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Evidence Based Protocol: Discharge Delays in the Acute Care Setting

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Chapter 1: Microsystem Assessment and Problem Overview

According to Batalden, Nelson, Godfrey and Lazar (2011, p, 25), the clinical microsystem is a "place where patients, families and health caregivers meet" and encompasses all interactions from the moment a patient enters the system up to and including when the patient leaves the system. In order to understand the complex and dynamic changes that occur at the microsystem level, a thorough assessment must be completed. The purpose of this chapter is to gain a greater understanding of the mechanism of the microsystem and the effects that this microsystem has on the process for discharging patients from the hospital setting into the community.

Microsystem Assessment

A thorough assessment includes a detailed review of the people, place and processes that make up the microsystem. For several months, this author delved into all three aspects of the microsystem. Information was gathered through informal interviews, clinical data review, and observation.

People. This clinical microsystem is comprised of patients, families, and healthcare professionals. Patients and families arrive at this clinical setting for many reasons. The majority of patients are admitted to this unit for elective joint replacement surgery. These individuals tend to be relatively healthy and their course of treatment is rather predictable. The average length of stay for patients is one to three days. The remainder of the patients admitted are medical patients whose course of treatment is not as predictable. These patients require comprehensive care for their comorbidities and complex psychosocial needs. The length of stay for these patients is often longer than the patients who underwent a joint replacement surgery.

The healthcare professionals caring for these patients comprise the interdisciplinary team. Team members include physicians, registered nurses (RNs), pharmacists, licensed medical social workers (LMSW), discharge planners, occupational and physical therapists, dieticians, and chaplains. RNs, physicians, and discharge planners are the focus of this chapter.

The RNs caring for patients in this clinical setting are primarily novice nurses. Of the 33 RNs working at this clinical setting, aproximately 25 have been practicing for less than 18 months. Through observations and informal interviews, the RNs appear to be a very engaged and enthusiastic group of clinicians who are passionate about the patients for whom they provide care.

There are several physician groups providing care to the patients at this clinical setting. This includes a group of orthopedic/trauma physicians who perform the joint replacement surgeries and provide post-surgical care. The other group of physicians include a hospitalist group and two resident physician groups. The resident groups are family medicine and internal medicine specialists.

The discharge planners at this clinical setting are primarily RNs. LMSWs are utilized when a patient's safety is a concern. The RNs help coordinate post-discharge needs such as home-care services and referrals to skilled nursing facilities if patients require sub-acute care services. The LMSWs help coordinate safe discharge plans when patients are in need of social services such as guardians or mental health services.

Place. This clinical setting is a 47-bed unit located on the seventh floor of the main campus at a large Midwestern hospital. This unit has recently undergone several physical changes. A large renovation and expansion of this unit took place over several months that changed the unit from a 24-bed unit to the 47 beds it now houses. The renovation changed the

unit from mostly semi-private to private rooms. Another major change was the decentralization of the original unit's nursing station.

Processes. The provision of care at this clinical setting utilizes many processes. These processes include, but are not limited to, admission, discharge, medication administration, shift change, and error reporting processes. For the purposes of this paper, the discharge process will be the focus.

As previously outlined, the key stakeholders in the discharge process include physicians, RNs, discharge planners, and the patient. Admission to this clinical setting is the starting point of discharge planning. The discharge planners gather information about the patient's home situation and usual level of needs. The physicians and RNs collaborate to provide care for the patient during his or her hospitalization. The physicians and discharge planners collaborate to develop a projected discharge date. The patient's role in discharge planning is dependent on how active they choose to be in the planning process. For example, this author witnessed a patient actively choosing which homecare agency would provide discharge care. Conversely, this author also witnessed a different patient deferring the choice of homecare agency to the daughter.

Most of the time, patients and healthcare providers seemed to be aware of a nonspecific discharge plan, such as a need for a rehabilitation services at a skilled nursing facility. Through observations, this author witnessed delays in discharging the patient the planned discharge date. For example, the patient would sometimes be surprised that he or she was leaving that day or the patient would be unable to leave due to lack of transportation for several hours. One source of delay often witnessed by this author was missing or incomplete sections of the discharge paperwork. RNs would have to call physicians for a correction or clarification. Formation of an

overall discharge plan appeared to happen routinely, but on the day of discharge, there were often delays in the systematic process for achieving the plan.

A thorough investigation of the microsystem of this clinical setting was necessary to gain a greater understanding of the complex and dynamic environment where patients, families and healthcare providers meet. The assessment focused on staff providing care, the patients receiving care and the processes used to deliver care. This author found a microsystem comprised of many disciplines who care for a diverse patient population using multiple complex processes. The microsystem has recently expanded in size and now accommodates a larger group of medical patients. A novice nursing force, in collaboration with many disciplines, delivers care at this clinical setting. One complex care process is the discharge process, which is often fraught with problems related to delays and workarounds.

Nature of the Problem

Many institutions are investigating the nature of discharge delays and evaluating discharge plan coordination in the hospital setting in order to improve the quality of care provided. According to Holland, Pacyna, Gillard and Carter (2016), the definition of a delay in discharge is when the discharge occurs after the time established by the patient and healthcare provider. The cost of these delays affects the patient, the hospital, and the community and are more than just monetary in nature.

Delays in hospital discharges increase a patient's risk of nosocomial infection, complications and distress (Holland, et al. 2016; da Silva, Valacio, Botelho & Amaral, 2014; Majeed, et al. 2012). Delays in discharge also increase costs to the hospital and limit bed availability for individuals entering the system (Holland, et al. 2015; da Silva, et al. 2014;

Majeed, et al. 2012). Hospital discharge delays vary between 11.9%-62% of hospital admissions (Holland, et al. 2016; da Silva, at al. 2014).

