Development and Implementation of Admissions Criteria for a Clinical Decision Unit

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Abstract

Emergency department (ED) wait-times and patients leaving the ED without being seen (LWBS) are concerning issues. Such issues have prompted reconsideration of the current process used to direct patients at point of first contact. The clinical decision unit (CDU) may be a crucial link in this process. Expeditious transfer of observation patients to the CDU may decrease the ED overcrowding and ED patient wait-times, and also the percent of LWBS ED patients. The length of stay (LOS) for observation patients may decrease with use of a dedicated CDU with specific admissions criteria. CDUs may provide cost savings to payers, patients, and hospitals This QI-DNP project was designed on a Donabedian conceptual framework (and education on Rogers' diffusion of innovation theory) and was implemented as a PDCA cycle. The project included the development of CDU admissions criteria supported by the evidence-based research showing that CDUs may alleviate ED overcrowding by transferring appropriate patients (as identified by clearly established criteria) out of the ED. Nursing staff and providers received education on the CDU admissions criteria. A dedicated 11-bed CDU was opened, with the purpose of improving efficiency, effectiveness, and treatment times of ED patients. The DNP project decreased LOS for the CDU patients, decreased the LWBS from the ED, decreased door-to-provider times in the ED, and decreased admit-to-bed times for the CDU patients.

*Key words: C*linical Decision unit(CDU), Short stay unit, observation unit, Emergency Department(ED), Emergency room (ER), ED throughput, CDU admissions criteria

Development and Implementation of a Protocol and Admissions Criteria for a Clinical Decision Unit

People who present to Emergency Departments (ED) request treatment for a variety of ailments. Any individual seeking medical attention in the ED must be seen regardless of race, origin, ethnicity, sexual orientation, or type of medical insurance. Frequently, the ED is overflowing with people requiring treatment. Consequently, patients may experience delays in treatment. Some may become frustrated and leave the ED without being seen by a provider (Hamrock, E. P., 2014).

Another factor contributing to waiting times and delays in treatment is occupation of ED beds by patients awaiting test results or admissions decisions. This may result in inefficient use of ED resources (Teets, 2014). One hospital in the northeastern United States, recognizing the seriousness of the problem, opened a clinical decision unit (CDU) to address overflow in the ED. The CDU will admit patients for short stays (less than 24 hours) who are awaiting test results and receiving treatment, with no set disposition decision made as of yet; these are typically ED patients. In advance of the opening, nurses and providers received focused training in criteria for inclusion in, or exclusion from, the unit. To ensure appropriate admissions standards, a comprehensive protocol defining criteria, and a plan for preparing nurses and providers to implement the practice change, was necessary. Often, ED patients seek treatment for issues not requiring prolonged hospitalization. Research suggests that absent of life-threatening diagnoses, and when patients have anticipated hospitalizations less than 24 hours, CDUs may be the best option (Hamrock, 2014). Timely transfer of short-stay patients would both free up ED beds for more critically ill patients and ease the bottleneck of ED patients waiting to be treated. Patients are brought into the triage area by the triage nurse to be assessed and an ESI number is assigned

to the patient, which defines the priority with which they need to be treated by a provider. Frequently, the provider will see the patient in triage and place orders to start the workup and treatment of the patient. A CDU could potentially decrease door-to-treatment times for patients in the ED.

Because CDU admissions affect overall hospital flow, care must be taken in the design and implementation of a protocol on which the daily functioning of the unit is based. Since identifying the target population for the unit's services — patients requiring observation less than 24 hours in duration — is central to its effectiveness, attention to detail in design of inclusion/exclusion criteria, training of staff in those criteria, and testing (and establishing the need for, and the nature and frequency of, periodic retesting) the effectiveness of that training, form important links in design of the CDU.

Background

A dedicated CDU or short-stay unit located outside of the ED is a proven strategy for increasing patient throughput and allows patients to be seen on a short-term basis (Carpenter, 2015). Patients in these units are typically monitored for 6 to 24 hours until they are medically cleared or discharged home. CDUs are also used to cohort patients in one geographic area. Such units have been shown to decrease length of stay (LOS), enhance ED access, foster patient and staff satisfaction, reduce mortality, and improve ED efficiency (Jibrin, 2008).

CDUs are specialized and serve as an alternative to in-patient admission. The success of a unit in achieving its intended purpose depends on precisely defined operational protocols and strict adherence to them, with a fixed time limit for patients who are admitted. The unit is managed by medical experts, and patients who are determined to require longer hospitals stays would not be admitted to the unit. Patients presenting with chest pain, asthma or COPD

exacerbation, syncope, gastroenteritis, or community-acquired pneumonia are typically seen in CDUs (Baugh, 2011). In order to make informed decisions about admission to the CDU based on best-practice standards, a multidisciplinary, collaborative team formulated inclusion/ exclusion admissions criteria.

Problem Statement

The increase in ED wait times and patients leaving the ED without being seen are serious issues in general, and specifically at the 150-bed New York State hospital. The problem arises in part from patients increasingly seeking primary care at the ED rather than with their primary care physician (Scrofine, 2014). This trend has necessitated a reconsideration of the way patients are directed at point of first contact, making the CDU a crucial link in that process.

At the same time, organization of the CDU — its processes and procedures — has influences that extend throughout the hospital. Consequently, protocol design must consider not only explicit statement of inclusion/exclusion criteria and their delivery to staff, but also clear-cut quantitative measures of efficacy, including ED wait times (to first being seen by a provider), ED throughput, and length of stay (LOS) for CDU patients, with subsequent data analysis of the CDU's performance trends. Standard statistical tests make possible a comparison of the CDU's LOS and the ED's wait-time average with national averages.

Medical observation patients are currently placed throughout the hospital wherever there is a vacant bed, rather than in a dedicated CDU with well-defined admissions criteria. The hospital's VP of Nursing reports that the LOS for clinical decision patients currently exceeds national guidelines of 26 hours. She hopes that opening the CDU, and developing and implementing inclusion/exclusion criteria, will help to decrease the CDU patient LOS to below 18 hours. Other issues to be addressed with this project are the high numbers of patients leaving

the ED without being seen by a provider (approximately 6%), and above average times from arrival to when patients are in a treatment room in the ED. With the opening of the CDU, and admission of appropriate patients to this unit from the ED based on the established criteria, ED beds will be freed up, LWBS will be decreased, and arrival-to-treatment times for ED patients will be decreased.

The protocol was developed by this project leader and approved by a multidisciplinary team. Appropriate training was delivered to staff (and its effectiveness quantified), and chains of command will be clarified prior to the CDU's anticipated opening in April 2018. The design of the protocol will take into account other factors, for example the complex interplay between reducing wait times and LOS on the one hand and maintaining maximum occupancy for the CDU's 11 beds on the other, which will require fine-tuning of communication between units. The efficacy of the CDU cannot be fully judged, nor can its value to the hospital be fully realized, by practices that do not consider the CDU's function within that larger context. In addition, the usefulness of the unit must take into consideration its place in the fiscal and staffing landscape of the ED and the hospital as a whole, and whether its "positives" — fiscal or operational — outweigh its possible "negatives."

Purpose Statement

The purpose of this project is to improve efficiency and treatment times of ED patients through the implementation of a CDU for admitted patients. Research supports the usefulness of CDUs in alleviation of overcrowding, by moving patients deemed appropriate candidates out of the ED to the unit at the first opportunity (Gabele et al., 2016).

Project Objectives

The efficacy of any project can only be judged by placing its stated objectives in juxtaposition with measurable data arising from its implementation. The proposed organization of a CDU sets its objectives accordingly. The project objectives were:

1. Develop a protocol for a CDU that identifies inclusion- exclusion criteria for CDU admission, to decrease incidence of inappropriate admissions.
2. Educate staff prior to the opening of the unit to ensure staff consistently identify appropriate patients according to protocol-based admissions criteria.
3. Decrease the average ED door-to-treatment time to 60 minutes or less.
4. Decrease ED decision-to-admit times to a bed to 2.5 hours.
5. Decrease the number of patients leaving the ED prior to receiving care from the provider to 3% or less.
6. Decrease the LOS of CDU patients to 18 hours or less.

Project Question

The DNP project will answer the following question: Will the implementation of an admissions criteria protocol in a CDU decrease ED door-to-treatment times to 60 minutes or less, decrease admit to a bed times to 2.5 hours, decrease LOS of CDU patients to 18 hours or less and decrease number of patients leaving the ED without being first seen by a provider?

Impact of the Problem

Overcrowded EDs result in longer wait times, patient dissatisfaction, and patients leaving the ED without being treated (Ross, et. al., 2013). Many patients who seek ED treatment are not sick enough to warrant hospital admission, yet not well enough to go home. These patients may occupy ED beds for up to 48 hours, causing a bottleneck of patients in the ED waiting room,

waiting to be seen by a provider (Gabele, 2016). These boarders or holds consume a lot of resources and labor. They prevent the ED staff from bringing in the next patient to be seen and cause a back-up of patients. ED boarding and ambulance diversion have been recognized by the Institute of Medicine (IOM) as unacceptable consequences of ED overcrowding that need to be addressed (IOM, 2006). Two-thirds of U. S. hospitals do not have a dedicated CDU. Most of these hospitals place clinical decision patients in any bed, typically in-patient beds without protocols. These patients experience longer lengths of stay and utilize more resources than CDU patients in a unit with protocols and dedicated staff. Many U.S. hospitals are establishing dedicated CDUs to maximize ED throughput, decompress the ED, and decrease lengths of stay for clinical decision patients (Ross, Hockenberry, Mutter, Barrett, et al., 2013).

