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Effectiveness of an Observation Unit and Transition Team on Length of Stay:
Before and After Study

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Introduction

Emergency department (ED) overcrowding is an ever-growing problem in our national healthcare system causing countless negative outcomes. According to the Centers for Disease Control (CDC), of the 136.3 million people treated every year by emergency services nationwide, 11.9% meet admission criteria, leading to an over-extension of resources and an overcrowded emergency department (CDC, 2015). Numerous reports of these adverse outcomes such as avoidable deaths and decreased quality of care, pose an emerging threat to public health. (Beniuk, Boyle, & Clarkson, 2012).

According to the National Center for Health Statistics (NCHS) data brief, "from 2003 through 2009, the mean wait time in U.S. emergency departments (EDs) increased 25%, from 46.5 minutes to 58.1 minutes"(CDC, 2012). Current researches suggest that emergency department overcrowding causes a significant increase in ED length of stay (LOS) for patients awaiting disposition or inpatient bed assignments (i.e. boarding) (Morris, Boyle, Beniuk, and Robinson, 2012). Boarding is when patients remain in the ED after the decision to admit or transfer to the unit; however there are no bed availabilities, resulting in an increase LOS (Hing & Bhuiya, 2012). Consequently, an increase in LOS ultimately leads to a decrease in all facets of quality of care, such as timeliness, patient-satisfaction, and patient safety (Morris, et al., 2012). There have been many proposed solutions to decrease ED overcrowding and increase the quality of care in this particular population, such as (a) ambulance diversion, (b) increasing nurse-patient ratio, and (c) admitting boarded patients to already full unit (Morris, et al., 2012). However, there is little research suggesting the use of combining short-term observational

units, as well as transition teams, in order to reduce ED LOS in patients awaiting disposition or inpatient bed assignments.

The purpose of this study is to explore the effect of using short-term observational units and transition teams in order to decrease length of stay in patients originating from the emergency department who are awaiting disposition or inpatient bed assignments.

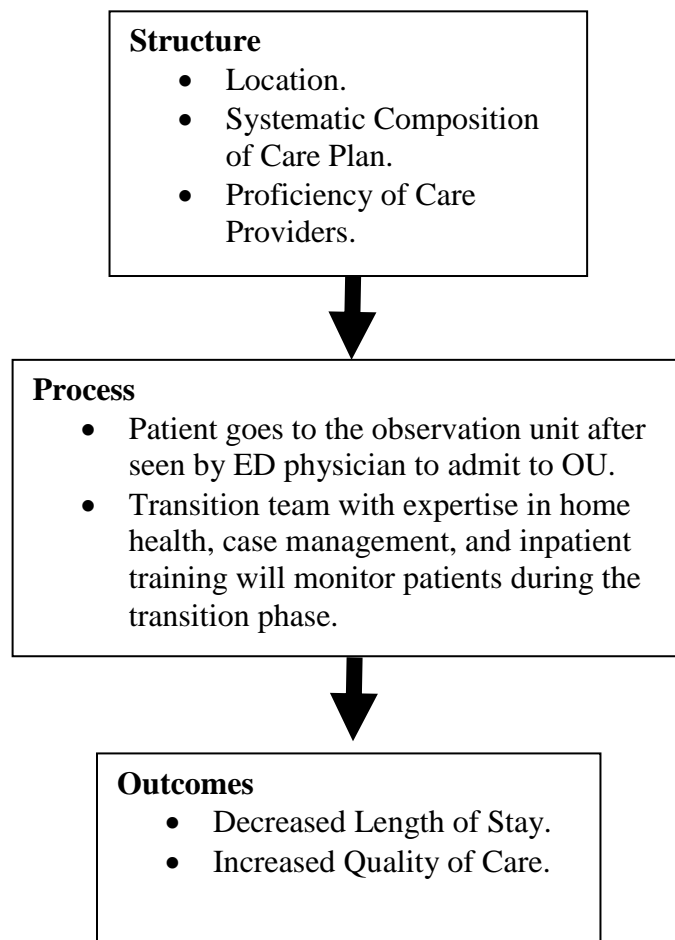
Theoretical Framework

In assessing the effectiveness of combining short-term observational units along with the transition team in decreasing patient's length of stay in the emergency department, an outcome-based model is needed. In doing this type of framework, it helps ensure that the processes provided the best care plan for the patient. The Donebedian framework is known in the research field as being synonymous with the evaluation of interventions in the healthcare arena (McDonald et al., 2007). Both researchers and healthcare policymakers use Donebedian's outcome-based model to deliberate intrinsic methods that affect poor care given to patients awaiting disposition or bed availability (Liu, Singer, Sun, & Camargo, Carlos, 2011).

