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Applying Process Standardization and Health Literacy Precautions to Increase Older Adult Patient Satisfaction with Medication Teaching

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Chapter I: Introduction and Background

It is estimated that patients over 65 years are seven times more likely to be hospitalized due to an adverse drug event than the rest of the population (Robinson, Howie-Esquivel, & Vlahov, 2012). A study found that 27% of older adult patients discharged from acute care hospitals do not understand their medication instructions five days post-discharge (Albrecht et al., 2014). When patients are discharged from the hospital without a good understanding of their medications, they are more likely to take medications incorrectly, resulting in recurrence of illness, increase health care utilization, adverse drug events, and, in some cases, death (Chan, Wong, So, Kung, & Wong, 2013; Modig, Kristensson, Troein, Brorsson, & Midlöv, 2012; Nelson, Reid, Ryan, Willson, & Yelland, 2006; Wu et al., 2013). Older adults, 65 years and older, are at especially high risk for mismanaging their medications after being discharged from the hospital due to increased odds of having inadequate health literacy, polypharmacy, and multiple medication changes during hospitalization (Morrow & Conner-Garcia, 2013; Shapiro et al., 2017). Patients that have inadequate health literacy or greater than four medication changes have an increased likelihood of taking their medications incorrectly, leading to adverse drug events and readmissions (Mixon et al., 2014; Shapiro et al., 2017). Patients that have a better understanding of their medication regimens are more likely to correctly manage their medication after discharge, therefore, minimizing harm to themselves and decreasing health care costs (Lindquist et al., 2012).

The purpose of this paper is to describe a quality improvement (QI) project with the goal of creating an evidence-based, standardized process for nurses to teach older adult patients about newly prescribed medications. To address health literacy, the project will utilize universal health literacy precautions. This is the practice of assuming all patients may have difficulty

understanding health information and using educational tools that can be understood even by patients with low health literacy (Registered Nurses' Association of Ontario [RNAO], 2012). This project will take place on a 32-bed, acute care, senior care unit (SCU) in an urban hospital. The goals of the project will be accomplished through the following steps: 1) examination of the clinical microsystem, 2) investigation of the clinical problem, 3) identification of gaps in practice, 4) identification of possible interventions through exploration of the literature, and 5) implementation and evaluation of a QI project. This project will be carried out by a Master of Science in Nursing (MSN) student under the supervision of university faculty and a Clinical Nurse Leader (CNL) who works within the microsystem. The overall aim of this project is to increase patient safety, improve patient satisfaction, and decrease health care costs by optimizing older adult patients' understanding of their medications. This will be accomplished by standardizing a process for teaching patients about their newly prescribed medications using evidence-based teaching practices.

The Clinical Microsystem

The clinical microsystem for this QI project is a 32-bed, acuity-adaptable SCU at an urban hospital in West Michigan. The vision of the SCU is to deliver patient-centered care with a focus on maximizing the function and independence of older adults. This is carried out by a healthcare team with specialized knowledge in the unique care of older adults. The guiding principles of daily practice on the SCU include: safety first; maintain and improve function; calm, relaxed, unhurried environment; minimize unit transfers; shared team-approach where all patients are our patients; make time to listen, know and value the patient's story; and families are actively involved and included.

Patients on the SCU are admitted with many different diagnoses and varying degrees of

acuity but they all share one commonality—they are 65 years or older. Treatment plans and transitional care of the older adult creates unique challenges. In line with the guiding principles and aim of the unit, the patients are discharged with resources to optimize their independence and ability to function. Although some patients are discharged to nursing facilities, including short-term rehabilitation, most patients are discharged to home, estimated at 70% (see Figure 1). When a patient is discharged to home they must be able to incorporate medication changes into their prehospitalization medication regimen.

Medication teaching is one of the major processes performed on the SCU that can impact patients' ability to self-manage their medications. Currently the process of teaching patients about new medications has vast variability and nurses report the process as cumbersome and time consuming (see Figure 2). Additionally, a survey of nurses on the SCU showed 76% report that during a busy shift, teaching patients about new medications takes low priority compared with the other aspects of care and often does not occur. This process is problematic and would be an ideal place to focus improvement efforts within the microsystem since it is vital to older adult patients successfully discharging home.