Literature Review

A search of the literature was conducted using the electronic databases CINAHL and PUBMED. The key terms used were "medical observation units," "observation units," "short stay units," "clinical decision units," and "emergency room observation units." "Clinical protocols" and "admissions criteria for observation units" were also used as key terms. The search was limited to publication years 2011 to 2017. The term "medical observation unit" yielded two empirically based citations. The terms "observation unit," "short stay unit," "clinical decision unit," and "emergency room observation unit" yielded 32 citations, 19 of which were published in English, empirically based, and incorporating robust sample sizes. This author could find no articles with clinical protocols for medical observation unit, observation unit, clinical decision unit, short stay unit, emergency room unit or admission criteria in the main title. With continued research, one citation had protocol-driven in its title which will be reviewed in this paper. In total, 20 articles will be the focus of the following literature review.

Protocol-Driven Clinical Decision Units

Ross, Hockenberry, Mutter, Barrett, Wheatley, and Pitts (2013) examines protocol-driven emergency department CDUs having shorter patient length of stay (LOS) and reduced admissions, with cost savings for both the patient and institution. Comparison of data, related to the three identified areas of study, were gathered from three hospitals in the greater Atlanta, Georgia area. The study considers patients treated in four types of observation services, categorized by presence or absence of a dedicated CDU, and by presence or absence of defined protocols for admission and treatment. Ross, et al. (2013) delineates the models in the hospital setting of observation services as:

> Type 1: Designated clinical decision unit, protocol-driven, with admissions criteria utilized to determine which patients are appropriate for the unit. Care is typically directed by ED physicians or mid-level providers. The unit is based in the ED.
>
> Type 2: Designated CDU, with discretionary care directed by a variety of specialists.
>
> Type 3: Virtual CDU, bed in any location, protocol-driven.
>
> Type 4: Bed in any location, discretionary care by a variety of specialists. Care is unstructured; this is the most common setting hospitals utilize to provide clinical decision services (Ross, et al., 2013).

The literature contains several calls for establishing a clinical decision unit in, or adjacent to, the emergency department. Silverman & Choppa (2016) explore the rationale for the development of a CDU. Decreased in-patient admissions, lower costs for patients and hospitals, decreased wait times for ED patients, decreased numbers of patients leaving the ED without being seen by a provider, and improved ED throughput are some of the advantages described as benefits to opening a CDU. They explain the importance of admitting appropriate patients to the

unit and using inclusion/exclusion criteria to determine which patients are appropriate to be admitted to the CDU. They describe the CDU as a service rather than a status (Silverman, 2016). They also discuss the importance of addressing the interests of the CNO, medical director, ED physicians, hospitalists, case management, lab, radiology, echo, vascular labs, physician specialists and nursing staff, for the unit to be successful because, as stakeholders, their input and buy-in is crucially important to its success.

Ross et al. (2013) examine data on observation patients who were seen in three EDs under investigation, considering diagnoses, patient characteristics, and length of stay. Data were then compared to data from a representative sample of US hospitals, and also with that of all hospitals in Georgia meeting type 1, 2, 3 or 4 clinical decision unit criteria. The three Atlanta hospitals used for the investigation — Emory University Hospital, Emory University Hospital Midtown, and Grady Memorial Hospital — ranged from 511 beds (Emory University Hospital Midtown) to nearly 1,000 (Grady Memorial). All were identified as public hospitals; two offered generalized care with some specialization. In the three hospitals studied, annual ED visits varied greatly, from a low of 35,000 at one end to nearly 100,000 at the other. Ross et al. (2013) observed that for all three hospitals in the study, Type 1 CDUs — dedicated units with condition-specific protocols — have the best patient outcomes. These findings include shorter lengths of stay, less diagnostic uncertainty, increased patient satisfaction, lower costs for clinical decision patients and hospitals, and lower rates of in-patient admissions (and readmissions).

Barrett, Ford, and Smith (2012) examine ED overcrowding and its consequences for patients. They conclude that the most prominent factor affecting overcrowding is the prolonged presence of admitted patients in the ED because no inpatient bed is available. They describe the ED as the front door to the hospital and underscore the need to address ED overcrowding. The

aim of this article was to develop a bed management strategy based on a retrospective review of patient flow information from a 221-bed Trauma II medical center (with 59,000 ED visits a year) in a Midwestern suburb. As a result of findings from this 2010 chart review of 10,967 patients, a bed-management strategy was developed. A multidisciplinary team was formulated to evaluate, develop, and implement interventions to improve patient flow, time-to-bed placement, and ED hold times. Immediately bedding a patient being admitted for observation or in-patient admission helped relieve ED overcrowding and patients leaving without being seen by a provider, while decreasing ED hold hours and ambulance diversion rates. Clinical decision units can have a positive impact on all these metrics. The findings from this study echo those found elsewhere in the literature already reviewed: measures taken to decrease ED overcrowding also decrease wait times. The CDU can be a key component for improving effectiveness of emergency services.

Baugh (2011) and Scrofine (2014) both discuss the impact emergency department (ED) CDUs have on ED wait times, ED throughput, decreasing number of patients leaving the ED without being seen by a provider, and increasing patient and staff satisfaction. Overcrowding in the ED is a big issue and developing admissions criteria for ED clinical decision units and closely following those criteria are essential to the success of all CDUs (Baugh, 2011).

Bradas (2016) discusses the importance of having clear guidelines for admission to a medical short-stay unit. Decreased inpatient admissions, lower costs for patients and hospitals, decreased wait times for ED patients, decreased numbers of patients leaving the ED without being seen, and improved ED throughput are some of the advantages he describes as benefits to opening a medical short-stay unit. He explained the importance of admitting the appropriate

patients to the unit and using integrated pathways to treat CDU patients. However, he stopped short of listing specific criteria for admission to the unit.

Stang, Crotts, Johnson, Hartling, & Guttman (2015) did a systemic review to identify existing measures of ED crowding that were linked to quality of care. Six major bibliographic databases were searched from January 1980 to January 2012; in addition, relevant journals and conference proceedings were searched manually. Studies that did not provide measures of ED overcrowding were excluded. Overall, 15 of the crowding measures studied had quantifiable links that were inversely correlated to quality of care (Stang, et al., 2015). Three measures were identified as most strongly linked to quality of patient care: ED occupancy (number of beds filled), number of patients in the waiting room, and number of admitted patients in the ED awaiting an inpatient bed. Stang (2015) concluded that ED crowding and quality of care were closely, and inversely, correlated. However, the 15 crowding measures studied were not identified, and no data were provided on the link between crowding measures and the IOM domains reflecting equitable and efficient care (Stang, et al., 2015).

Stakeholders

Several studies have shown that cohorting patients with specific conditions in CDUs can decrease both length of stay and cost, providing benefits across the board to stakeholders. Those benefits are felt at the institutional and national levels. Hess and Nestler (2012) discuss the development of outpatient CDUs to decrease short-stay inpatient admissions. They investigated the efficacy of observation units in caring for patients with chest pain potentially caused by acute coronary syndrome (ACS), CHF, syncope or atrial fibrillation with evidence-based protocols in an emergency department CDU. They reviewed studies conducted in the mid-1990s for patients at intermediate, short-term risk for cardiac events. They concluded that evidence supports the

efficacy of caring for low-to-intermediate-risk ACS patients in a CDU (Hess, 2012). Limitations of this research included the age of data used in the study and the limited risk stratification done to identify those patients who would benefit from admission to a CDU.

Carpenter, Short, Williams, Yandell & Bowers (2015) utilized a pre-post design to evaluate the effectiveness of a Clinical Decision Unit (CDU) in caring for CHF patients and reducing 30-day readmission rates. The authors compared data between two similar hospitals differing in existence of a CDU — one had it, the other did not. During the first month of the study, the project committee found that the volume of patients directed to the CDU was inadequate and expanded the population accepted into the unit to include those with chest pain. The committee developed admission and discharge criteria and order sets to standardize care and decrease LOS. This addition boosted the volume of the unit and decreased overcrowding in the ED, while additionally providing capacity relief for the inpatient units. The hospital with the CDU realized a reduction in the length of stay by cohorting patients in a designated unit, with subsequent cost savings that the hospital without a CDU did not realize. The CDU project team continued to involve all stakeholders to improve unit performance and grow volume (Carpenter, 2015).

Baugh, Liang, Probst & Sun (2015) created a Monte Carlo simulation reflecting current clinical practice in the United States, with data taken from contemporary, peer-reviewed literature and national survey data. Their objective was to estimate the annual national cost savings and reductions in LOS from implementation of protocol-directed care specifically for syncope patients 50 years of age or more in a dedicated CDU. Baugh et al. (2015) concluded that observation status (including the age of syncope patients) and where the observation patients are managed are critical to clinical outcomes and downstream costs for stakeholders, including

patients. It is also essential that nurses, providers, and ED and CDU staff, under the direction of nursing and administration leadership (all of whom are stakeholders), are grounded in the details and rationale of admissions criteria and the importance of strict adherence to them.

Current Management

Clinical decision patients currently are treated throughout the hospital, typically in an inpatient bed with limited, if any, structured, condition-specific protocols. There is a poor alignment of resources with patients' needs, and patients have a longer LOS. The ED frequently has numerous in-patients occupying beds as they wait, sometimes for many hours, for an in-patient bed. These short-stay patients currently are placed in inpatient beds where they are observed for a few hours awaiting test results. These patients would be better served in a CDU with admissions criteria and set protocols (Silverman, 2016). Knowing specifically what evidence has been collected, and how individual studies have been designed, as well as limitations of those studies, speaks to the applicability of their findings in the design of a CDU and its criteria for admission. Best practice is always informed by previous practice.

Current Recommendations

Clinical decision services can be provided in CDUs that will decrease short-stay, inpatient admissions and decrease LOS for these patients. The functional purpose of the CDU is to determine if an inpatient admission is necessary (Gabele, 2016). The patients in the unit are monitored for up to 24 hours when immediate ED discharge is not warranted. The key to a successful CDU is a set of clearly defined admissions criteria, policies and procedures, location, proper staffing, clear chain of command, and an understanding of what metrics will be used to monitor the success of the unit (Silverman, 2016). Staff need to be trained to care for clinical decision patients and to understand criteria for potential admissions to this unit.