Discharging a patient more quickly is a complex hospital systems issue (Holland, et al. 2016). To understand the scope of this complex problem, the discharge process itself requires careful examination. Patients enter the hospital system through several entry points. These entry points include elective or unplanned surgical admissions, emergency department admissions, transfer from another acute care facility and, direct admission from a primary care provider. These modes of entry can influence the length of stay, expected course of treatment and discharge plan. Ou et al. (2009) found a trend existed between mode of entry into the healthcare system and type of delay that a patient would experience. For example, a planned surgical admission for hip joint replacement entails a rather straightforward course of treatment versus an emergency department admission requiring a work up and treatment for joint replacement due to a broken hip due to a traumatic fall. The patient whose hip was replaced, as a result of elective surgery, may not experience delays but the patient who fell may experience delays due to lack of bed availability in a rehabilitation facility.

Discharge delays occur because of faulty processes and a lack of clear-cut procedures that influence factors internal and external to the acute care setting, not because healthcare personnel do not want to discharge patients (da Silva et al., 2014; Ou et al., 2009). Internal reasons include the patient's medical condition, delays in consultations and diagnostic procedures, delays in results from diagnostic tests, inaccurate medication reconciliation and poor care coordination (da Silva et al., 2014; Ou et al., 2009; Wong et al., 2008). External reasons include lack of appropriate facility for continued care in the community (i.e.: rehabilitation or

psychiatric), lack of appropriate equipment necessary for discharge, lack of family or community support for the patient and lack of respite care (Ou et al., 2009).

The discharge process includes input from many disciplines. Those providing input include physicians, nurses, discharge planners, physical/occupational therapies, pharmacists, financial representatives, families and insurance organizations. All members of the team play a very important role in planning the patient's discharge. Of the many key stakeholders that comprise this interdisciplinary team, nurses possess the potential to improve the discharge process at this clinical setting.

Nurse's role. Nurses are in a prime role for affecting discharge delays because they are often the individuals completing the discharge and have a "comprehensive view of the complex interplay of protocols and processes that must take place before a patient exits the hospital" (Holland et al., 2016, p.18). As the professionals completing the discharge, nurses witness the many reasons associated with delays in discharge. As such, they play a pivotal role in identifying where in the process the delay occurs. With the aid of the clinical nurse leader (CNL) whose practice is grounded in process improvement and quality improvement, discharge delays can be fully understood and explored at this clinical setting (Harris, Roussel & Thomas, 2014). Evaluation of work processes through systematic reviews and evidence review is an ideal way to scrutinize and improve current practice (Harris et al., 2014).

Conclusion

The nurse is often responsible for explaining the delay in discharge and performing the extra steps to track down needed resources for the discharge to be accomplished correctly. These wasted steps do not add value to the patient's experience nor create an efficient process for discharge. In order to understand these wasted steps and streamline this process, this author will

collaborate with the RNs at this clinical setting. A data tracking method will be used to identify the types of delays experienced; the time wasted correcting the delay and whom the delay involved. This data will be categorized and prioritized with the goal of gaining a better understanding of a complex process. This author will then be responsible for utilizing Lean, a process improvement technique, to identify the root cause of the problem and subsequent process improvement efforts to create a more efficient and valuable discharge process.

Chapter 2: A Review of the Literature

In order to intentionally redesign and test processes, a deep understanding of the problem to be addressed must be gained. This knowledge journey begins with a focused review of literature to identify key sources of evidence. Three questions, which guided this literature review, are:

(1) Why is a coordinated discharge plan important?

(2) What creates delays in discharges?

(3) How can nurses, in conjunction with clinical nurse leaders, influence discharge planning?

Findings related to these questions have implications for nurses, nursing practice, and patients. A thorough search of the literature was performed using CINAHL, PubMed, and The National Guideline Clearinghouse databases. Key words for the search included "discharge planning", "care coordination", "discharge delay", "discharge", "hospital", "acute care" and "delay." Many results were identified regarding discharging patients from specialty units such as critical care units and pediatric units. For the purposes of this paper, information about discharging home and delays in discharge from the hospital were included in the literature

review. There was no information found on the National Guideline Clearinghouse about discharge planning or delays.

Discharge Planning

Discharge planning is the responsibility of a vast and evolving interdisciplinary team that involves physicians, nurses, social workers, pharmacists, dieticians, and patients/families. According to Preyde, Macaulay and Dingwall (2009) an "optimal discharge plan meets both a patient's medical and psychosocial needs in order to prevent recurrence" (p. 199). As such, creating a well-organized plan is beneficial to both those providing healthcare services and those receiving these services.

In a descriptive study of all Medicare inpatient and skilled nursing facility claims from 2000 to 2006, Mor, Intrator, Feng and Grabowski (2010) found that readmissions to the hospital within 30 days of discharge were costly. In 2006, there were 65,477 Medicare recipients admitted to a skilled nursing facility after discharge from an acute care facility in Michigan and 25.8% of those people were readmitted to the acute care facility (Mor et al., 2010). The cost of these readmissions in Michigan was $175.35 million dollars (Mor et al., 2010).

In a meta-analysis aimed at reviewing current literature regarding discharge planning, 3,327 studies were identified from 1995-2005. Of the thousands of studies identified, 25 randomized control trials were further investigated (Preyde et al., 2009). The intervention in these studies was an augmented discharge plan. Depending on the study, the augmented plan could include such interventions as a post discharge phone call, a post discharge appointment with a primary care provider or a visit from a home care nurse among other interventions (Preyde et al., 2009). Hospital length of stay, readmission rate, costs, quality of life, patient well-being, and patient satisfaction were the outcomes measured in these studies.

The authors found mixed results. In regards to hospital length of stay, only eight studies reported a significant decrease in length of stay for intervention groups. Only four of the studies described statistically significant decreases in readmission rates for those who received an augmented discharge plan. It was also found that if an augmented discharge plan affects readmission rates, it might only do so in the short term. Five of the studies reported cost savings in the intervention groups.

