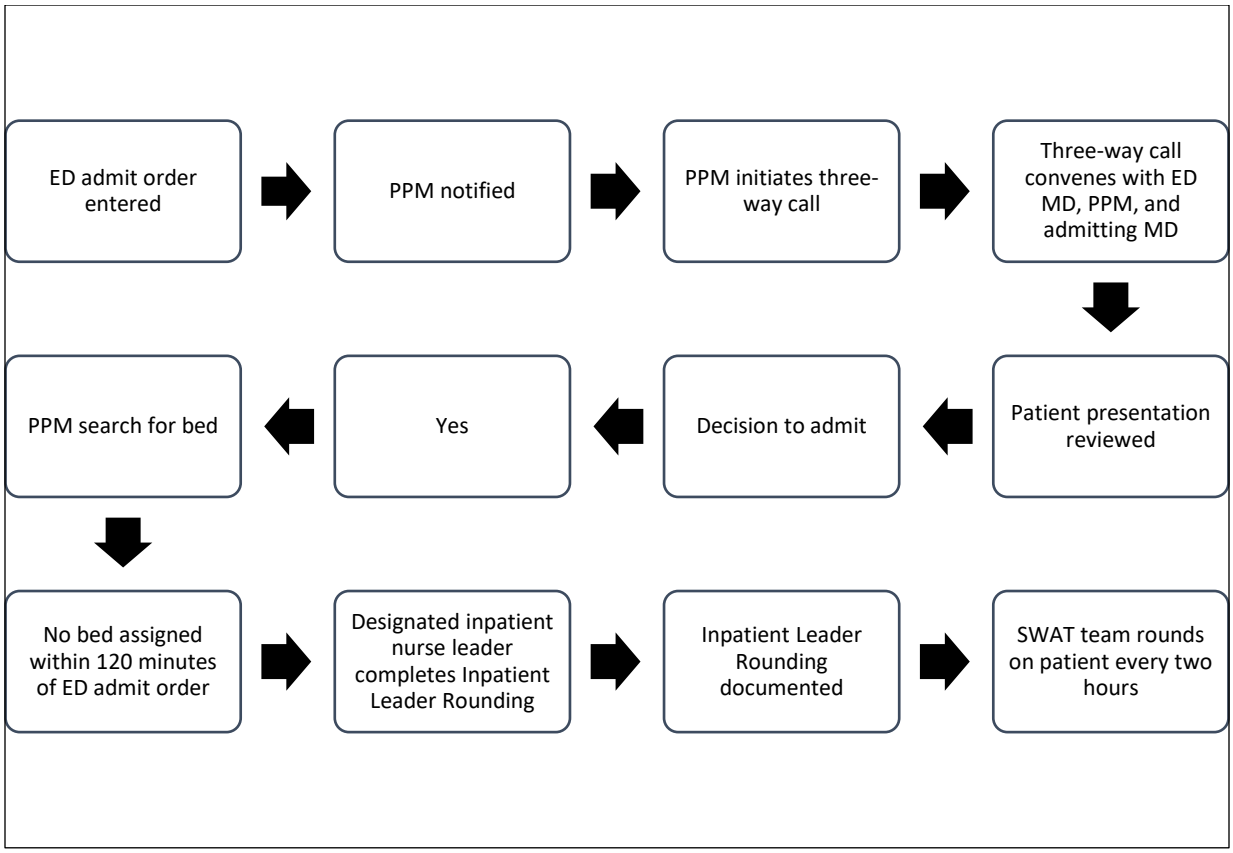

Figure 10. T – 60 Hospital Patient Throughput Workflow modified for no bed assigned within 120 minutes. ED = emergency department; MD = medical doctor; PPM = patient placement manager; SWAT = staff without an assigned territory.

Conclusions and Recommendations

Hospitals across the United States are experiencing increasing demand for services. Responding to increasing complexity and the need to be as economically and fiscally responsible as possible while remaining competitive, organizations must find solutions to ED overcrowding. ED overcrowding presents significant risks to patients seeking care and to the bottom line of healthcare organizations. Implementing solutions that are based on evidence can facilitate patient throughput, improve quality outcomes for patients and, conversely, create a positive impact to

the bottom line. The ED is a major gateway for many inpatients; this gateway must have options that promote patient flow to inpatient areas where patients can be treated and discharged. Maintaining flow within the ED is an imperative for acute care organizations.