Benefits of Current Recommendations

CDUs have the potential to provide cost savings to patients, hospitals, and payers (Ross, et al., 2013). The ability to transfer observation patients quickly to the CDU will decrease ED overcrowding, ED patient wait times, and frequency of patients leaving the ED without being seen by a provider (Hamrock, 2014). Patient satisfaction will improve as patients wait shorter periods of time to be seen in the ED and to get a bed. LOS for clinical decision patients will decrease when they are cohorted to one area and specific admissions criteria are utilized to determine which ones are appropriate for admission to the unit.

Conclusion

The weight of evidence examined in the several synopses above suggests the efficacy of using a dedicated CDU for specific conditions. Because the best outcome for all stakeholders arises from making discriminations between those who are best served by such a unit and those better served elsewhere, a clearly formulated protocol, with criteria for admission or exclusion, must be in place and faithfully used to drive clinical decisions, and staff must be educated in its implementation. The implications are broad. Stakeholders from nurses and other care providers and hospital administrators on the one hand, to patients receiving services on the other, are affected by such a protocol. The viability of the care setting, and its effectiveness at addressing an exceedingly multifactorial problem — managing ED wait time and patients who leave without being seen by a provider — may mean everything to individual patients and also to the entire community served. The evidence unequivocally points to the value of the protocol-organized dedicated CDU for improving quality of care for specific populations and enhanced use of ED and hospital resources as a whole. Best outcomes depend upon attention to detailed

planning and implementation, willingness to consider innovation based on evidence, and seasoned judgment, the very province of the DNP-prepared nurse.

Conceptual Framework

The two theoretical frameworks for this quality improvement project are the Donabedian model (Donabedian, 1966), and Rogers's diffusion of innovation theory (Rogers, 1995). Avedis Donabedian, a physician and health care researcher at the University of Michigan, developed the original theory in 1966 and it continues to be widely accepted today. Donabedian's model focuses on three categories: structure, process, and evaluation of care delivery outcomes. According to Donabedian (1966), when evaluating an outcome, organizational structure must be examined. Structure includes staff, resources, and finances. The CDU to be developed, as the outcome of this DNP project, will be a 11-bed unit staffed with two RNs, a patient care technician, on all three shifts; a unit secretary 7a-3p 7 days/week. The unit will be managed by a hospitalist physician or NP around the clock to expedite patient care and to decrease patient length of stay.

In Donabedian's conceptual framework, process refers to how care is delivered and how quality is measured or assessed (Anderson, Knestrick & Barroso, 2015). Process needs to be evaluated to develop an intervention to affect the outcome. Outcome refers to improvement of the health status of patients and populations, as well as the successful communication of the completed project to target audiences. It is crucially important to assess the degree to which patients' needs are met. The Donabedian theory emphasizes that focus on metrics is essential.

Though the Donabedian model was developed in 1966, it continues to be relevant. In 2015, three researchers developed a framework for evaluating a primary health care service integrating community and hospital services in Australia using Donabedian precepts (Reeve,

Humphreys & Wakerman, 2015). Donabedian's framework spelled out key tenets of clinical intervention and how outcomes of health care service interventions are to be evaluated. Successful utilization of the Donabedian model, with its emphasis on structure, process, and outcome, served as a powerful framework for organizing this study.

In addition, the Donabedian model has been used profitably in other instances. In one study, the Donabedian model was used as a framework for bariatric surgery accreditation (Naranjo & Kaimal, 2011). In another, the model was used to assess the quality of integrated chronic disease management (Ameh, 2017). The first dimension of Donabedian's model is setting, in this case the bariatric surgery unit at a hospital. The second dimension — process — was the bariatric surgery itself. Process is essential to the theoretical framework because it allows organizations to provide the optimum patient care. Outcome, the final dimension of Donabedian's conceptual model, consists of measures of effectiveness of process improvement (Naranjo, 2011). Examination of these studies echoes this author's sense that a structured, evidence-based approach to organizing a clinical decision unit as a quality initiative calls for a conceptual framework that is itself overtly structured and top-down and includes measurable outcomes; the Donabedian model is ideal for such an approach.

The Donabedian model was chosen for this DNP project because of its focus on quality care and outcome. The model demands thorough examination of the project's proposed admissions criteria protocol, and its link with process — education of multi-disciplinary staff members. The Donabedian model provides a framework for examining health care services and evaluating the quality of patient care that can be applied in many settings (Donabedian, 1966; McDonald, 2013). The model uses structure, process, and outcome as standards to guide and

monitor progress of a quality improvement project (Naranjo & Kaimal, 2011), and fits well with this DNP project.

The first standard of the Donabedian model — structure — includes both the organizational and physical structures of the setting, a 11-bed unit located on the second floor of a hospital in Upstate New York. All patient rooms are private, visible from the nurses' station, and equipped with cardiac monitoring capabilities. This unit became operational in April 2018 after a newly built tower was opened and the 12-bed Intensive Care Unit relocated to the new tower.

The second standard of the Donabedian model — process — involves development and implementation of a CDU admissions criteria protocol. This DNP student developed a draft of the protocol and convened a multidisciplinary committee to review and revise criteria as needed. The third standard of the Donabedian model —outcome — was monitored. This DNP student provided interdisciplinary education regarding use of the admissions criteria for the CDU; weekly review, for a two-month period, of all admissions to the CDU will identify any inappropriate admissions requiring follow-up or re-education of nursing staff and providers.

Everett Rogers's diffusion of innovations theory (Rogers, 1995) also offers insight as a theoretical support for this project and will contribute to an increased understanding of behavioral change, including appropriate use of the CDU admissions criteria protocol in this quality improvement DNP project. Rogers developed his theory, in 1962, from research on how farmers adopt agricultural innovations. He found considerable similarities among educational, marketing, and medical domains when developing his theory. Rogers defined diffusion as the communication process by which a new idea is accepted by the market. He defined the rate of diffusion as the speed that the new idea spreads from one consumer to the next (Kaminski, J.,

2011). Rogers's theory, though older, is still successfully applied today as a conceptual framework. It has been noted in several current research investigations and it has been applied in a variety of settings. Recently, Rogers's theory has been invoked by researchers in disciplines as diverse as education and economic sustainability (Yuksel, 2015; Dibra, 2015).

Rogers's theory involves five categories of adopters and utilizes a bell curve to show how change takes place in an organization and emphasizes the importance of key stakeholders' buy-in to make the project successful. (The key stakeholders in this project are senior administration at the Upstate New York hospital, CDU staff and providers, ED staff, and ED providers.) In Rogers's theory, people in different parts of the curve are identified: innovators, early adopters, early majority, late majority, and laggards (Valente, 1995).

Innovators require the shortest adoption period of all the categories. They are the risk takers and are motivated by the idea of being change agents. In this quality improvement project, the DNP student is the innovator: She developed the draft of the CDU admissions criteria protocol. Early adopters are powerful individuals in an organization who can persuade others (Melnyk & Fineout-Overholt, 2011). They have a natural desire to be trend setters and are respected by their peers. They are the visionaries. In this project, the early adopters are senior leaders, specifically the Vice President of Nursing, the Medical Director of the hospitalist program, the Medical Director of Professional Affairs, the Medical Director and Nurse Manager of the Emergency Room, and the Chief Executive Officer of the hospital. All are very supportive of the development of a CDU, to be opened in April 2018 in the space vacated by the hospital's intensive care unit, and the development and implementation of CDU admissions criteria to determine which patients would be best served by this unit.

Early majority stakeholders for this DNP project consist of the multidisciplinary team members — providers, case managers, respiratory therapists, physical therapists, and occupational therapists — who will collaborate on development of the CDU admissions criteria protocol. The early majority are the pragmatists. They are comfortable with practice changes that increase productivity. In this project, the ultimate goals are to decrease ED wait times, to decrease the number of patients leaving the ED without being seen by a provider, and to decrease the length of stay for clinical decision patients. Rogers's late majority (Ayanian, 2016) are the conservatives. They respond to peer pressure and economic necessity. Perhaps as much as one-third of the nursing staff will wait until their peers have adopted the innovation. Laggards consist mostly of staff floating into the CDU from other units, but also consulting physicians and volunteers, who will require education in the use of the CDU admissions criteria protocol.

The concept of peer networks is important in Rogers's diffusion of innovation theory (Rogers, 1995). Innovators and early adopters serve as change agents who influence their peers through communication, role modeling, and networking. There are five stages of the adoption process. The first stage is the knowledge or awareness stage, wherein staff will be exposed to the new ideas of a CDU and its admissions criteria protocol. During the ensuing interest stage (the second stage), staff become interested in the new idea and seek more information. During the third — decision — stage, staff apply innovation to their current and future anticipated situation, then decide whether to use the protocol. During the fourth stage, staff adopt and begin to utilize the protocol. During the fifth stage —confirmation — the staff *fully* utilizes the protocol and communicates to colleagues why the protocol needs to be followed (Kaminski, 2011). Rogers's theory stresses the importance of innovators and early adopters in making a new innovation successful. Consequently, Rogers (1995) points to the central role played by the DNP

student spearheading the CDU protocol as not only the initiator of change, but also as the individual eliciting cooperation of early adopters. The ultimate success of the DNP project will depend on her efforts as an organizer, communicator, and liaison among organizational levels.