The study found that quality of life was significantly improved for the intervention groups. However, quality of life was only studied in the short term and is therefore inconclusive for effects on long-term outcomes of quality of life (Preyde et al., 2009). Improvement in functional status was statistically significant for the intervention groups in four studies. Interestingly, one of the studies found that after repeatedly measuring functional status, it was no longer statistically significant after 18 months for the intervention group when compared to those who received standard discharge planning.

This meta-analysis strongly suggests that discharge planning positively affects patient satisfaction. It was found that patients in one study were more likely to report that the discharge plan had been discussed with them prior to discharge (McInnes et al., 1999). Of interest, no evidence was presented to indicate a decrease in patient satisfaction. The authors state that "augmented discharge planning appears to have a robust effect on patient satisfaction and moderate effects on quality of life and hospital resources" (Preyde et al., 2009, p. 212).

In a particular qualitative study from Sweden regarding discharge planning, the researchers aimed to investigate discharge planning through the lens of complexity theory (Augustinsson & Peterson, 2015). Nine nurses in charge of discharging patients in a Swedish hospital were repeatedly interviewed to find the true nature of the discharge process. This study

is useful because the authors cite evidence that a standardized process for discharge planning was a disservice to the nurses. The authors suggest that nurses grapple with uncertainty, the unknown, and surprises when discharging patients. Augustinsson and Peterson (2015) suggest that the inherent complexity cannot be simplified by a standardized process that does not allow for a nurse to critically think through the problems that arise in order to organize each individual discharge process.

Developing a plan for discharge can vary in resource utilization and level of complexity. Several studies have compared a standard discharge plan with an augmented discharge plan and found that when additional resources are utilized, there is an increase in patient satisfaction, patient reported quality of life and use of hospital resources (Preyde et al., 2009). There is also an argument against the standardization of discharges due to the complexity of this process.

Delays

Many healthcare institutions strive to provide excellent care. An important factor of quality care is an efficient discharge plan with minimal delays. Because of this literature review, certain patterns emerged regarding discharge delays. Holland et al. (2016) dichotomized delays into two categories, which are either internal or external to the acute care organization. Majeed et al. (2012) suggest that further identification of such factors may help lead efforts to reduce excessive hospital stay. Waiting or delays is a major source of waste in healthcare and does not add value to the patient's experience (Hadfield et al., 2012).

Internal delays. Internal delays include factors specifically related to the acute care setting. One organization used a nurse led tracking system to identify delays in the discharge process that are unique to the acute care setting. This involved a real time data tracking methodology. Over an 8-month period, 114 patients experienced delays that totaled 23.6 days (Holland et al., 2016).

Upon further investigation, the most prevalent reason for delay was an incomplete discharge summary. This particular delay translated to an extra 4.5 hours of waiting before discharge (Holland et al., 2016).

Interestingly, this initiative also revealed other process issues associated with the discharge. There were often miscommunications among healthcare providers, missing or inaccurate prescriptions and inaccurate discharge instructions that led to delayed hospital discharge (Holland et al., 2016). The small sample size of 114 patients is a limiting factor of this study. There is no information regarding the patient population in this study. Of note, the participation in this study was voluntary. Because this was a quality improvement project, the results are not generalizable.

Another study identified discharge medication discrepancies as a possible contributing factor delaying discharges for patients in the acute care setting. This nonexperimental prospective study utilized a pharmacist to analyze 150 patients' medication lists prior to discharge. A medication discrepancy is defined as "any difference seen between the medications listed on the discharge prescriptions (along with those listed in the physician discharge summary) and the best possible medication history" obtained on admission by the emergency department nurse, resident physician and pharmacist upon admission to the hospital (Wong et al., 2008, p. 1374). Wong et al. (2008) found that 41.3% of patients had a medication discrepancy on their discharge list. One important limitation of this study is that only English speaking patients' medication lists were analyzed.

Another overarching theme identified in the literature for discharge delays included delays in testing, availability of test results and clinical decision making (da Silva et al., 2014; Majeed at al., 2012; Ou et al., 2009). This evidence was identified through chart review and pre-

experimental design studies. These studies were based in acute care hospitals in The United Kingdom, Brazil and Australia.

External delays. Many of the studies already uncovered external delays in conjunction with the internal delays. Holland et al. (2016) found that availability of transportation was a common issue. This included hospital coordinated transportation and family coordinated transportation from the hospital.

Ou et al. (2009), Napier et al. (2013) and Gigantesco et al. (2009) attempted to find a correlation between delayed discharge and patient population. Ou et al. (2009) found through a descriptive study using regression analysis, that patients were more likely to experience a delayed discharge if they lived alone, were elderly or were non-English speaking. Napier et al. (2013) compared total joint replacement surgical patients who stayed longer than 72 hours with those whose stay was less than 72 hours and determined that lack of social support increased the chances of delayed discharge. Gigantesco et al. (2009) utilized a descriptive design study to compare psychiatric patients who were discharged in under three months to those who stayed longer than three months. It was found that lack of housing and community support was associated with the patients who experienced a delayed discharge.

Delays in discharge from the acute care setting can be attributed to factors internal or external to the organization. Internal factors include medication discrepancies and incomplete or inaccurate discharge summaries. External factors include lack of post hospital care, which can include community support and social support.

Influence of Nurse's Role in Process Completion

As previously stated, nurses are at the bedside 24 hours a day and have an intimate knowledge of the patient and patient's health needs. For this reason, nurses play a key role in the

discharge planning process. As the responsibilities of the bedside nurse mostly encompass direct care for the patient at the microlevel, the clinical nurse leader (CNL), who is also positioned at the microlevel, can help lead the bedside nurse in coordinating care delivery (Harris at al., 2014; Hix, McKeon & Walters, 2009).