This project aims to identify practices that optimize hospital throughput and streamline efficient placement options for ED admissions, with the goal of producing an EBP guide that will improve patient throughput on a systems level, thus impacting ED patient flow to inpatient units. The EBP guide introduced EBPs that have been shown to facilitate patient throughput, provided workflows that are efficient and cost-effective, and introduced a plan for implementation. Although no single plan will fit every hospital, the presented EBP practices can provide a starting point at which organizations can begin the journey to improving flow from the ED by promoting hospital-wide patient throughput and by addressing barriers using a systems approach.

This guide to EBPs provides a simple plan for addressing ED overcrowding and hospital-wide throughput. In this guide, IRL, a proven EBP, is presented with a workflow that can be easily integrated into the most common nursing leadership structures and does not add additional cost. Adding resources to improve hospital-wide patient throughput may be a concern. In the quest to promote hospital patient throughput, organizations must employ creative, innovative methods to improve access and eliminate ED overcrowding.

Optimization of hospital throughput requires system-wide efforts to maximize efficiencies related to moving patients through the system. Barriers to hospital throughput that could delay ED admissions and contribute to ED overcrowding include room turnover times, the discharge process, and scheduling and use of procedural areas that may necessitate inpatient admission. Recommendations for future quality improvement projects include incorporating

EBPs that enhance efficient and effective processes around reducing LOS and enhancing the discharge process. Other recommendations include studying room turnover times and augmenting the scheduling for procedural areas that may necessitate inpatient admissions to better align with hospital throughput goals.

A recommendation for an effective method to evaluation efficacy of the T – 60 Hospital Patient Throughput workflow would be to first review selected performance measures. Next a comparison of current or pre-intervention patient satisfaction, quality, and patient safety metrics to post-implementation performance would provide data that will guide next steps. The plan for future implementation includes a scorecard that can incorporate quality metrics (LOS and readmission rates), patient satisfaction, and patient safety outcomes. A full evaluation of the effectiveness of the T – 60 Hospital Patient Throughput workflow can be established and sustained through development of measurable goals and monitoring performance throughout the implementation period. Adjusts can be made to best fit the organization.

The final objective of this project is dissemination of the EBP guide and workflows developed within this manuscript. This author will seek to participate in and present the workflows in part and in whole for poster presentations. A poster presentation has been completed and another poster presentation is scheduled within the next 45 days. Lastly, this author will also seek future dissemination of this manuscript in a peer reviewed journal.

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Appendices

Appendix A. Strategies to Improve Hospital Patient Throughput

EBP	Overview	Outcome	Author
Access center	Single access point for all admissions into the medical center staffed 24/7 b RNs	1. Denials have decreased 2. Patients placed at the appropriate level of care 3. Appropriate acceptance of admissions	Sg2 (2008)
Hospitalist responsible for ED admissions	Assign a hospitalist to process admissions in ED to expedite throughput	A 6-year retrospective study comparing the utilization of hospitalist vs. generalist reported hospitalists had lower adjusted cost (by 16%) and lower average LOS (by 8.3%) than generalist	Sg2 (2008)
PPM	PPM and decision support instruments	1. Effectively manage patient flow 2. Open the lines of communication to reduce flow stoppages	Rathlev et al. (2014)
Geographical Assignments	Distribute hospitalists to one or more inpatient units	1. Drives efficiency 2. Fosters collaboration 3. Increased time with patients and families	Sg2 (2008)
SWAT Team	Nurses are deployed to the ED to admit inpatients	1. Patients admitted when units and nurses are busy 2. Transport patients from the ED 3. Reduced lateral transfers and improved 4. Reduced the workload of the nurses on the unit 5. Improved patient throughput from the ED	Simmons & Goldschmidt (2014)
Increase weekend discharges and services	Focus efforts on discharging more patients on the weekend and offer expanded support services on the weekend	1. The average number of boarders went from 20 to zero with a focused effort to discharge patients on the weekend. 2. Reduced length of stay by a day 3. Improved capacity	Salway et al. (2017)
Pull until full	Inpatient staff moves ED admits from the ED to inpatient units	1. Inpatient units physically move patients from the ED 2. Inpatient units call the ED for report	Baker & Esbenshade (2015)