This project will utilize, as its primary tool, a plan-do-check-act (PDCA) cycle. PDCA cycles are widely used in quality improvement studies, not only in healthcare but also in industry, to effect continuous improvement in QI initiatives. PDCA cycles have several advantages. They require relatively little expertise and offer a route to systematic improvement. They establish ordered process steps that can be part of an iterative cycle of continuous improvement. Each PDCA cycle is evidence-based, and provides a natural point for reconsideration, analysis, and potential adjustment. However, faithful use of a PDCA cycle long term is a significant investment of human resources and institutional capital and may have to be viewed in the context of cost-benefits analysis. PDCA cycles can be a sound choice when implementing changes in clinical practice or developing a design (Zaccagnini, 2017; Moran, 2017). They have the added advantage of familiarity at the project leader's practice site, making stakeholder buy-in, and subsequent implementation, more straightforward.

Interestingly, PDCA methodology originated outside of healthcare, in manufacturing, in the 1980s (Deming, 1986). PDCA consists of four sequential stages. In the first — *plan* — a change that is intended to improve a process is identified. The literature on CDUs broadly suggests that those based on clearly elucidated inclusion-exclusion admissions criteria are most likely to result in significantly shorter patient LOS. The second stage — *do* — essentially consists of testing the change, or plan, of the first step. The third stage —*check* — examines the success or failure of the second stage quantitatively. The fourth stage — *act* — takes stock of

the data analysis of the previous stage, interprets results, and uses those inferences to make adjustments in preparation for iterating the process.

Often, PDCA cycles in healthcare serve as a method of small-scale testing of an initiative or interventional change (Taylor et al., 2013). Though PDCA cycles for healthcare quality improvement are ubiquitous, the literature does not speak in one voice with regard to their validity. Taylor et al. (2013), in their comprehensive meta-analysis of the healthcare PDCA literature, reveal the discrepancy that exists between the ideals of PDCA methodology — repeated cycles, evidence-based evaluation of change, and consistent use of data to drive decisions and revisions — and its use in healthcare settings. Taylor (2013) reports that less than 20% of reported research studies meet these standards! Ideally, data collected and analyzed monthly (or more often) would be ideal, but Taylor (2103) reports than only 15% of studies collect and analyze evidence this frequently. All too frequently, there is no cycle iteration; PDCA terminates after one cycle. What seems most certain is that PDCA tool use, and reporting of it, is inconsistent and, consequently, there is no universal agreement about its legitimacy. However, these problems, once identified, can serve as signposts to guide future implementations.

Description of Project Design

The purpose of this DNP project was to improve ED flow through the development of a dedicated CDU. The project design will evaluate the implementation of the new protocol, as part of a continuous quality improvement (QI) project. The QI intervention will decrease the length of time from door to treatment by a provider in the ED, CDU patients' length of stay in the ED, and consequently decrease admission-to-patient-bed times for CDU patients as well as decrease the number of ED patients leaving the ED without being seen by a provider. The project leader drew up a preliminary draft of the CDU protocol — including inclusion/exclusion criteria, data

to be collected, and training of staff — and convened a multidisciplinary committee to consider its merits, making changes as necessary. The project leader then designed a learning module, with PowerPoint presentation, and presented it to staff. ED data was analyzed — specifically, frequency of left-without-being-seen by a provider and wait-time to be seen by a provider in the ED data — for the three weeks prior to the CDU's opening, and for three weeks immediately after its opening. Additionally, the project leader collected data on LOS for ED CDU observation patients pre- and post-opening of the dedicated CDU. Assessing the efficacy of the project necessitates comparison of quantitative data collected before and after implementation of the protocol to determine the efficacy of inclusion-exclusion criteria and their implementation.

The hospital currently had clinical decision patients admitted to various medical/surgical units throughout the hospital but had no clearly defined inclusion-exclusion criteria. Because of space limitations, the newly dedicated CDU will not serve all of the hospital's clinical decision patients. Consequently, post-opening, there will be two clearly defined clinical decision patient populations: Those in the newly dedicated, 11-bed CDU, and those who stay in the ED awaiting a bed in another unit. LOS data will be collected for *both* populations and compared to determine if the mean LOS for the 11-bed CDU patient population is significantly less than that for other clinical decision patients who are placed elsewhere. Since the proportion of ED patients who leave without being seen by a provider is related to ED LOS, the goal is that the new dedicated CDU will also improve that metric. To examine this issue, the proportion of ED patients who leave without being seen by a provider were compared for the three weeks immediately before opening of the 11-bed CDU and the first three weeks after its opening.

The project leader has determined that a plan-do-check-act (PDCA) cycle was a pragmatic tool for organizing this process, interpreting outcomes, and adjusting practice to foster

continued improvement through evidence-based, study-oriented, iterative cycles of quality improvement. The choice of the aforementioned scale variables lends itself readily to this approach. All of these metrics — LWBS, admission-decision-to-patient-bed times, and bed-to-discharge times — are currently recorded and reported daily by the hospital. Because of this, both the immediate and long-term impact of the dedicated CDU can be measured. Daily reporting makes exacting analysis of trends in process variation — say, the proportion of ED patients who leave without being seen by a provider — straightforward. Because the three-week, pre-opening, weighted average of the variable can be compared with the same metric in the first three weeks post-opening, unfavorable trends in the proportion (an increase in percent of ED leave-without-being-seen patients) post-opening can be identified, and a solution found.

Weekly meetings with the project team were held to review whether inclusion/exclusion criteria are being followed when admitting patients to the CDU. If significant changes in process variation occur, root cause analysis and corrective action will be undertaken. This could include something as simple as shortening the cycle of continuing education for providers and nursing staff in the CDU and ED, or more broadly reconsidering specifics of the inclusion-exclusion criteria and rewriting the protocol.

Population of Interest

The population of interest in this project is the formal ED and CDU leadership teams and the ED and CDU frontline staff in a 150-bed community hospital in Upstate New York. The formal leadership teams consist of the two nurse managers, 9 charge nurses and 2 nurse educators for the ED and the CDU, and 55 RNs, 8 patient care techs, and 5 secretaries in both the CDU and the ED.

Stakeholders

Key stakeholders are hospitalists and ED providers, the medical director of the hospitalist group, the medical director of the ED, and senior leadership. The hospitalist and ED providers include MDs, physician assistants, and nurse practitioners. They determine who is admitted to the CDU, and if criteria for admission are followed. Senior leadership will support sustainability of the project if it is successful.

For the unit to be successful, all key stakeholders need to share the vision and mission of the unit and organization. The executive sponsors of the project are the VP of Nursing and the VP of Medical Affairs. Early engagement and continued involvement of all stakeholders will be key to the success of this project. The project leader will be present on site and established rapport with all stakeholders, answered questions, and scheduled meetings with staff and stakeholders. Other stakeholders include hospital transporters and emergency medical personnel.

Rapport with all stakeholders was established by involving them in developing and revising the admissions criteria, as well as answering questions or concerns about the protocol. The project leader attended weekly CDU meetings' and the monthly CDU and ED staff meetings to review data on LOS for clinical decision patients admitted to the dedicated,11-bed CDU, and the LOS of all other clinical decision patients in the ED.

Barriers

Potential barriers that prevented implementation of this project were delays in opening the new building, which delayed the moving of the ICU to the new building; the CDU as it is going in the space that the ICU vacates. Lack of understanding (or acceptance) of the inclusion/exclusion criteria by the nursing staff and providers may be a barrier; this is a shift in practice for both. Financial impact on the institution may also be a barrier: it can be expensive to

open and staff a new unit. It is important to have stakeholders involved in development of the CDU and criteria utilized to decide which patients are admitted to it. Stakeholders need to embrace their roles in the success of this project.

Setting

This project took place in an acute care hospital in Upstate New York. The organization is part of a large health system comprised of five acute care hospitals within a 20-mile radius. The 150-bed hospital recently built a $99 million-dollar expansion project, adding a new 44-bed ED, three 28-bed medical/surgical units, and a 24- bed intensive care unit. The hospital underwent a merger with four other hospitals six years ago; it continues to consolidate services, programs, and staff for efficiency and cost savings. In April 2018, the new 11-bed CDU will be located in the space vacated by the hospital's ICU. The hospital has never had a dedicated CDU but has always admitted clinical decision patients throughout the hospital, to any available medical/surgical bed. The 11-bed CDU will be located directly above the new ED; it will have seven full-time med/surg/tele RNs and six per diem RNs, two full-time and two per diem patient care techs, one full-time secretaries, two per diem secretaries, one full-time nurse manager, and one full-time nurse educator. Daily staffing includes two RNs, one patient care tech, one secretary on days, two RNs, and a patient care tech on nights seven days per week. Approval for this DNP quality improvement project was obtained from the VP of Nursing at the practice site. There are no identifiable ethical issues or conflicts of interest noted for this project.

Recruitment Methods

The CDU will be managed by the CDU nurse manager and the medical director of the hospitalist group. The unit itself will be separate from the ED and staffed by medical/surgical/telemetry nurses trained in critical care. Education of CDU staff, ED staff, and providers was be conducted by the project leader; instruction consisted of the new inclusion-exclusion criteria for CDU patients. Project participants are employed in a direct patient-care or provider role for clinical decision patients in the CDU. ED nursing staff and providers will also receive this education; most of the patients admitted to the CDU would come from the ED, so it is essential that ED staff have a clear understanding of criteria for admission to ensure that patients are admitted appropriately to the CDU. Nurse Managers of both the ED and the CDU felt it was important that their staffs were comfortable with the new CDU admissions criteria; consequently, they made admissions education mandatory for their staff. Both the medical director for the ED and the medical director for the hospitalist group have committed to admissions education for their providers.

Tools/Instrumentation

ED Metrics

The proposed DNP project utilized the hospital's Meditech computer database and the practice site clinical database. The metrics to be measured were:

. ED door-to-treatment time by a provider

. Time from ED decision to admit to a bed.

. Number of patients who leave the ED prior to receiving care from the provider

. Length of stay (LOS) of patients admitted to the CDU

CDU Protocol

The project leader developed the inclusion/exclusion (admissions) protocol for the CDU, with input from stakeholders, and educated the nursing staff in the CDU and the ED (approximately 60 staff total). Education materials included the protocol, as well as a PowerPoint presentation addressing each area of the protocol.