As already highlighted, the discharge process can be fraught with errors and misinformation that negatively affects the patient. In two studies investigating workarounds and rework for nurses, important information was uncovered. Workarounds and rework can be described as situations in which caregivers develop alternate work processes to by-pass real or supposed blocks in their workflow (Rathert, Williams, Lawrence & Halbesleben, 2011; Halbesleben, Savage, Wakefield & Wakefield, 2010).

Rathert et al., (2011) found in their cross sectional survey of 272 nurses in four intensive care units (ICUs) that rework and its associated exhaustion in the work environment can lead to work arounds. Exhaustion is a result of resource expenditure. This exhaustion and resulting work around practice can compromise patient safety and well-being (Rathert et al., 2011).

Resources can be inefficiently used to locate equipment, complete work and attempt to coordinate communication with other members of the interdisciplinary team. Conversely, it was found that those nurses who reported high levels of autonomy reported low levels of exhaustion. In light of these findings, Rathert et al., (2011) proposed that providing nurses more autonomy reinforces self-efficacy and therefore optimism.

Halbesleben et al., (2010) interviewed 58 nurses in four ICU settings in an effort to map the process for medication administration. The authors then compared the information gathered with observations of the medication administration process. A comparison of these data was performed and the process was mapped out in its entirety. Through this comparison study and

process mapping, Halbesleben et al., (2010) found that nurses developed work arounds when blocks in obtaining medications were encountered; rework was performed when communication barriers created blocks for obtaining medications. During the interview process, one participant stated that these work arounds and rework in the medication administration process often delays the administration of medication in a timely manner and could therefore influence the patient's length of stay (Halbesleben et al., 2010).

These two studies provide valuable information about process completion in the acute care setting. While not directly related to discharge delays, these studies do address how emotional exhaustion, errors, and rework are associated. As stated above, the discharge process can be hurried and this has the potential for errors. According to these two studies, when nurses encounter barriers in their work, a work around or rework may develop in order to circumvent the barrier. These work arounds and rework can prolong the process, and has the potential to increase a patient's length of stay.

The role of the CNL. According to The White Paper published by the American Asscociation of Colleges of Nursing (AACN) in 2007, the CNL is a team leader, advocate for the client, outcome manager, manager of information and proponent of quality improvement. Hix et al., (2009) attempted to quantify the role of the CNL in several settings. A pre/post implementation comparison study was performed in an ambulatory surgery unit, a surgical inpatient unit, a gastrointestinal laboratory, a surgical ICU and a transitional care unit. In all units, the CNL implemented a care improvement effort and all units realized a significant change in the care delivered.

For example, in the surgical inpatient unit, the CNL was able to decrease the amount of post-surgical blood transfusions for total knee amputation patients by 20% (Hix et al., 2009).

This positive change occurred through improved care coordination with physicians and implementation of a post-surgical transfusion protocol utilized by the nursing staff. The CNL has the education and skills to guide the team of bedside nurses in process excellence and improvement to better patient outcomes (Hix et al., 2009).

Conclusion

In conclusion, there is much evidence available regarding the fragmentation of patient discharges from the acute care setting. It is known that a coordinated discharge plan yields positive patient and hospital outcomes. Discharge delays are common and a result of reasons attributed to the acute care environment and the community environment. Bedside nurses and CNLs are key stakeholders in the discharge process and can positively influence the process for improvements.

Because of this literature review, it appears that a nurse led reporting system would be the optimal method to identify the process issues associated with the current discharge process. Identification of these gaps could influence rework and patient outcomes. Additionally, utilizing the expertise of nurses and CNLs could positively influence the discharge process by creating a more integrated process.

Chapter 3: Theoretical Context for Discharge Delays

Discharging patients from an acute care facility is a complex process that involves professionals from multiple disciplines (Holland et al., 2015). Due to this complexity, inefficiencies in the discharge process occur that can increase a patient's risk of complications and nosocomial infections. These inefficiencies can also increase hospital cost and limit bed availability while causing frustration for nurses attempting to complete the discharge (Holland et al, 2015; da Silva et al,, 2014; Majeed et al, 2012).

Lean

A quality improvement philosophy called Lean will be used to address this complex process. Lean was developed for the manufacturing industry, but has applicability to the healthcare industry because of the need for high quality care at low cost (Toussaint & Berry, 2013). The theoretical framework of Lean is based on six principles. Utilization of these principles transforms the culture of the organization and provide impetus for continual process improvement by teams of professionals, which will inevitably lead to improved value for patients and other key stakeholders (Toussaint & Berry, 2013). Of note, Lean philosophy uses several tools that aid in process improvement, including Plan-Do-Study-Act (PDSA), value stream mapping, and flowcharting.

Principle one. The Lean philosophy is grounded in the notion of continuous improvement throughout the entire organization. To achieve this, senior management must acknowledge the value of each worker and the importance of his/her respective viewpoints. Senior management must also realize the role of problem solver should ultimately fall on those who encounter the problem the most (Toussanit & Berry, 2013). This is not to be confused with a laissez-faire attitude. Rather, senior management should be in a position to coach and assist, instead of being the primary problem solver (Shook, 2008).

The theoretical model used for continuous quality improvement (CQI) is the Plan-Do-Study-Act approach adopted from Edward Deming (Toussaint &Berry, 2013; Worth et al, 2012) For example the worker responsible for filling the prescription order often receives a phone call from the nurse asking why the prescription has not been filled more timely. Instead of the worker going to his manager for a solution, the worker begins to study the process and implements changes with his manager's coaching. The worker finds that with his new approach

of changing the process to have the printer next to him print out labels rather than hand delivering labels, the prescription is filled faster.

The importance of the CQI approach is that everyone takes ownership for his or her work. As workers witness positive changes and increase their confidence in their problem solving skills, the momentum for improvement perpetuates (Toussaint & Berry, 2013). As continuous improvement is fostered from within the organization, the bar is set higher and the organization becomes more innovative which in turn benefits the key stakeholders (Toussaint & Berry, 20013).