EBP	Overview	Outcome	Author
Full capacity protocol	Move patients from ED hallways to inpatient hallways	1. 2000 patients moved to inpatient hallways and found to be safe 2. Patients prefer inpatient hallways vs. remaining in hallways ED 3. Reduces the length of stay	Salway et al. (2017); Viccellio et al. (2013)
AMT	Boarders are admitted to a virtual unit, while physically still in the ED and treated by an inpatient AMT team	1. Improved patient outcomes and resource utilization 2. Lower cost for patients, when compared to patients admitted to the inpatient unit 3. Reduced LOS and higher early discharge rates	Lateef et al. (2017)
Hospital-wide throughput committee	An interdisciplinary team that meets monthly; key stakeholders with the ability and authority to promote and support practices to achieve goals and eliminate barriers that interfere with efficient admission of ED patients	1. Provides visibility of metrics and outcomes 2. Multi-disciplinary hospital-wide collaboration3. Sustainable improvement in throughput4. Accountability developed	Baker & Esbenshade (2015)
Bed huddles	During huddles, best practices such as discharging patients before noon, inpatient discharge rounds, pulling patients from the ED, elimination of practices that inhibit full visibility of beds, and centralized bed control or patient placement are used	1. Inpatient units discuss the plan for admit, discharge, and transfer 2. Executive leaders attend and facilitate/remove barriers to throughput 3. Allows for collaboration amongst inpatient and ED 4. Fosters early inpatient discharges	Baker & Esbenshade (2015)
Inpatient Leader Rounding	Inpatient leaders round on inpatient boarders in the ED	Establishes ownership for the transition, building trust, reduces uncertainty related to extended delays and promotes better clinical outcomes	Baker & Esbenshade (2015)

Abbreviations: AMT = acute medical team; ED = emergency department; PPM = patient placement manager; SWAT = staff without *an assigned territory.*

Appendix B. SWOT Analysis

Internal Factors	External Factors
Strengths • An engaged nursing leadership team. • Physician champion. • Interest in improving throughput is widespread.	*Opportunities* • Decrease ED boarders. • Improve patient throughput. • Improve patient and staff satisfaction.
Weaknesses • Limited education resources. • Need for improved communication.	*Threats* • Employee buy-in of the evidence-based practice guide • Education will be costly. • Competing organizational priorities.

Abbreviation: ED = emergency department.

Appendix C. Observation Unit Model

Considerations	Options		
Costs	Building the Unit	Staffing	Supplies
Establish the number of beds needed	Determine number that would best offload ED and optimize inpatient beds		
Area and location	Adjacent to the ED	Outside of the ED	
Leadership	ED	Inpatient	
Physician coverage	ED	Hospitalist	
Nursing station	Centralized	Decentralized	
Patient room style	Private	Shared	Ward
Bathroom style	Private	Shared	Hallway
Focus	Single diagnosis	Multiple diagnoses	Patient population
Requirements	Family lounge	Electronic medical record	Space for clean and soiled linen and supplies
Support services needed	Environmental services, dietary, pharmacy	Phlebotomy, social services, case management	PT/OT, wound care, imagining, pharmacy
Care transition	D/C home or long-term care	Admit to inpatient	
Goals	Short-term management of patients	Create alternative option to inpatient hospitalization	

Note. This list is not all inclusive. Abbreviations: D/C = discharge; ED = emergency department; OT = occupational therapy; PT = physical therapy.