There are three different methods that blend to form this framework: structures, processes, and outcomes. The structures approach consists of three criteria. It must have a physical setting or location of where the care is given as well as a systematic composition for the care plan and proficiency of care providers (McDonald et al., 2007). The process phase of this conceptual framework identifies the actual mechanism of the utilized intervention. In the process phase of this study, the observation unit is where the patient, while awaiting disposition or a bed "boarding", will be placed instead of the hallway. The transition teams will consist of trained care providers for this particular unit, who will be

efficient in implementing the orders received from the providers and have strategic skills in transitioning the patient to the floor or discharging. Since emergency room nurses have different skills than inpatient nurses, having a transition team staffed with allied health professionals will increase the quality of care (Liu et al., 2011). The outcome phase is the examination of the measurements and interventions utilized. Evaluating the structure, and the process of these combined interventions will result in decreased length of stay for patients in the emergency department, which will increase the quality of care provided (Figure 1).

Figure 1



Literature Review

Current research articles regarding the use of short-term observational units and transition teams in mitigating the emergency department overcrowding were retrieved using databases CINAHL, CINAHL Complete, and MEDLINE for scholarly articles. The key search terms included were the following: *emergency department overcrowding, crowding, short-term observational unit, transition teams, nurses' role, and inpatient care*. Journal articles reviewed were peer-reviewed articles published within the last ten years. Six studies were found regarding the use of observational units as an intervention in decreasing the length of stay in the ED, increasing patient satisfaction, decreasing inpatient admission rate and increasing adequacy of discharges. However, three studies were found regarding the use of transition teams, which can include inpatient nurses, home health nurses or even physician's assistant, in caring for patients in the observational units of the ED. These studies were reviewed to determine the benefits of the observational units in the ED, the variables that predict direct patient admission from observational unit or discharge planning, and the utilization of other allied health care providers along with nurses and physicians to improve the flow in an overcrowded ED. In looking at these, current studies the common themes we found were predicting variables for disposition, feasibility and safety, qualified staffing, and discharge planning.

Predicting Variables for Disposition

In regards to the use of an observation unit (OU), we found that the proper use of observation units with clear and concise clinical pathways is effective in reducing length of stay (LOS) in the ED and also within the unit. According to a simulation scenario study conducted in a pediatric emergency department (PED) about the impact of

observation unit and patient transfer mandate in decreasing overcrowding, it showed that a combination of these two interventions resulted in reductions in time to be seen by physician and LOS in patient who were triaged compared with PED operations without an OU or transfer mandate protocol (Hung & Kisson, 2009). The baseline LOS with regular PED operations with low acuity patients were 228 minutes but with the utilization of OU and the transfer mandate protocol to transition the patients from OU inpatient bed assignment or discharging patients it decreased to 216 minutes. In other words, having observational units are more beneficial when there are set criteria and protocols for patients that are seen in the OU in order to have an efficient patient flow.

Predictive variables must be formulated in order to determine if patients need to be closely observed in OU or be directly admitted for further care. A prospective observational study conducted by Chan, Arendts, and Stevens (2007) in St. George Hospital in Wales, Australia showed that they had group diagnosis that were directed to OU; however, out of these group diagnoses, most of them were cardiovascular or gastrointestinal diseases. There were four criteria (inability to independently ambulate in the ED, requiring ongoing treatment in OU, requiring referral to another subspecialty prior to transfer to the OU and requiring referral to allied health while in the OU) that cause a direct admission to the floor due to the severity of illness (Chan, Ardents & Stevens, 2007). According to Iannone, and Lenzi (2009), length of stay (LOS) within the short-term unit (SOU) was significantly shorter than before after setting up clear and concise clinical pathways to their observation unit. Specifically, in 2006 more than 38% of cases exceeded the limit of 24hr compared with less than 4% in 2007 ($p < 0.01$) (Iannone, & Lenzi, 2009). Also, in a descriptive cross-sectional study by Ahmad,

Rahman, Mohamad, and Baharudin (2010), they found that the mean LOS in the observation unit was 4.12 +/- 1.78 hours (95% CI=3.8-4.4). They concluded that by pulling patients out of the ED faster they were given a better quality of care. As a result, there was a decrease in LOS in the unit and the hospital.

Feasibility and Safety

Establishing an OU with a highly qualified transition team in the ED can be seen as costly and not effective in all hospitals. However, previous published literature of trauma hospital indicates that having an OU is not only efficient but also feasible to create and implement in the ED when protocols for diagnoses are clearly delineated and defined (Madsen, Bledsoe, & Bossart, 2009). In a retrospective chart review that was performed in a level 1 trauma center, this review showed that out of 364 patients that were admitted to the OU, 84.6% of the patients met the inclusion criteria while 3.8% were excluded and directly admitted to the hospital for further evaluation. This indicates that the OU with defined protocols and criteria was a safe alternative for the minimally injured trauma patients (Madsen, Bledsoe, & Bossart, 2009).