Principle two. The Lean approach to CQI places emphasis on value (O'Neill et al., 2011; Toussaint, Gerard & Adams, 2010). Patients, physicians, nurses, healthcare organizations and communities realize this value (Toussaint & Berry, 2013). Value in healthcare is defined as "health outcomes per dollar spent and outcomes per dollar spent over time" (Toussaint & Berry, 2013, p. 76). Another way to define healthcare value is from the patient's perspective. Patients typically view healthcare value as something for which they are willing to pay (Toussaint et al., 2010).

The method utilized to grasp this information is value stream mapping. This tactic outlines each step in a process. Once the process is understood in minute detail, each step can be assessed for contributing value to the overall process (Toussaint et al., 2010). It is important to note that a value stream map is a robust form of flowcharting and no step is too small when assessing the process.

Principle three. Lean philosophy of CQI supports the idea of unity of purpose. As previously stated, the healthcare industry is a complex system. Therefore, individual workers can lose sight of what is most important (Toussaint & Berry, 2013). Lean keeps individuals on the path to

"True North". True North is a term used to denote the strategic priority of the organization (Toussaint & Berry, 2013). For example, an organization's "True North" may be patient safety. With this in mind, the desired outcome for all work is patient safety.

To keep individuals focused on the purpose, a tool called the A3 is utilized. The title "A3" denotes the size of the paper, but this paper is full of information regarding the process and the work being done to improve the process (Shook, 2008). The goals and strategies are also found on this. Senior leadership and frontline staff have access to the A3. Use of the A3 allows the organization to visualize the work completed and how the work evolved.

Principle four. A cornerstone of Lean philosophy is that those who do the work are respected as an integral part of the team (Worth et al., 2012). Lean is not a hierarchical system, but a system where frontline staff doing the work are the innovators with management trusting and supporting them (Toussaint & Berry, 2013). The role of the management team is to create an environment of empowerment and safety where the frontline worker can become an innovative problem solver (Toussaint & Berry, 2013). Management also regularly visits the worksite not in a supervisory role, but in a teaching role. It is also key that the management team is perceived as confronting faulty processes rather than staff performance in order to foster a culture of respect.

Management endorsing the PDSA model encourages staff participation in identifying and solving problems, since mangers coach and facilitate the process toward solutions. This facilitates the development of a team of innovators who respect and value each other's work.

Principle five. The Lean process relies on visual displays. Boards with information about ongoing process improvement efforts are displayed in high traffic as well as private areas for staff. These informational displays are often developed using sticky notes or dry erase boards to facilitate editing as more pertinent information needs to be added (Worth et al., 2012). The

location of the board is also purposeful, providing a gathering space for individuals to discuss information and bring concerns for further discussion. It also fosters a culture of transparency (Toussaint & Berry, 2013).

Principle six. The philosophy of Lean promotes flexible regimentation, which is a term, created by Robert Wilson, MD, meaning ongoing efforts are made to improve standard processes (Toussaint & Berry, 2013). First, processes must be standardized through tools such as PDSA (Worth et al, 2012). The advantage of creating standardized processes is that the work is efficient and when something falls outside the standard, it can be analyzed. For example, the standard of care dictates that discharge orders are always placed by 11 AM. When a nurse does not see an order for a patient at 11 AM, that nurse knows to investigate the reason why the discharge order is missing. The development of a standard of care streamlines the care so that clinicians have the necessary time to evaluate patients who does not fit the standard.

Lean is a process improvement philosophy grounded in continual process improvement. This process improvement is achieved through mutual respect and transparent work practices. Lean is an appropriate theoretical framework for discharge delays because of the complexity of this process along with the inclusion of many key stakeholders.

Define, Measure, Analyze, Improve, and Control (DMAIC)

The specific model for Lean is described through the acronym DMAIC. This stands for define, measure, analyze, improve, and control. The pronunciation is "duh-may-ick." According to DMAIC: The 5 Phases of Lean Six Sigma (2016), the acronym provides the five steps for problem solving.

The first step is to define the problem. Defining the problem is important because it allows people to grasp the nature of the situation, which is often a gap between the way

something is and what it should be (Worth et al., 2012). To describe the problem, there are delays and inefficiencies in the current discharge process at this clinical setting affecting many stakeholders, which includes patients, nurses and members of the hospital organization. To define the problem further, the author will survey the nurses to gain insight into how the problem specifically affects the patients and the nurses.

The second step is to measure the problem. Measuring the problem forces team members to identify and define key metrics while also providing baseline data (Rever, 2012). A map of the current process will be completed to understand the intricacies of the work being done. The author will work collaboratively with the nursing staff to identify specific challenges nurses face when discharging patients.

The third step is analyze. The purpose of analyzing the data is to uncover the root cause of the problem and decipher where wasteful steps occur (Rever, 2012). A root cause analysis will help delve into the cause of the problem.

The fourth step is improve. In this phase, development of a process improvement plan will be based on information found in the previous steps. The implement phase is important since different solutions can be developed and tested in order to determine the most effective intervention (Rever, 2012).

The final step in the process is control. This step is crucial to ensuring a smooth transition to the new process. It also provides the team an opportunity to analyze the process to ensure long-term success can be accomplished. The control step does not signal the end of the process improvement effort but rather a plan to continue tracking data so that drifting back to the old way does not happen (Rever, 2012).

The use of Lean philosophy promotes a culture of continuous improvement that involves all members of the work force, thus the author will not undertake this project alone. A team of nurses will actively participate in all phases of the project. The level of participation may be responding to a survey or participating in a work group. This team may include other members of the interdisciplinary team if necessary. Such staff may include case managers, social workers and/or physicians.