CDU Knowledge Level

The project lead developed a questionnaire to evaluate whether learners' knowledge regarding inclusion/exclusion criteria has increased after education in the protocol has been completed. It is important to determine the validity and reliability of a tool. Validity expresses the degree to which a measurement measures what is says it is measuring (Bolarinwa, 2016). Reliability refers to the degree to which results obtained by a measurement or a procedure can be replicated (Bolarinwa, 2016). The pre- and post-questionnaire developed by the project leader utilized a Likert scale, with possible answers being strongly agree, agree, disagree, strongly disagree, or true or false. A statistician, who agreed to help audit proper data collection and assist with analysis of the data, was consulted early in the project.

Data Collection Procedures

MOU Knowledge Level

The new protocol for inclusion-exclusion criteria was presented to staff in the CDU and ED in April 2018. The staff completed the pre-and post-tests. A codebook was developed and all the data from the pre-and post-tests was added and analyzed using SPSS statistical software. Each participant was assured of confidentiality and anonymity. Each participant was given a random code known by them alone, and unknown to the project leader. This guaranteed

confidentiality when participants completed the pre-test, and again when they completed the post-test.

ED Metrics

The project leader did a retrospective audit of 50 patients admitted as clinical decision patients throughout the hospital for three weeks before the opening of the CDU. Three weeks post-implementation of the new CDU, 50 charts for patients admitted to the dedicated CDU were audited to measure admit-to-CDU times. In addition, the project leader used aggregate data to track ED door-to-treatment-room times and LWBS for three weeks prior to opening of the CDU, and for the first three weeks post-implementation.

The Meditech electronic medical records system tracks length of stay (LOS) for clinical decision patients through MIDAS, a program that supplies the hospital with aggregate data monthly. The project leader compared LOS of clinical decision patients in a bed for three weeks directly prior to opening of the CDU with LOS of clinical decision patients in the new CDU for the first three weeks after it is opened. All data was analyzed using SPSS software.

Emergency room core metrics for patient length of stay, and left-without-being-seen data, are reported monthly from the Centers for Medicare & Medicaid Services (CMS). Data supplied by both Midas Health Analytics and CMS is “aggregate”; consequently, patient identification information is not linked to metrics and confidentiality is strictly maintained.

Intervention/Project Timeline

The intervention started with the introduction of the new guideline by the project lead to CDU staff and ED staff through unit meetings for each group, and during daily huddles done by charge nurses at the change of shifts. The project was be described in full to the ED and CDU staff, including education in inclusion/exclusion criteria and the pre-and post-surveys

were completed by participants to measure understanding of education provided. Privacy for participants was maintained; no identifying information was collected. The project leader developed an audit tool regarding use of CDU admissions (inclusion/exclusion) criteria and educated the CDU RNs on the use of the new audit form (Appendix B). The timeline for this project was six weeks and started in April, 2018: Staff education and 50 retrospective chart reviews before the implementation of the new protocol and 50 chart reviews after the implementation of the new protocol. The start of this project was delayed until April, 2018 due to a delay in the space being available for the CDU to occupy. Planning activities for this quality improvement project began in August 2017, after identifying a project chairperson and gaining assurance that the project would meet the DNP requirements. This project was aimed at implementation of best practice within a target population: Clinical decision patients.

A PDCA cycle was implemented for this project. Planning for this project was initiated at the request of the VP of Nursing, a key stakeholder the project leader has worked closely with in the development of the new CDU and its admissions protocol. After discussion with management, assessment and analysis of the hospital's established practice of placing clinical decision patients throughout the hospital (rather than in a dedicated CDU) was reviewed. Literature review and gap analysis were performed.

Timeline after IRB approval from Touro University Nevada, and from the project site IRB committee and approval to move forward with the project was obtained:

Week 1: Kickoff meeting to introduce project to key stakeholders. Attended unit meetings for ED, CDU and providers to communicate with and educate staff and providers on project. All staff and providers at the ED and CDU unit meetings were educated about the CDU

protocol and data collection tool. Initial survey completed by staff to measure effectiveness of education provided on CDU protocol.

Week 2: Presented revisions of protocol based on input from staff, providers and management. Led weekly meetings of project team. Implemented use of CDU protocol and data collection tool upon opening of CDU.

Week 3: Monitored activities and processes of intervention and lead weekly meeting of project team. Maintained ongoing communication with staff and providers regarding inclusion/exclusion criteria and revise as needed based on input from stakeholders.

Week 4: Continued study of effectiveness of implementation, modified criteria if required. Lead weekly team meeting.

Week 5: Continued to modify criteria as necessary. Led team meeting.

Week 6: Completed project, chart reviews, data analysis interpretation, final evaluation of effectiveness of protocol and disseminated results.

Ethics/Human Subjects Protection

Permission to conduct this project was submitted to Touro University Nevada Institutional Review Board (IRB) and to the hospital's IRB. Per IRB guidelines, the project met exempt status since it was considered a QI project. As a registered nurse, the project lead had a duty to protect the health, safety, and welfare of the public, as defined by the Nurse Practice Act. Prior to initiating the DNP project, written approval of the project proposal was obtained from the VP of Nursing at the hospital, and from the chair of the IRB board. Privacy for patients was maintained: No patient identifiers were collected when doing retrospective chart reviews. Privacy of staff was also maintained: No identifying criteria was collected from staff, neither when completing pre- nor post- tests on CDU admissions criteria. All staff participants were

assured of confidentiality and anonymity. Each staff participant was given a random code known by them alone, and unknown to the project lead. This guaranteed confidentiality when participants completed the pre-test, and again when they completed the post-test. Benefits to the staff for participating in training was the enhancement of their knowledge of CDUs generally, and specifically inclusion/exclusion criteria that was used to determine what patients will be admitted to the CDU (Hamrock, 2014). The nurse manager of the CDU and the nurse manager of the ED made CDU education mandatory for all staff; charge nurses in both units were empowered to assist with education of staff in their units. Risk to participants was minimal and limited to potential embarrassment due to lack of knowledge regarding the inclusion/exclusion criteria, and (potential) consequences from nurse manager for not completing mandated education. Staff completed CDU education on their work time. There was no extra compensation offered to staff for attending classes or participating in educational sessions.

Plan for Analysis/Evaluation

Upon completion of the DNP project, results from pre- and post- staff questionnaires were entered on an Excel spreadsheet. The spreadsheet was uploaded into SPSS statistical software for analysis. Normality was assessed using the Kolmogorov-Smirnov test and confirmed. A Wilcoxon signed rank test was performed to compare participants' survey responses pre- and post-education regarding CDU admissions criteria. The significance of differences in survey scores pre- and post-education was analyzed for both CDU staff and ED staff. A paired-sample t-test was used to explore the effectiveness of the education in increasing the staff's confidence before education (*time1*) and after intervention (*time2*).

ED door-to-treatment time by a provider and admission time-bed time was analyzed using retrospective chart audits of 50 clinical decision patients; specifically, admission to bed

times was compared for clinical decision patients admitted from the ED hospital-wide three weeks before the opening of the CDU with those same metrics for patients admitted to the dedicated CDU for the first three weeks after its opening. LWBS data for the ED was collected for the first three weeks prior to opening of the CDU and compared to the same metric for the first three weeks after opening of the CDU. Correlation analysis revealed the direction and strength of the correlation between these two LWBS variables (Pallant, 2016).

Analysis of Results

This DNP project included three major components: The development and education of admissions criteria for a CDU, opening of a CDU and four CDU metrics related to the effectiveness of the CDU. To assess the efficacy of educational intervention, a ten-question, multiple-choice test was administered to 52 participants. Each participant received two same-numbered copies of the ten questions, one marked pre- and the other post-test; confidentiality of all participants was strictly maintained. The test questions were designed to measure understanding of the CDU admissions criteria of participants prior to training on the CDU admissions criteria protocol (see Appendix C). Following the training of the CDU admissions criteria protocol each participant completed a post-education test. Following the data collection, an SPSS spreadsheet, *educdu.sav,* was created from uploaded data.

The difference in means of two variables in *educdu.sav — pretotal* and *posttotal —* measuring pre-education and post-education total scores, were analyzed using a paired samples t-test. The difference in means (-.442), t-value (-3.976), and two-tailed p value of .000 showed there were a difference in pre- and post-test means which was significant at the p = .01 level. In addition, the effect size statistic η^2 = .2366 and demonstrated unequivocally for the efficacy of CDU admissions education in improving the knowledge of the participants.

Paired-samples t tests for individual questions on the pre- and post-education, revealed a difference of means for question 4 was very significant (p = .005 and $\eta^2 = .142$), but none of the other questions was significant even at p = .05 level (see Appendix E). For three questions (numbers 2, 5, and 8), all 52 participants answered correctly on both pre- and post-education evaluations. Many of the prospective participants had engaged in informal discussions of CDU admissions policy over time prior to the education component, and the exceptional mean total scores of the pre- and post-education showed that there were 19.50 and 19.94. This demonstrated an effectiveness of the informal communications in imparting the essentials of short-stay units.

The efficacy of the education intervention was revealed in four metrics central to the purpose of the CDU: Percent of left-without-being-seen CDU patients; CDU length of stay; door-to-treatment times for ED patients; ED admit-to-bed times (Appendix D). Specifically, the DNP project implementation has been designed to reduce ED patient door-to-treatment times from a pre-implementation mean of 76.40 minutes to 60 minutes or less, percent left-without-being-seen (LWBS) ED patients from a pre-implementation weighted mean of 3.55% to less than 3.00%, and ED decision-to-admit times from a pre-implementation mean of 565.22 minutes to less than 150 minutes. Simple descriptive statistics were done to answer these questions using SPSS software.