Qualified Staffing

The observational unit without proper staff to back it is in essence the same as not having an observational unit to help with patient flow. Staff from multiple disciplines will help improve LOS. In order for the nurse to flourish in this environment they must have three different qualities, they must be able to: get patients in and out of the unit as quickly as possible, adapt to a skillset that is very broad, and multitask and rise to the occasion amongst a stressful environment (Griffiths, 2011). Potts et al. concluded that by having a home healthcare nurse within the observation unit, 31% of possible admissions

could be discharged with appropriate home services (2007). Provider staffing by physician assistants on the observation unit is able to free up physicians to see additional ER patients. During a 14 month study at the University of Utah after the inauguration of the observation unit there were no deaths, intubations, or adverse events that occurred among chest pain or trauma patients during the patient's LOS that was contributed to their care by a physician assistant (Sherwood et al., 2011). Furthermore, one trauma patient was found to have an injury that was not diagnosed during the original stay on the observation unit. This injury was mild in nature and only consisted of a small piece of glass that was retained within a laceration (Sherwood et al, 2011).

Discharge Planning

High qualified staffing in OU is vital in order to assure patient safety, and adequacy in discharge planning. During the discharge process of any patient from the unit or hospital it is vital for staff to effectively demonstrate and convey adequate discharge planning and instructions. Patients must have the basic knowledge and understanding of why they are admitted and what the plan for them during their stay in the hospital and after discharge from the hospital. Since OU is another unit apart from ED confusion and miscommunication can arise as barriers for effective transition of care for patients. It is vital for the transition teams to relay the message clearly to each patient that is admitted to OU.

Adequate discharge planning is necessary in order for the patient to have a smooth transition within the hospital units or at home. A study was conducted to determine the adequacy of discharge planning and patient's understanding of discharge instructions from short-term OU (SOU). According to Arendts, Mackenzie and Lee

(2006), most patients discharged from SOU were provided with accurate discharge planning and instructions by staff in the OU. A survey was conducted after the admission of the patients who were admitted to OU, and from 596 patients who were surveyed only 211 responded to the questionnaires. Eighty-five per cent of respondents from the survey stated that they received adequate discharge instructions and 89% said that they benefited from their stay at the OU (Arendts, Mackenzie, & Lee, 2006). Education and support from transition team are also crucial aspect of SOU according to Wills, Crowley and Hutton (2011) because it establishes rapport and trust with the patient and families. The patient satisfaction rate in all the aspects of care in the SOU was high overall, which determines the effectiveness of utilizing highly qualified staffing that are trained in all areas of nursing especially discharge planning.

Methods

Study Design and Population

In this quasi-experimental study (to determine the effect of utilizing a short-term observational unit and transition team in decreasing patient's length of stay in the ED, observational unit, and hospital), a convenience sample of emergency department patients 18-80 years of age will be recruited at a level-one trauma center (a hospital equipped to handle any level of trauma and has a trauma surgeon onsite, and an operating room open at all times) in Chattanooga, TN.

Operational Definitions

An observation unit will be established consisting of the following: (a) eight beds with portable monitors and resuscitation equipment, and (b) the transition team. The OU would have the following operational requirements: (1) it would only care for patients

who meet our inclusion criteria, (2) it would be closed if there were no admitted or observation patients in the ED, and (3) it would be opened if there were more than 1 admitted or observation patient and would remain open until all admitted or observation patients in the OU are transferred or discharged. The transition team will consist of the following: (a) one midlevel provider (e.g nurse practitioner or physician’s assistant), (b) two registered nurses trained in emergency services, inpatient care, and home health resources, and (c) the case manager from the ED will be utilized on both units. The goal of these highly qualified staff is to communicate effectively to ER physicians as well as admitting hospitalist to expedite the disposition for the patients in the observation unit. Another purpose of the transition team is to assure that patients are not on hold for inpatient bed assignment in the ER, therefore mitigating emergency room overcrowding.