Utilization of DMAIC fulfills the six principles of Lean. The driving focus of this project is continuous improvement that creates value for the stakeholder. The purpose of this problem is clearly outlined yet flexible enough that the process will guide the work necessary. Visual aids utilizing such methods as the results from the root cause analysis and process maps will be used to keep stakeholders aware of the current state and ongoing efforts. Respect for the people who do the work is honored by their active participation in all phases of the process improvement effort.

Conclusion

The Lean philosophy is a process improvement philosophy grounded in innovative work. It provides a framework for managers and staff to creatively problem solve complex issues in a team-based atmosphere. The Lean philosophy is appropriate for this clinical setting's particular problem because the discharge process is a complex process. Application of the Lean principles will help achieve a full understanding of the problem and allow the staff responsible for the discharge to develop and implement a solution.

Chapter 4: Clinical Protocol

Discharging a patient from the acute care setting is a complex process involving many members of the interdisciplinary team. Executing a timely and accurate discharge plan is vital to

patient safety, hospital operations, and high quality care (Holland, et al. 2015; da Silva, et al. 2014; Majeed, et al. 2012). Utilization of Lean principles and the Define, Measure, Analyze, Improve, and Control (DMAIC) framework is appropriate for ensuring timely and accurate discharges in the clinical setting.

Lean is a process improvement philosophy founded in the manufacturing industry where benefits such as improved productivity and quality have been realized (McDermott & Venditti, 2015). Lean applies to the healthcare setting because of the demand for high quality care at a lower cost by communities, governments, third party payers, regulatory bodies, etc. (Nosbusch, Weiss & Bobay, 2010). DMAIC provides a systematic process outlining how to solve a problem (Rever, 2012). This chapter will outline the steps this author will complete in relation to the DMAIC framework.

Define

In order to understand a problem, it must be defined. This step will outline the scope of the problem. This author surveyed the nurses completing discharges. Based on the literature review, this survey, created by the author, will provide data regarding the nurse's perception of (a) the amount of time spent discharging patients (b) workarounds utilized in order to correct or finalize the discharge plan, and (c) what barriers nurses face when discharging a patient.

The survey consists of eight multiple-choice questions and one open-ended question and was distributed to all the nurses in the microsystem who provide direct patient care in an electronic form using the online survey distribution format known as Survey Monkey. The information obtained from this survey determined which population the author directed her focus for the rest of the clinical protocol. See Appendix A for survey.

Another facet of defining the problem is flowcharting the process. This flowchart includes all steps taken to complete a discharge for the population identified through the survey. This author directly observed nurses completing discharges. The observation started on the day of discharge. The author obtained the list of possible discharges from information provided by the case manager and bedside nurse in interdisciplinary rounds. Each of these potential discharges was observed by the author to gain an in-depth understanding of the complex discharge process. The observations consisted of the author shadowing the nurse after obtaining verbal permission. The author then created a process map based on observations.

Measure

To inform the author's process map and understanding of the current state of the problem, data will need to be obtained. The survey used to define the problem also contained questions to quantify the scope of the problem. The author gained a greater understanding of how many people believe a problem exists, the most frequent causes of delays and how much time is spent correcting the delays. See Appendix A for survey questions.

A**nalyze**

The author will form a workgroup including nurses and possibly members of the interdisciplinary team depending on the nature of the problem. The need for this work group will be short term. They will meet at least once and then determine if more work will need to be completed by the group. Permission for this group meeting will be obtained from the unit manager. If members of the interdisciplinary team are required, permission from each of their managers will need to be obtained.

This workgroup will then analyze the problem by closely examining the process. A root cause analysis is a tool that can be used to understand the nature of the problem on a deeper

level. In order to perform a thorough root cause analysis, a fish bone diagram will be utilized. All members of the team will contribute to this analysis to gain the perspectives of the many clinicians doing the work.

Improve

Once the root cause analysis has identified the cause of the problem, brainstorming will occur to procure a solution. The development of a solution is the responsibility of all members of the work group. This brainstorming session is a respectful endeavor where the consideration of all ideas will occur.

Once the solution is determined, the team will develop a detailed implementation plan. The team will rely on the hospital's policies and procedures to inform the proposed plan. Either the unit clinical nurse leader or manager will approve the plan. A discussion of logistics, preparation, documentation and communication plans will occur among the team members. Depending on the intervention, a few rapid cycle improvements may be necessary to tailor the final plan.

Control

The control portion of this iterative process is where the new process becomes the standard process. Plans will be made to ensure the new process solidifies and there is no drift back to the old way. Some methods utilized to achieve this include chart audits, staff feedback, and continued staff education.

Considerations

With any new process, there are multiple factors to consider. The microsystem assessment discussed in Chapter 1 outlines a newly expanded unit staffed by predominantly novice nurses who are caring for a clinically diverse patient population. These factors could

present challenges to process improvement efforts because clinical microsystems are ever changing and dynamic. The clinical microsystem is also a part of and influenced by the larger macrosystem and other microsystems.

Limited resources could also be a challenge for this project. This author is present on the unit the duration of 400 hours and will not be there in the long term to ensure sustainability. This author is also new to the staff, and therefore needs to gain the respect of those currently working in the clinical setting. Individuals involved in the project will also need time to participate. This could affect the unit's staffing budget. Any meetings that occur will have to be kept timely and produce worthwhile results to justify the members' time and allocated costs.

The complicated discharge process itself may present a major challenge. Through diligently reviewing each step, the process may be too large to restructure the entire process. Selecting one aspect of the problem related to discharge delays will focus the ptoject. However, it will be challenging since the discharge process is highly complex and the processes are integrated.

Lastly, the nature of utilizing the LEAN philosophy allows the change agent to grow and change with the process. This means that as the project evolves, the direction could completely change. This change in direction could impact the outcome and deviate from the plan outlined in this chapter.