Appendix D. AIDET With Scripting

AIDET		Action	Example
A	Acknowledge	Greet the patient and family members by their preferred name.	"Good morning, Mrs. Smith."
I	Introduce	Introduce yourself to the patient/family.	"My name is Molly Johnson. I am the critical care services director and a member of the leadership team here at XYZ Medical Center."
D	Duration	Commit to a specific time frame that you will update the patient on bed placement.	"A member of the leadership team will communicate with you within the next 2 hours to keep you informed on the progress of assigning you to an inpatient unit."
E	Explanation	Explain what is going on and what we are doing to resolve it.	"XYZ Medical Center is currently full. We are working diligently to get you a bed. When a bed becomes available, we will move you to an inpatient unit." Ask, "What questions do you have"?
T	Thank You	Thank the patient for trusting the team with the patient's care.	"Thank you, Mrs. Smith, for choosing XYZ Medical Center for your care. We know that you have other options, and we appreciate you trusting us to care for you."

Note. Example of how the AIDET model can be used during leader rounding (Swedish Medical Center, 2013).

Appendix E. Project Proposal Timeline

Activity	NURS 788 (Weeks 1–16)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Submit project proposal	X			X												
Revision of project proposal	X	X	X	X	X	X										
Develop proposal presentation							X									
Present standard workflow				X	X											
Meet with committee chairperson		X	X				X	X	X	X	X	X	X	***X***	***X***	***X***
Complete presentations and review of journals									X	X	X					
Prepare IRB application									X	X	X					
Data collection																
Analyze data																
Final project preparation, write-up, and final edits										X	X					
Final project proposal defense presentation										X	X			***C***	***C***	***C***

Abbreviation: IRB = institutional review board, ***C*** = optional meetings with chairperson.

Appendix F. Glossary

Term	Definition
Acuity	The intensity of nursing care required to meet patient care needs
ED boarding	Patients are held in the ED or other designated areas for extended periods of time after ED admit order.
ED overcrowding	Patients exceed the capacity of the ED, resulting in delays in care, long wait times, and poor quality.
Escalate	Report barriers to a higher level within the organization for resolution.
SWAT	Staff without an assigned territory
Throughput	Movement of patients through the hospital

Abbreviation: ED = emergency department.

Appendix G. Guide Development Timeline

Activity	NURS 788 (Weeks 1–16)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Develop guide	X	X														
Review guide for practical application			X				X			X	X					
Submit guide for review to Committee				X				X						X		
Present evidence-based practice guide for expert review						X			X		X					
Meet with Committee Chair	X	X	X	X	X	X	X	X	X	X	X	X	X	***X***	***X***	***X***
Complete revisions					X					X	X					
Final project guide													X	X	X	X

Note. ***X*** = Optional meetings with chairperson

Curriculum Vitae

Maulah Halley
moluv@yahoo.com

Qualifications

- Excellent interpersonal skills, with the ability to effectively communicate with patients, staff, management, physicians, and providers
- Exceptional leadership skills, with experience of leading staff teams while cultivating a proactive, collaborative work environment conducive to positive staff morale and superior patient care
- Extensive experience in managing as many as 64 beds and over 150 FTEs while leading staff and support teams during various shifts under urgent conditions
- Exemplary information management skills including document/report preparation and review, data analysis, and flow chart management
- Extraordinary organizational skills inclusive of streamlined filing systems, data management, document review and control

Education

University of Nevada Las Vegas School of Nursing, Las Vegas, NV May 2019
Doctor of Nursing Practice (Executive Leadership)

University of Minnesota School of Nursing, Minneapolis, MN
March 2008
Master of Science in Nursing (Adult Health Clinical Nurse Specialist)

Winona State University, Rochester, MN
May 2002
Bachelor of Science in Nursing

Minneapolis Community & Technical College, Minneapolis, MN
May 2000
Associate of Science in Nursing

Career

University of California San Francisco (UCSF) March 2018- Present
San Francisco, CA
Unit Director-Cardiothoracic, Vascular & Transplant Unit

- Supports and facilitates nursing care delivery that ensures patient and family-centered care, while managing 45 beds and over 90 FTEs
- Oversees hiring, retention, termination, performance improvement, policy review, revision, and development
- Ensures staff remains current with licensure, certifications, health exams, and education

- Handles various other duties required for the successful functionality of the unit, including fiscal management, staffing, scheduling, improving patient outcomes, and setting departmental goals

Kaiser Permanente East Bay October 2017- June 2018
Oakland, CA
House Supervisor/Bed Control

- Acted as the on-site administrative designee for the entire facility for off-shifts and weekends
- Managed all patient care departments, while ensuring appropriate quality of care and compliance with regulations
- Coordinated and monitored staffing for all shifts, while maintaining appropriate staffing levels and skills mix
- Ensured staff provided quality care and remained in compliance with the Nurse Practice Act, The Joint Commission, as well as federal, state, and local requirements.