Table 1 Inclusion Criteria

Significant injury and grouped medical diagnoses for patients placed in observation unit	
• Laceration/penetrating wound	Facial/rib/clavicle/scapula/spinal fracture
• Closed- head injury	Headache/postictal/TIA/Vertigo
• Extremity fracture/dislocation	Nausea/abdominal pain/gastroenteritis
• Intracranial haemorrhage	Anemia/DVT/collapse/syncope/dizziness
• Pelvic/hip fracture	Fall/confusion/social admission
• Renal colic/UTI/urinary retention	First and Second degree burn

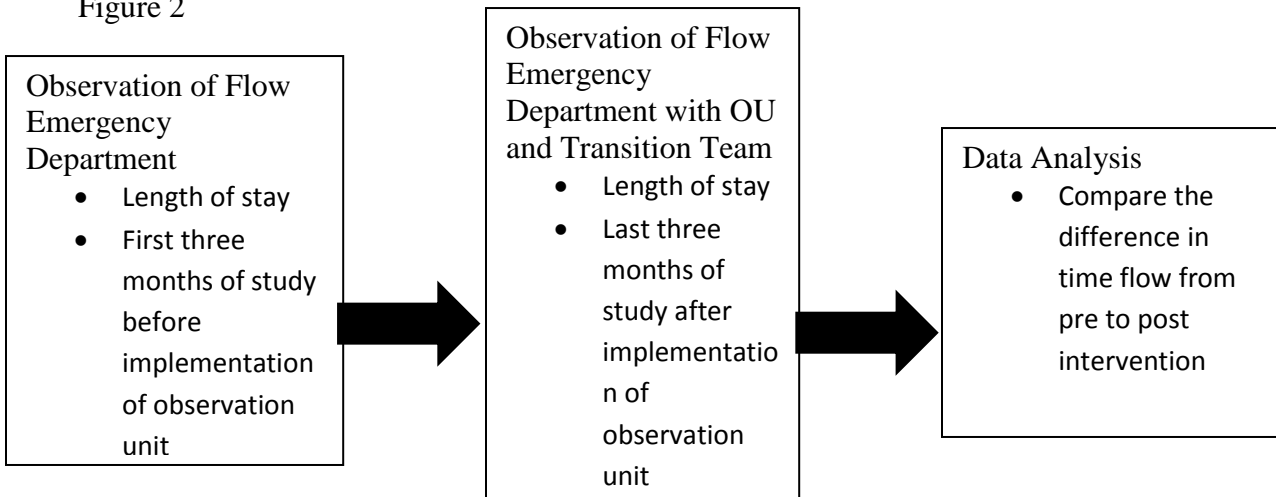
Table 2 Exclusion Criteria

Variables and factors not appropriate for the observation unit
• Systolic B/P>200

- Diastolic B/P >105
- O2 requirements of more than 5 L nasal cannula
 - Ventilator
 - BiPap
- Critical lab-work per hospital lab panel
 - Low potassium levels are acceptable if replacement has been started
- Positive Troponin
- Positive CK-MP
- Dialysis Patients
- Cardiac Drips
- Heparin Drip

Patients placed in the observation unit will carry a variety of medical and trauma-related diagnoses, the most common being nausea, vomiting, diarrhea, closed-head injury, laceration or penetrating wounds (table 1). The exclusion criteria for the OU are described in Table 2. Length of stay for this purpose is defined by the time the patient meeting inclusion criteria initially signs in to be seen in the ED to the time of disposition from ER. After the intervention, LOS will be defined as the time the patient meeting inclusion criteria initially signs in to be seen in the ED to the time of disposition from either the ED or the observation unit. In this study, we will be comparing the LOS before the intervention for 3 months with the LOS after the intervention for an additional 3 months in order to determine the effectiveness of the observation unit and transition team to decrease overall LOS in the study participants (Figure 2).

Figure 2



Ethics

In order to respect human dignity, a full intervention protocol will be submitted to the Southern Adventist University Institutional Review Board for approval. During the span of this study, all information was gathered with respect to the participant's confidentiality.

Measurement

There was no specific existing measurement that we could exploit for our data, except for time itself. Therefore, the measurement that we will be utilizing is a timeframe for length of stay in minutes. This is because we are comparing the LOS in minutes from the pre-test group to the LOS in minutes from the post-test group.

Data Collection

After receiving approval from Southern Adventist University's institutional review board, data will be extracted from the hospital electronic databases for length of stay for both groups. Arrival time to the ED and disposition time from the ED will be recorded in SPSS, unless the LOS is already calculated in the databases. In that case, we will record the LOS for both groups.

Data Analysis

Data analysis will be performed using IBM SPSS version 22.0. Descriptive statistics will be used to describe baseline data. An independent-samples *t* test will be calculated comparing the LOS for patients meeting inclusion criteria both before and after the intervention. If the data is not normally distributed, then we will use the non-parametric Mann-Whitney test.

Conclusion

At the end of this study, the researchers hope to have gained knowledge regarding how the use of an observation unit and transition team can decrease the ED LOS for patients awaiting disposition or inpatient bed assignments. The researchers plan to take information and experience gained to sharpen the use of observation units and transition teams in hopes of adaptation nation-wide. It is the hopes of the researchers that by harnessing these strategies, there will be a decrease in overall LOS and ultimately an increase in all facets of quality of care.

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