Conclusion

The DMAIC process provides a structured approach for process improvement projects (Rever, 2012). The iterative five steps include Define, Measure, Analyze, Improve, and Control. After acknowledging the possible challenges this project could face, DMAIC is the most

appropriate framework to use for a complicated process such as discharges from an acute care facility.

Chapter 5: Clinical Evaluation

Implementation of Clinical protocol

Define. In order to thoroughly solve a problem; it is paramount that the problem be identified. This author, with constructive feedback from her clinical preceptor, developed a survey. The survey consisted of eight multiple-choice questions and one open-ended question. The author created an account with the online survey company Survey Monkey. A link to the survey was sent to all the RNs in the microsystem with a brief introduction to the survey.

This author did not receive any responses to the survey after several days. After speaking with a few random RNs on the unit about the survey, it was identified that the link was not working appropriately. At this time, the author needed responses sooner rather than later in order to define the problem with delays in discharges on the day of discharge. The author printed paper copies of the survey and began to distribute them to RNs during their workday. This author visited the unit for several days and at different times to obtain feedback from many people and from people who worked the night shift.

The author received a response from 27 nurses. Fifty-two per cent of them reported that the current discharge process was a problem and 100% reported that there is something missing when the patient is ready to leave. Forty per cent of the nurses reported that prescriptions or discharge instructions are the missing piece.

While distributing surveys to the RNs, the author was engaging them in dialogue regarding discharge delays and kept notes pertaining to the information and opinions gathered.

Based on the survey results and conversations with the RNs, the author was able to define the problem. When the discharge plan is for the patient to go to a subacute rehabilitation (SAR) facility, often times the prescriptions and/or discharge instructions are missing on the day of discharge.

Measure. In order to scope the problem, it needs to be measured. This author utilized the same survey used to define the problem to further scope the problem. The questions pertaining to nurses' time helped measure the extent of the problem. Sixty-seven per cent of nurses reported they spend at least thirty minutes correcting the missing piece from the discharge on the day the patient is discharging from the hospital.

Analyze. Once a problem is defined and measured, a thorough analysis the problem is necessary when attempting to improve a process. The author did not form a recognized workgroup because she was able to achieve the same results through various conversations and interviews with multiple members of the nursing staff. Through thematic analysis of the interviews and the survey results, the author determined that the cause of the problem was a knowledge gap.

The reason nurses were spending time obtaining prescriptions for patients who were discharging to SAR facilities was because they were unaware of which medications required a signed paper prescription. The author also did not use a fish-bone diagram for the root cause analysis because it was not the most appropriate tool because the author had already met with members of the nursing staff during the individual interviews. Instead, the "5 whys" tool was used to gain a greater understanding where in the process this knowledge gap existed.

By asking "Why?", the author was able to collaborate with front line nursing staff and providers to discover these individuals did not fully understand when a signed paper prescription would be required. Further inquiry with colleagues who work in pharmacy and care quality revealed that the process for e-scribing is not yet supported at this facility, and thus, any controlled substances require a signed paper prescription. However, there is not a clear understanding on the part of the nursing staff and providers, or the personnel at the SAR facilities, of which specific substances fall under the controlled substances category. This triggers the SAR facility to inquire of the nursing staff whether all the necessary prescriptions are present for the medications the patient requires, which is triggering the identified problem defined previously (see Appendix B for flow chart).

Regulatory agencies such as The Drug Enforcement Administration (DEA) and The Centers for Medicaid and Medicare (CMS) were also utilized as resources to determine federal laws governing prescription-writing regulations. Through researching the DEA and CMS websites, the author determined the process for prescribing medications is highly variable depending on whether the provider utilizes e-scribe or not. According to Electronic Prescriptions of Controlled Substances (2010), a prescriber is not required to e-scribe controlled substances, but rather has the option to participate. However, for a provider to elect to e-scribe, the facility itself must have a system in place that is able to accommodate e-scribing. If e-scribe is available and utilized, the provider will send all necessary prescriptions directly to the appropriate pharmacy instead of providing paper prescriptions to the SAR who then provide them to their pharmacy. However, if e-scribe is not available or utilized, all medications categorized as controlled substances require a signed paper prescription from the provider and must include a DEA number.

This acute care facility is unable to support e-scribing at this time. This has resulted in the expectation by front-line nurses that signed paper prescriptions will be included with the patient's discharge paperwork. The knowledge gap is directly rooted in the front-line staff not being aware of which specific medications would require a signed paper prescription. This uncertainty is then causing nurses to spend the additional thirty minutes verifying they are not missing the required signed prescription for any of the medications on the list within the discharge paperwork.

Improve. To improve the process for discharging patients to SAR, the knowledge gap identified in the analysis needs to be addressed. Nurses need to be aware of which medications require a signed prescription from the provider and need to be able to verbalize to the SAR facility that these prescriptions will be included in the discharge paperwork. If these two things can be achieved, nurses will theoretically be able to use the thirty minutes they previously spent verifying discharge prescriptions for more value added activities. These activities could include more time spent with patients providing care.

Because there was no recognized team to develop an intervention for informing the nurses about which medications require a signed paper prescription, the author utilized key stakeholders from the microsystem. These stakeholders included the unit pharmacist, frontline staff and members of the leadership team. By interviewing these individuals to obtain input regarding best education practices for this microsystem, the author determined that a multi-modal approach would be most appropriate.

The education topics were twofold. The first piece was that all controlled substances require a signed paper prescription. The second piece was a list of the most frequently prescribed medications at this microsystem that are considered controlled substances which include hydrocodone and oxycodone in the form of Norco™, OxyContin™ and Percocet™. The

author drafted an email that was approved by the leadership team to send to all nursing staff informing them of these two things. Another form of education deployed for the nurses included a poster in the staff work room with this information. Lastly, this author developed a short article that will be placed in the microsystem's daily shift huddle update highlighting this information. The author also plans to develop a short presentation to be given by her preceptor at the next unit staff meeting, which will occur after the author has completed her clinical hours at this microsystem.