Kaiser Permanente East Bay January 2016- October 2017
Oakland, CA
Administrative Services Director

- Served in operational director responsible for hospital staffing of all inpatient nursing personnel, EVS, Dietary, Transport staff, House Supervisors, Bed Control, Stroke Coordinator, GRASP Coordinator, and PICC RNs, patient throughput, the facility, and patient education
- Organized and coordinated admissions, transfers, and discharges
- Developed and enforced procedures to ensure legal compliance and superior standards
- Managed budgets and monitored expenditures
- Point of contact for CDPH investigations/surveys

Keck Hospital of USC/ The First String August 2015- January 2016
Irvine, CA
Interim Nurse Manager/Service Line Manager – Cardiac Telemetry, Vascular & Transplant Unit

- Handled day-to-day operations of the Cardiac Telemetry, Vascular and Post-Transplant unit (32-bed DOU)
- Managed 32 beds and over 70 FTEs
- Established and maintained relationships staff, physicians, providers, and interdisciplinary teams which set the tone for a collaborative work environment
- Maintained responsibility for other duties, including policy review, revision and development, fiscal management, staffing, scheduling, competencies, and improving patient outcomes

Bakersfield Heart Hospital March 2015- August 2015
Bakersfield, CA
Director of Critical Care Unit & Patient Care Unit

- Handled day-to-day operations of the CVICU and the Cardiac Telemetry Unit
- Maintained responsibility for hiring, implementing disciplinary actions, and managing budgets

- Implemented staff trainings and evaluations to provide all staff with the essential resources and information required to provide excellent patient care
- Developed policies, met regulatory guidelines, and maintained survey readiness

Northridge Hospital Medical Center June 2014- February 2015
Northridge, CA
Clinical Manager – Cardiovascular Unit

- Handled day-to-day operations of the Cardiovascular Unit
- Implemented methods to promote and achieve patient, staff and physician satisfaction
- Met quality and strategic goals required to ensure the proper implementation of policies and functionality of the unit
- Reviewed, monitored and maintained staff, budgetary, and financial documentation

Cedars-Sinai Medical Center October 2011- July 2014
Los Angeles, CA
Service Line Manager – Cardiac Telemetry, Progressive Care & Centralized Monitoring Center

- Managed 2 units, 64 beds, over 150 FTEs, and the Centralized Monitoring Center
- Managed a leadership team which consisted of 2 Assistant Nurse Managers and 8 Clinical Nurse IVs (Clinical Experts and Unit Supervisors)
- Developed, revised, and reviewed policies necessary for the successful operation of the unit
- Ensured that staff remained in compliance with required licensure, education, and community service participation

Kaweah Delta Medical Center November 2009- September 2011
Visalia, CA
Nurse Manager – Intermediate Critical Care Unit

- Managed 33 bed intermediate critical care unit (ICCU), 80 FTEs, and short-term PCI unit (6 beds)
- Coached and mentored staff through the successful Magnet Journey
- Maintained responsibility of hiring of new staff and implementing disciplinary action when necessary
- Managed budgets and other financial expenditures
- Promoted a collaborative workplace by participating in and encouraging healthy relationships with and amongst staff and physicians

Methodist Hospital March 2009- November 2009
Saint Louis Park, MN
Associate Nurse Manager – Intensive Care Unit

- Participated in the daily operations of the unit and reported to the Nurse Manager
- Assisted in the identification of goals and the implementation of process improvements for the unit
- Led, managed, and evaluated aspects of patient care/outcomes, staff resources, productivity, improvement projects, and interdisciplinary collaboration necessary for patient care

- Exhibited flexibility by working variable shifts to complete responsibilities and meet the needs of the patient care unit

Unity & Mercy Hospital June 2007- October 2009
Coon Rapids, MN
Administrative Nursing Supervisor/Patient Placement Supervisor