The post-implementation LWBS goal of less than 3.00% was met. The results showed a score of 2.21%. The ED door-to-treatment time by a provider also showed improvement. The results showed there was a decrease from a pre-implementation mean time of 76.40 minutes to 17.02 minutes after CDU admissions criteria were in place. In addition, the goal of 60 minutes or less was met. Mean ED admit-to-bed time post-implementation decreased from a pre-

implementation mean of 565.22 minutes to 142.82 minutes. The results showed that the LOS dropped from a pre-implementation mean of 35.38 hours to a much-improved 12.12 hours under new CDU admissions guidelines and to 26 hours hospital-wide. All metrics, pre-and post-, were normally distributed, but for each one both mean and standard deviation decreased (Appendix F).

Discussion of the Findings

Traditionally, patients who require further evaluation and testing beyond the first few hours in the emergency department have been admitted to an in-patient hospital bed. Clinical Decision Units (CDU) or short-stay units are becoming common in hospitals because they provide an alternative to admission or discharge (Stang, et al., 2015). The ultimate goal of a CDU is to improve the quality of medical care for patients through extended evaluation and treatment, up to 24 hours, while reducing inappropriate admissions, length of stay, thereby improving ED throughput and reducing healthcare costs.

The results of the findings showed that 52 staff and providers were educated, pre- and post-admissions knowledge was measured, and test data were analyzed using paired samples. The difference in pre- and post-tests means was significant, demonstrating the effectiveness of CDU admissions education in improving the knowledge of CDU and ED team members. Baugh, Liang, Probst & Sun (2015) stated that it is essential that the ED and CDU staff and providers are educated regarding CDU admissions criteria, stressing the importance of strict adherence to the criteria. The two theoretical frameworks that guided this DNP project were the Donabedian model (Donabedian, 1966), and Rogers's diffusion of innovation theory (Rogers, 1995). The Donabedian model was chosen for this project due to its focus on quality care and outcomes. The model demands a thorough review of the CDU admissions criteria and its link with a process: Education of the CDU and ED staff, providers, and key stakeholders. The model used

structure, process, and outcome as standards to guide and monitor progress, making its evidence-based orientation ideal for this DNP project.

Everett Rogers's diffusion of innovation theory (Rogers, 1995) offered insight as a theoretical support for this DNP project and contributed crucial understanding of the types of behavioral changes observed in CDU and ED staff: innovators, early adopters, early majority, late majority, and laggards. The early adopters were instrumental in making implementation of the new CDU admission criteria successful. During the confirmation stage, nursing staff were continuously utilizing the CDU admissions criteria and communicating to colleagues (especially laggards and the providers) why the criteria needed to be followed.

The results revealed a decrease from a pre-implementation mean time of 76.40 minutes for door- to- provider to 17.02 minutes after CDU admissions criteria were in place and the CDU was operational. The CDU opening had a significant impact on this metric as did the other measures that were put in place by the ED medical director and the ED nurse manager: The ED medical director started assigning a provider to triage, to see patients sooner and to start treatment. This also helped to decrease door-to-treatment time for ED patients. The ED nurse manager took four additional agency nurses to help supplement staffing, which aided in patients receiving treatment sooner. Silverman & Choppa (2016) described the benefits for opening a CDU as follows: Decreased in-patient admissions, lower costs for patients and hospitals, decreased wait times for ED patients, decreased ED LWBS by a provider, and improved ED throughput.

The results showed a mean ED admit-to-bed time post-implementation which decreased from the pre-implementation mean of 565.22 minutes to 142.82 minutes. Though this was a significant improvement, further improvement in this measure could be realized if the admitting

hospitalist were to write the admission orders, and the history and physical, were not performed in the ED but in the CDU. Hamrock (2014) stated the ability to transfer patients quickly to CDU will decrease ED overcrowding, ED patient wait-times, and the percent of patients leaving the ED without being seen by a provider.

The results showed that the pre-implementation mean LWBS data was 3.55 % and the post-implementation mean was 2.21%. Several reasons can explain such a significant improvement in this ED metric: The CDU opening of 11 additional beds was significant; CDU staff actively pulled CDU patients from the ED to CDU to decrease the amount of time patients were in the ED freed up ED beds expeditiously for other patients; the ED medical director assigned a provider to triage to see the patient sooner and to start treatment. This also helped to decrease the ED LWBS patients. The ED Nurse Manager took four additional agency nurses to help supplement staffing, which also aided in patients being triaged sooner, further helping to decrease the percent LWBS.

The results showed that the LOS dropped from a pre-implementation mean of 35.38 hours to a much-improved 12.12 hours under new admissions guidelines for observation patients cohorted in the CDU. Baugh, Liang, Probst & Sun (2015) concluded in their Monte Carlo simulation reflecting current clinical practice that both observation status and where observation patients are managed are critical to clinical outcomes and overall costs for patients and hospitals. Silverman (2016) and Gabele (2016) both determined that clinical decision services provided in CDUs will decrease short-stay inpatient admissions, decrease LOS for these patients and decrease costs.

The outcomes element of the Donabedian framework consisted of the actual effect that the CDU opening and use of the CDU admissions criteria had on patients' overall status and

represents the combined effect of structure and process (Gabele, D. B. (2016). The Donabedian model is also used in the treatment of specific diseases, such as those specified in CDU admissions criteria, with the ultimate goal of improving quality of care provided in management of these diseases (Glickman et al., 2007). The Donabedian theory emphasizes that focus on metrics is essential. Four patient metrics that were measured pre- and post-project-implementation; the metrics displayed improvement post-CDU-implementation. The literature reported that LOS, ED throughput, wait times, patient outcomes, and patient satisfaction improve when CDU patients are cohorted in one area and clear criteria specify which patients are appropriate for admission to the unit (Hamrock, 2014, Stang, et.al., 2015, Ross, et. al., 2013, Baugh, 2011, Scrofine, 2014 and Hess, 2012).

In addition, the results showed that the majority of the patients were found to have met the CDU admissions criteria (90 %). When a patient was deemed no longer appropriate for CDU — the patient no longer met CDU admissions criteria —the charge nurse notified the provider to transfer the patient to another unit. The results showed that all metrics, pre-and post, were normally distributed (Kolmogorov-Smirnov statistic > .05), and for each metric both mean and standard deviation decreased (Appendix F) which suggested an increase in effectiveness and decrease in process variation. It is essential to continue to collect and analyze data, evaluate processes, and appraise the impact of the CDU admissions criteria. These actions will assist in determining the long-term effect that the CDU might have on ED throughput, observation patient's LOS, and patient outcomes. Taylor (2013) described the importance of collecting and analyzing data monthly and the importance of cycle iteration to improve outcomes.

Significance to Nursing

The development and use of CDU's is significant to nursing practice as it provides an efficient and cost-effective alternative to traditional inpatient services. CDUs prioritize streamlining care and discharging patients quickly (Bradas et al., 2016). In addition, the literature showed that CDU's provided focused care, dedicated staff, shortened length of stay, decreased rates of readmission, fewer inappropriate admissions, decreased cost of care, and reduced ED overcrowding (Barrett, 2012; Hamrock, 2014; Jibrin, 2008). This DNP project decreased LOS for the CDU patients, decreased the LWBS from the ED, decreased door-to-provider times in the ED, and decreased admit-to-bed times for the CDU patients. Throughout this project the nursing staff were actively involved in developing and updating the CDU admissions criteria protocol, communicating with the providers and the leadership team on an on-going basis regarding the opening of the CDU, and developing processes in the CDU to positively affect how care is provided to patients. Several studies of outcomes, supported the project findings for patients admitted to CDUs guided by specific admissions criteria, as opposed to patients admitted to traditional medical units, have reported shorter LOS, fewer hospital complications, and lower 30-day readmission rates (Bradas, 2016; Ross, et al., 2013; Stang, et al., 2015). Nurses and administrators will be able to use the information from this DNP project to improve patient and organizational outcomes.

Limitations of the Project

Several limitations of the DNP project were noted. The small sample size of the project may affect the results. This was evident in the number of pre- and post- chart audits completed which revealed the data of LOS and admit-to-CDU times. There were 50 admitted clinical decision unit patients. Another limitation of the project was the short time frame for

implementation of this project (due to delays in the unit opening) which resulted in a smaller sample size of LOS and admit-to- CDU data. However even though there was a small sample size, the results indicated that the project was successful in reducing the LOS of CDU patients, decreasing the LWBS of ED patients, decreasing the time it takes to complete an admission of a CDU patient to a bed, and decreasing door-to-treatment times of ED patients.

Lastly, a limitation of this project was the low number of ED staff and hospitalist providers who attended the education intervention. The results indicated that 100% or n=10 of the CDU staff completed the education intervention, 50% or n= 40 of the ED staff completed the education intervention due to staffing constraints in the ED, and eight hospitalists were educated on the CDU admissions criteria, but only two completed both the pre- and post- test. The results of the findings demonstrated the effectiveness of the education intervention. An education intervention which includes information on the CDU admission protocol is an effective method to improve the knowledge of the participants and increase the compliancy of implementing the CDU admissions criteria (Baugh, Liang, et al., 2015, Carpenter, Short, et al.,2015).

The project also included strategies which decreased the door to provider times. One of these strategies included the placement of a provider in the triage area during the hours of 11:00 a.m. -11:00 p.m. Also because of staff shortages four agency nurses were used to improve staffing and ED throughput. These measures used in the ED, along with a CDU with admissions criteria, contributed to the improvement of all project metrics.

The admissions protocol was reviewed and revised several times during the implementation phase of this project, which allowed for staff, administration, and provider input; occasionally, this caused some confusion over CDU admissions criteria. The project fostered practice changes at the site that correlated with positive outcomes for patients. The early unit

successes of the CDU are expected to continue and will be evaluated monthly by the department manager and the Director of Quality Management as a way of providing quality patient care and unit efficiency.