Control. The last step for implementing a change is to ensure that the change is solidified. In order to confirm that this knowledge is retained, plans would need to be made to determine is nurses are still uncertain about which medications require a signed paper prescription when discharging a patient to SAR. The author will be unable to supervise this endeavor due to her completion of clinical hours at the microsystem.

There are two ways that this follow up could occur. The nurses could be surveyed again to determine if prescriptions are missing for patients who are discharging to SAR. The survey could also be used to assess nurse's knowledge regarding which medications require a signed paper prescription for patients discharging to SAR. The results of the survey should confirm that prescriptions are no longer the missing piece of the discharge paperwork when patients are discharging to SAR. The survey results would also confirm that nurses know which medications require a signed paper prescription when a patient is discharging to SAR.

The nursing staff could also be observed discharging patients to SAR to determine if the process has changed to eliminate the uncertainty of which medications need a signed paper prescription. The expected observation would be that the nurses spent less than thirty minutes obtaining missing prescriptions. The observer would also see that nurses were able to verbalize

to the SAR facility which medications in the patient's discharge paperwork required a prescription.

Implications for Practice

Successes and Difficulties Encountered

As a new person on the unit, the author first needed to immerse herself in the microsystem and gain the trust of the people who interact within the microsystem. This was completed through one-on-one conversation with staff, patients and people she encountered on a daily basis. Becoming an accepted member of the team created an environment which supported both this project and the author's efforts to be successful.

To use technology to gather data, the author attempted to use an electronic survey. The link provided to staff did not work properly and the author was faced with the difficulty of not having the data she required to begin the work. As a result, the author interviewed as many staff members as possible (n=27) to obtain the information she needed. This was considerably more successful than the original electronic survey.

The author was able to connect with staff and build on the relationship she had already established to gather more information. Had the electronic survey been used, the author would have had anonymous answers that were limited to the nine questions asked in the survey. Because the author gave printed surveys to individuals, they were able to ask questions and begin dialoguing about the discharge process. The author was also able to further explain the reason for all the questions and the aim of the project.

The data the author gathered through the survey was quantitative and qualitative in nature. This was important to the project because the author was able to quantify the problem

and obtain information regarding the staff's perspective regarding how the discharge process works. These conversations and observations contributed greatly to the author's process map.

The original plan included a formation of a multidisciplinary team to solve this process issue. As a result of the individual conversations and observations, the author was able to gather all the necessary information without forming a team. This is important because forming a team would have brought up issues related to budget concerns because the team would have needed to meet outside of normal working hours. The individual conversations and observations by the author were budget neutral and did not require extra time of the staff.

Project Sustainability and Limitations

Ensuring that a project is sustainable can be challenging. This author will no longer be present in the microsystem and therefore will be unable to ensure sustainability. Therefore, plans to hardwire this knowledge have been discussed with the author's preceptor who will continue to monitor the discharge process and investigate any delays that occur. She will also be responsible for continuing to educate the nursing staff regarding which medications require a signed paper prescription.

As this microsystem changes, the information and education provided to the nursing staff will need to change as well. Currently, the organization is preparing to introduce a process that allows providers to e-scribe. At that time, the knowledge provided by this author will be less relevant; the staff will need new knowledge regarding e-scribing and how that process will impact the discharge process.

As discussed in previous chapters, the discharge process itself varies and is influenced by many factors. The education and knowledge provided to staff, while useful, may not completely

change the discharge process enough to make a significant impact in delays. While delays may not be improved, the nurse's time could be used more effectively. The nurse may no longer be spending time obtaining correct prescriptions for patients discharging to SAR and instead be using that time to complete value added care to the patient such as education and safety.

Conclusion

In the acute care setting, the discharge process can often be complex, variable and fraught with errors. Utilizing the Lean philosophy to examine the discharge process, clinicians are better able to understand what steps in the discharge process can create errors. The application of Lean principles also allows clinicians to scope a seemingly complex problem in order to begin the process of change. As a new person on the unit, the author was able to fully understand a large and complex problem while using evidence based tools to determine how to best change an aspect of the problem that has the potential to positively impact the use of nurse's time.

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Appendix A

Discharge Delays Survey

1. What shift do you most commonly work?
    a. Day
    b. Night
    c. Variable
2. Is the current discharge process problematic?
    a. Yes
    b. No
3. Which types of patients have the most complicated or time consuming discharges?

    Patients covered by:
    a. Internal medicine residents
    b. Family medicine residents
    c. Hospitalists
    d. Orthopedic surgeons
    e. Surgical residents
4. What avenue do you utilize to determine day of discharge for each patient?
    a. Verbal shift report/hand-offs from nurses
    b. Conversation with rounding physician
    c. Interdisciplinary rounds
    d. Patient/Family
    e. Electronic medical record notes from case manager or physician
    f. Other_____

5. Is your patient ever ready for discharge, but you find yourself scrambling to complete a mission piece (such as a prescription, ride, etc.)
    a. Yes
    b. No
6. If yes to the above question, what is missing?
    a. Paper prescriptions/medication reconciliation
    b. Ride home
    c. Ambucab scheduled for later in the day
    d. Discharge order in electronic medical record
    e. Incomplete or inaccurate discharge instructions
    f. Waiting for test results
    g. Other_____
7. What avenue do you most commonly utilize to resolve the missing pieces?
    a. Numeric paging
    b. Text paging the provider
    c. DocHalo communication with provider
    d. Provider office call
    e. Waiting for provider to round/search for him/her on the unit
    f. Other_____
8. How much time do you spend correcting the missing piece?
    a. Less than ten minutes
    b. Thirty minutes
    c. Over and hour

9. What do you feel is the biggest barrier to discharging patients in a timely manner?

Appendix B