- Mentored and coached staff while providing oversight of hospital operations
- Facilitated quality patient experience by maintaining open lines of communication between staff and patients
- Provided leadership while exhibiting adaptability during evening and night shifts and weekends and holidays
- Coordinated daily staffing and patient placement

Globe University/Minnesota School of Business March 2007- October 2009
Minneapolis, MN
Nursing Faculty

- Created and developed curriculum for Nursing Theory and Nursing Pharmacology courses for pre-licensure BSN students
- Served as a clinical and lab instructor while teaching students fundamental skills required to successfully perform as student nurses in a clinical setting
- Taught students in a clinical setting, which prepared them to effectively function in external clinical environments during enrollment and post-graduation
- Incorporated prior experience to give further insight into various nursing roles

A.S.A.P. Staffing February 2006- June 2007
Inter Grove Heights, MN
Travel Nursing Assignment - ICU

- Provided clinical and managerial leadership for 24-hour provision of patient care to ensure optimal patient outcomes
- Developed and directed the planning, implementation, and evaluation of clinical and nursing services within area of responsibility
- Assisted staff by providing supplemental support and/or direct assistance
- Displayed flexibility by traveling to various locations to provide excellent patient care and sufficient leadership and administrative performance

Fairview Southdale Hospital September 2004- February 2006
Edina, MN
Patient Care Supervisor

- Assisted the Director of the Float Pool in the supervision of personnel and projects
- Participated in the hiring and review of Float Pool team staff
- Conducted performance evaluations for Float Pool team member which included RNs, NAs, HUCs, and Patient Transport
- Performed the above duties in the Intensive Care Unit, from which essential experience was gained

Minneapolis Community and Technical College December 2004- January 2007
Minneapolis, MN
Adjunct Nursing Faculty

- Assigned, supervised, and evaluated pre-licensure nursing students, practical nursing students, and nursing assistant students in variety of clinical settings
- Participated in the provision of an environment conducive of conscious and effective learning for each student
- Provided learning experiences which effectively and efficiently met the educational requirements of each postsecondary student
- Prepared students to successfully pass NCLEX and Safety Care for Patient examinations

North Memorial Medical Center May 2002- May 2005
Robbinsdale, MN
Staff Nurse

- Assessed patient conditions, passed medications, administered treatments, and accurately documented patient conditions
- Provided quality care for critically ill patients by incorporating nursing knowledge and skills and serving as an advocate for the patient to facilitate optimal patient outcome
- Maintained open lines of communication with residents, physicians, staff, and management
- Prioritized duties and assignments in an effective manner

Hennepin County Medical Center February 2000- July 2003
Minneapolis, MN
Staff Nurse (RN)

- Provided nursing care to patients inclusive of monitoring and documenting patient conditions and providing subsequent follow-up and treatment to patients
- Implemented the daily routine of assigned area
- Managed and reviewed departmental, functional and procedural documents required for assigned area
- Initiated contacts to increase education and knowledge necessary for the provision of dynamic nursing care

Certifications, Memberships, and Licensure

- American Association of Critical Care Nurses
- American College of Healthcare Executives
- California Association of Healthcare Leaders
- Sigma Theta Tau International Honor Society of Nursing (Zeta Chapter)
- Jonas Nurse Leader Scholar (2014 – 2016)
- Nurse Executive Advanced (2018 – 2023)
- Minnesota Board of Nursing (exp. 09/2020)
- Georgia Board of Registered Nursing (exp. 02/2020)
- California Board of Registered Nursing (exp. 10/2019)
- ACLS (exp. 05/2019)
- BLS (exp. 05/2019)

Presentations

Evidence-Based Practice Guide & Workflows to Reduce ED Overcrowding and Improve Hospital Throughput. Poster presentation at the Sixth Annual Clinical InQuERI Conference San Francisco, CA, January 30 – January 31, 2019.

Evidence-Based Practice Guide & Workflows to Reduce ED Overcrowding and Improve Hospital Throughput**.** Poster presentation at the Western Institute of Nursing (WIN) Conference San Diego, CA, April 12, 2019.

References

Available upon request