Dissemination

There are several strategies to disseminate the content of this project to a larger audience. After discussion with the VP of Nursing, the results of this project will be presented by the DNP project leader to the senior leadership, the medical executive committee, nursing supervisors, CDU and ED staff, project team committee, ED provider meeting, and hospitalist team meeting for further dissemination. A PowerPoint of the overview of the project results will be placed in the CDU communication/resource book as a way to further the education and knowledge of staff and shareholders. The project content will also be used in new CDU staff orientations. The continuation of this DNP project will be maintained by the project team, the VP of Nursing, and the nurse manager of the CDU, with assistance from the Director of Quality Management. The CDU Nurse manager will compile the data for the project monthly and share the data with the project team and senior leadership for analysis. CDU Admissions criteria will be reviewed and revised periodically by the project team to meet the needs of both patients and the organization. The results of this project will be disseminated to the wider public via a poster presentation at a future upcoming area health care conference and in manuscript form to a peer-reviewed academic journal for possible publication.

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Appendix A

Clinical Decision Unit (CDU) Criteria

Inclusion Criteria

This unit will care for patients whose length of stay is uncertain and with highly attentive care may be discharged within 24 hours. If they require a longer stay they will be admitted to an inpatient unit.

Recommended Admitting Diagnosis:

TIA
Syncope
Dehydration
Cellulitis
CHF
Chest pain (low risk, awaiting nuclear stress test in am).

Other Low Risk, potential CDU diagnosis

UTI
Pneumonia
GI Bleed
Headache/migraine
Gastroenteritis
Allergic Reaction

Global Exclusion Criteria

Anticipated discharge to a new facility or a higher level of care
Multiple comorbidities that may lead to increased LOS
Social issues that would complicate discharge (homelessness, acute intoxication, behavioral issues, suicidal, and patient's requiring a sitter)
Pediatrics
Unstable cardiac patients; patient with arrythmia's or positive cardiac enzymes

Assignment to the CDU

Patients who meet inclusion criteria will be accepted to the CDU by a designated hospitalist provider. ED physicians will contact the designated provider with appropriate admissions. All CDU patients will be admitted to the hospitalist service. Admission orders will be expedited by the hospitalist. As soon as we have orders, the CDU tech (if avail) will go transport the admission from the ED.

Appendix B

Medical Record Number	Diagnosis	Age	Observation Order Time	CDU Arrival Time	CDU Departure Time	Met CDU Inclusion/Exclusion Criteria?

Appendix C

Clinical Decision Unit Questionnaire and CVI

Purpose

The purpose of this questionnaire is to determine the knowledge, perceived knowledge, and attitude of the Clinical Decision Unit staff regarding CDU admissions criteria. The course will also provide education on notification responsibilities in the admission of CDU patients. It will additionally evaluate whether the learners' knowledge led to changes in practice behaviors after course completion. This will be measured using retrospective chart audits.

Learning Objectives

Upon successful completion of this course, you will be able to:

- Identify CDU admissions criteria
- Recognize when the CDU patient no longer meets CDU admissions criteria
- Define the RN's responsibility when the patient no longer meets the CDU criteria

Population

The population is staff and providers in a Clinical Decision Unit and an Emergency Room in Troy, NY.

Scoring Procedures to be Used

A separate answer sheet will then be used to develop a computer-generated item analysis report.

Item Format

The test will be a selected response multiple choice format.

Content	K	A	Total
Knowledge of CDU admissions criteria	6	3	9
Perceived knowledge of CDU criteria	1		1
Total	7	3	10

Clinical Decision Unit Pre-Questionnaire

1) **The goal when admitting a patient to the Clinical Decision Unit (CDU) is to provide expedient care to a patient in observation status whose admitting diagnosis necessitates a hospital stay of less than 24 hours.**

a) Strongly agree
b) Agree
c) Disagree
d) Strongly disagree

Answer: A
Rationale: The CDU is a short stay unit for patients who are being admitted to the hospital in observation status for 24 hours or less. The goal is to expedite the care and procedures provided to the patient to decrease length of stay.

2) **I have adequate knowledge of the criteria for admission to the CDU.**
   a) Strongly agree
   b) Agree
   c) Disagree
   d) Strongly disagree

Answer: All of the above
Rationale: This is a perceived knowledge question. How staff and providers react to the education provided on the CDU admissions criteria is affected by a number of factors, including their experience with observation patients and their acceptance of the admitting criteria.

3) **A patient suffering from an allergic reaction with stridor or evidence of impending airway compromise may be admitted to the CDU.**
   a) True
   b) False

Answer: B
Rationale: This is a knowledge question. Allergic reaction patients are excluded from admission to the CDU.

4) **A patient presents to the emergency department (ED) with syncope and an EKG that shows normal sinus rhythm. The provider examines the patient in the ED and orders orthostatic blood pressures every four hours, telemetry, and a neuro consult in the morning. This patient is an appropriate admission to CDU.**

.

   a) True
   b) False

Answer: A
Rationale: The patient meets admission criteria to CDU as there are no EKG changes.

5) **A patient with a respiratory rate above 40 or requiring a continuous nebulizer is an appropriate admission to the CDU.**

a) True
b) False
Answer: B
Rationale: This patient is unstable and does not meet criteria for admission to the CDU.

6) **A patient with chest pain and negative cardiac enzymes who is hemodynamically stable is awaiting a nuclear stress test in the morning. This person is an appropriate admission to the CDU.**

a) True
b) False

Answer: A
Rationale: This patient meets admission criteria for the CDU. The patient has negative cardiac enzymes and will be discharged or admitted after the nuclear stress test is done.

7**) The following statements indicate that the nurse understands what observation status means?**

a) The nurse tells the patient he/she can expect to be in the CDU for 2-3 days.
b) The nurse tells the patient there is no difference between inpatient and outpatient status as far as Medicare is concerned for coverage of services.
c) The nurse tells the patient that Medicare will pay for all tests, treatments, and services provided as an observation patient.
d) The nurse tells the patient that observation care is an outpatient service for patients who are too sick to go home but not sick enough to be admitted for up to 24 hours; observation status gives providers time to figure out what is wrong.

Answer: D
Rationale: The nurse explained to the patient appropriately that observation is an outpatient service. The patient is observed for up to 24 hours then either discharged or admitted.

8) A patient with seizure activity and persistent neurological deficits may be admitted to the CDU for observation

a) True
b) False

Answer: B
Rationale: This patient does not meet admissions criteria to the CDU as their condition is

unstable. The patient needs to be admitted to an inpatient unit.

9) **A patient in the CDU has a sudden decrease in blood pressure in the middle of the night and becomes confused.**

a) The patient has already been admitted to the CDU so the nurse would closely monitor the patient through the night and notify the provider in the morning.
b) The nurse would medicate the patient so the patient didn't keep other patients in the CDU awake.
c) The nurse will notify the Nursing Supervisor that a sitter is needed for the patient and closely monitor the patient throughout the night.
d) The nurse identifies that the patient no longer meets CDU criteria; the provider must be called and the patient needs to be transferred to an inpatient bed.

Answer: D
Rationale: The patient had a change in condition and is no longer meets the CDU criteria. The provider must be notified and the patient needs to be transferred to an inpatient unit.

10) **A provider calls the CDU nurse and says, "I am going to admit a chest pain patient to the CDU to rule out myocardial infarction. The patient's cardiac enzymes are negative but the patient has had short runs of ventricular tachycardia. I plan on performing a cardiac catherization on the patient in the morning." What is the most appropriate response for the nurse in this situation?**

a) "If you think this patient is appropriate for the CDU, we will accept them."
b) "I am sorry but this patient does not meet CDU admission criteria and is excluded from admission to the CDU due to their cardiac arrhythmia."
c) "I am calling my Nurse Manager to report you."
d) "That is fine. My shift ends in 15 minutes anyway."

Answer: B
Rationale: This patient does not meet the criteria to be admitted to the CDU. The patient is unstable and having a cardiac arrhythmia.

11) Additional questions or comments regarding the criteria for admission or exclusion from the Clinical Decision Unit.

Experts Rating Form Instructions

Rating instructions: For each item, please indicate the following:

Please rate how relevant each item is to the overall construct of the CDU criteria by placing a number in the first box to the right of each item.

1 = Not relevant at all

2 = Slightly relevant
3 = Moderately relevant
4= Highly relevant

Your honest feedback is appreciated and will be used to enhance the quality of this questionnaire.

Expert Rating Form

Item	**Relevance Rating**
The goal when admitting a patient to the Clinical Decision Unit (CDU) is to provide expedient care to a patient in observation status whose admitting diagnosis necessitates a hospital stay of less than 24 hours. a) Strongly agree b) Agree c) Disagree d) Strongly disagree	
I feel I have adequate knowledge of the criteria for admission to the CDU. a) Strongly agree b) Agree c) Disagree d) Strongly disagree	
A patient suffering from an allergic reaction with stridor or evidence of impending airway compromise may be admitted to the CDU. a) True b) False	
A patient presents to the emergency department (ED) with syncope and an EKG that shows normal sinus rhythm. The provider examines the patient in the ED and orders orthostatic blood pressures every four hours, telemetry, and a neuro consult in the morning. This patient is an appropriate admission to CDU. a) True b) False	
A patient with a respiratory rate above 40 or requiring a continuous nebulizer is appropriate for admission to the CDU. a) True	

b) False	
A patient with chest pain and negative cardiac enzymes who is hemodynamically stable, and is awaiting a nuclear stress test in the morning, is an appropriate admission to the CDU. a) True b) False	
Which of the following statements indicates the nurse understands what observation status means? a) The nurse tells the patient he/she can expect to be in the CDU for 2-3 days. b) The nurse tells the patient there is no difference between inpatient and outpatient status as far as Medicare is concerned for coverage of services. c) The nurse tells the patient that Medicare will pay for all tests, treatments, and services provided as an observation patient. d) The nurse tells the patient that observation care is an outpatient service for patients who are too sick to go home but not sick enough to be admitted; observation status gives providers time to figure out what is wrong.	
A patient with seizure activity and persistent neurological deficits may be admitted to the CDU for observation. a) True b) False	
A patient in the CDU has a sudden decrease in blood pressure to 78/50 in the middle of the night and becomes confused. a) The patient has already been admitted to the CDU so the nurse would closely monitor the patient through the night and notify the provider in the morning. b) The nurse would medicate the patient so the patient didn't keep other patients in the CDU awake. c) The nurse will notify the Nursing Supervisor that a sitter is needed for the patient and closely monitor the patient throughout the night. d) The nurse identifies that the patient no longer meets CDU criteria; the provider must be called and the patient needs to be transferred to an inpatient bed.	
A provider calls the CDU nurse and says, "I am going to admit a chest pain patient to the CDU to rule out myocardial infarction. The patient's cardiac enzymes are negative but the patient has had short runs of ventricular tachycardia. I plan on performing a cardiac catherization on	

the patient in the morning." What is the most appropriate response for the nurse in this situation? a) "If you think this patient is appropriate for the CDU, we will accept them." b) "I am sorry but this patient does not meet CDU admission criteria and is excluded from admission to the CDU due to their cardiac arrhythmia." c) "I am calling my Nurse Manager to report you." d) "That is fine. My shift ends in 15 minutes anyway."	

Content Validity Index Table

Item	Expert 1 (N. L.)	Expert 2(K.R.)	Expert 3 (J.C.)	Mean
1	4	4	4	4.0
2	2	1	3	1.8
3	4	4	4	4
4	4	4	3	3.67
5	4	3	3	3.33
6	4	3	3	3.33
7	4	4	4	4.0
8	4	4	3	3.33
9	4	3	3	3.33
10	4	4	3	3.33

The mean total of all the means was 3.41 indicating that all the questions were essential.

Appendix D

ITEM	VARIABLE CODE	RESPONSE
1.Percent of left-without-being- seen medical observation patients before CDU implementation	LWBSPRE	0.000 – 100.000
2. Percent of left-without-being- seen medical observation patients after CDU implementation	LWBSPOST	0.000 – 100.000
3.Length of stay (in hours) for medical observation patients before CDU implementation	LOSPRE	0-18
4.Length of stay (in hours) for medical observation patients after CDU implementation	LOSPOST	0-18
5.Door-to-treatment times (in minutes) for ER patients before CDU implementation	DTOTPRE	0-1000
6. Door-to-treatment times (in minutes) for ER patients after CDU implementation	DTOTPOST	0-1000
7. Admit-to-bed times (in minutes) before CDU implementation	ERTOBPRE	0-1000
8. Admit-to-bed times (in minutes) after CDU implementation	ERTOBPOST	0-1000

9. Identification number (position in list)	ID	1-50

Appendix E

ITEM	VARIABLE CODE	RESPONSE CODE	COMPLIANCE-SUPPORTING ANSWERS
1. The goal when admitting a patient to the Clinical Decision Unit (CDU) is to provide expedient care to a patient in observation status whose admitting diagnosis necessitates a hospital stay of less than 24 hours.	q1pre	1=Strongly Agree 2=Agree 3= Disagree 4=Strongly Disagree	1, 2=2 3, 4 =1
2. I have adequate knowledge of the criteria for admission to the CDU.	q2pre	1=Strongly Agree 2=Agree 3= Disagree 4=Strongly Disagree	1, 2=2 3, 4 =1
3. A patient suffering from an allergic reaction with stridor or evidence of impending airway compromise may be admitted to the CDU.	q3pre	1=True 2=False	2=2 1=1
4. A patient presents to the emergency department (ED) with syncope and an EKG that shows normal sinus rhythm. The provider examines the patient in the ED and orders orthostatic blood pressures every four hours, telemetry, and a neuro consult in the morning. This patient is an appropriate admission to CDU.	q4pre	1=True 2=False	1=2 2=1
5. A patient with respiratory rate above 40 or requiring a continuous nebulizer is appropriate for admission to the CDU.	q5pre	1=True 2=False	2=2 1=1

6. A patient with chest pain and negative cardiac enzymes who is hemodynamically stable and is awaiting a nuclear stress test in the morning is an appropriate admission to the CDU.	q6pre	1=True 2=False	1=2 2=1
7. The following statement indicates that the nurse understands what observation status means.	q7pre	1= The nurse tells the patient he/she can expect to be in the CDU for 2-3 days. 2=The nurse tells the patient that there is no difference between inpatient and outpatient status as far as Medicare is concerned for coverage of services. 3= The nurse tells the patient Medicare will pay for all tests, treatments, and services provided as an observation patient. 4= The nurse tells the patient that observation care is an outpatient service for those who are too sick to go home but not sick enough to be admitted for up to 24 hours; observation status gives providers time	4=2 1, 2, 3, = 1

		to figure out what is wrong.	
8. A patient with seizure activity and persistent neurological deficits may be admitted to the CDU for observation.	q8pre	1=True 2=False	2=2 1=1
9. A patient in the CDU has a sudden decrease in blood pressure in the middle of the night and becomes confused. What would you do?	q9pre	1 =The patient has already been admitted to the CDU, so the nurse would closely observe the patient through the night and notify the provider in the morning. 2= The nurse would medicate the patient so the patient didn't keep other patients in the CDU awake. 3= The nurse will notify the nursing supervisor that a sitter is needed for the patient and closely monitor the patient throughout the night. 4= the nurse identifies that the patient no longer meets CDU criteria; the provider must be called and the patient needs to be transferred to an inpatient bed.	4=2 1, 2, 3 = 1
10. A provider calls the CDU nurse and says, "I am going to admit a chest pain patient to the CDU to rile		1= "If you think this patient is appropriate for the	

out myocardial infarction. The patient's cardiac enzymes are negative but the patient has had short runs of ventricular tachycardia. I plan on performing a cardiac catheterization on the patient in the morning." What is the most appropriate for the nurse in this situation?	q10pre	CDU, we will accept them." 2= "I am sorry, but this patient does not meet CDU admissions criteria and is excluded from admission to the CDU due to their cardiac arrhythmia." 3= "I am calling my nurse manager to report you." 4= "That is fine. My shift ends in 15 minutes anyway."	2 = 2 1, 3, 4 = 1
11. The goal when admitting a patient to the Clinical Decision Unit (CDU) is to provide expedient care to a patient in observation status whose admitting diagnosis necessitates a hospital stay of less than 24 hours.	q1post	1=Strongly Agree 2=Agree 3= Disagree 4=Strongly Disagree	1, 2=2 3, 4 =1
12. I have adequate knowledge of the criteria for admission to the CDU.	q2post	1=Strongly Agree 2=Agree 3= Disagree 4=Strongly Disagree	1, 2=2 3, 4 =1
13. A patient suffering from an allergic reaction with stridor or evidence of impending airway compromise may be admitted to the CDU.	q3post	1=True 2=False	2=2 1=1
14. A patient presents to the emergency department (ED) with syncope and an EKG that shows normal sinus rhythm. The provider examines the patient in the ED and orders	q4post	1=True	1=2

orthostatic blood pressures every four hours, telemetry, and a neuro consult in the morning. This patient is an appropriate admission to CDU.		2=False	2=1
15. A patient with respiratory rate above 40 or requiring a continuous nebulizer is appropriate for admission to the CDU.	q5post	1=True 2=False	2=2 1=1
16. A patient with chest pain and negative cardiac enzymes who is hemodynamically stable and is awaiting a nuclear stress test in the morning is an appropriate admission to the CDU.	q6post	1=True 2=False	1=2 2=1
17. The following statement indicates that the nurse understands what observation status means.	q7post	1= The nurse tells the patient he/she can expect to be in the CDU for 2-3 days. 2=The nurse tells the patient that there is no difference between inpatient and outpatient status as far as Medicare is concerned for coverage of services. 3= The nurse tells the patient Medicare will pay for all tests, treatments, and services provided as an observation patient.	4=2 1, 2, 3, = 1

		4= The nurse tells the patient that observation care is an outpatient service for those who are too sick to go home but not sick enough to be admitted for up to 24 hours; observation status gives providers time to figure out what is wrong.	
18. A patient with seizure activity and persistent neurological deficits may be admitted to the CDU for observation.	q8post	1=True 2=False	2=2 1=1
19. A patient in the CDU has a sudden decrease in blood pressure in the middle of the night and becomes confused. What would you do?	q9post	1 =The patient has already been admitted to the CDU, so the nurse would closely observe the patient through the night and notify the provider in the morning. 2= The nurse would medicate the patient so the patient didn't keep other patients in the CDU awake. 3= The nurse will notify the nursing supervisor that a sitter is needed for the patient and closely monitor the patient throughout the night.	4=2 1, 2, 3 = 1

		4= The nurse identifies that the patient no longer meets CDU criteria; the provider must be called and the patient needs to be transferred to an inpatient bed.	
20. A provider calls the CDU nurse and says, "I am going to admit a chest pain patient to the CDU to rile out myocardial infarction. The patient's cardiac enzymes are negative but the patient has had short runs of ventricular tachycardia. I plan on performing a cardiac catheterization on the patient in the morning." What is the most appropriate for the nurse in this situation?	q10post	1= "If you think this patient is appropriate for the CDU, we will accept them." 2= "I am sorry, but this patient does not meet CDU admissions criteria and is excluded from admission to the CDU due to their cardiac arrhythmia." 3= "I am calling my nurse manager to report you." 4= "That is fine. My shift ends in 15 minutes anyway."	2 = 2 1, 3, 4 = 1
21. q1pre+q2pre+…+q10pre	pretotal	1-20	1-20
22. q1post+q2post+…+q10post	posttotal	1-20	1-20