The Clinical Problem

Identification of a clinical problem serves as the basis for QI efforts (Thomas, 2014). The CNL identifies clinical problems through thorough assessment of the microsystem (Thomas, 2014). Once the potential clinical problem is identified, it is further explored by studying the process and performing a root cause analysis (Smith, 2014). For this project, the clinical problem is that older adult patients do not feel informed about their medications. The following section will discuss how this problem was identified, why it is important to address, and why this problem occurs within the microsystem.

Identification and Significance

When older adult patients do not feel informed about their medications it not only has the potential to impair patient outcomes but also has the potential to negatively impact the hospital financially (Chan et al., 2013). The primary data that supports this finding is the unit specific results of the Hospital Consumer Assessment of Healthcare Providers and Systems survey (HCAHPS). HCAHPS is a patient experience survey that is publicly reported and connected to value-based reimbursement from the Centers for Medicare and Medicaid Services (CMS; 2015). Low HCAHPS scores decrease the value-based reimbursement the hospital receives from CMS (CMS, 2015). The SCU's mean score for the effective communication about medicines domain was under the 50th percentile for fiscal year (FY) 2017 (see Figures 3, 4, and 5). The overall hospital scores for the communication about medicines domain is lower than both the state and national averages according to the Medicare hospital compare website (Medicare, 2018). In the care transitions domain, the mean response to "When I left the hospital, I clearly understood the purpose of taking each of my medications," was also under the 50th percentile benchmark (see Figure 6) (CMS, 2017, p. 4). When compared to other inpatient medical units in the hospital, the SCU was the lowest scoring unit in the for this question in FY17. Communication regarding medications has been a consistent problem for the SCU with mean scores for both domains below the 50th percentile for FY2012-17.

There are many anecdotal examples of this problem that have been observed on the microsystem. One patient stated to the unit director that he did not feel informed about his care and medications. When the director asked why, the patient explained that he was hard of hearing and the staff talk too quickly for him. He continued to explain that even when he did hear, he did not fully understand. In another example, during a discharge teaching session, a patient was so

anxious about the amount of information she was receiving that she was tearful. The patient kept expressing that she was unsure if she could remember all the information. Despite the patient's concern, the nurse continued through the discharge instructions. These narrative reports echo the HCAHPS findings and shed light on some of the root causes of the clinical problem such as age-related sensory deficits and complex learning materials.

Narrative reports of this problem support the data presented in the HCAHPS results. These narrative reports were collected while talking and rounding with bedside nurses during the initial microsystem assessment. For example, during communication with nursing staff on the unit, a nurse expressed frustration about patients feeling informed. The nurse went on to report they do not have enough information, time, or resources to adequately address the educational needs of older adult patients. This idea of not being able to teach older adult patients came up during several conversations with bedside nursing staff.

Chart audits and a nurse survey show that medication teaching is happening far less frequently than hospital policy requires. While hospital policy requires medication teaching to be documented once per shift, an audit revealed that documentation of new medication teaching only occurs 3% of the time. While rounding on nursing staff, all the nurses agreed the medication teaching process is problematic. Some nurses even reported that they did not teach patients about any medications until discharge as they do not see it necessary to teach patients about a medication unless it will be continued after hospitalization. During an informal audit of patients on the SCU, 18% of patients reported they did not have adequate information regarding their medication. These numbers clearly demonstrate that the process of teaching patients about new medications is a problem on the SCU.

When patients are discharged home without understanding their medications, they can

have health problems which could lead to a negative financial impact on the SCU due to unplanned readmissions. As discussed previously, patients that do not understand their medication tend to take medications incorrectly after discharge (Lindquist et al., 2012). One study found that 56% of older adult patients had at least one discrepancy between their hospital discharge list and their home medication use within 48 hours of discharge (Lindquist et al., 2012). It is estimated that patients over 65 years are seven times more likely to be hospitalized due to an adverse drug event than the rest of the population (Robinson et al., 2012). With high risks to patients, the financial burden of readmissions, and decreased value-based reimbursement, it is imperative that the SCU address the process of teaching patients about new medications.

Root Cause Analysis

To find the solution to a problem, the process must be studied to find barriers and variability (Smith, 2014). A process riddled with variability and difficult steps produces inconsistent results (Godfrey, Nelson, & Batalden, 2011). The execution of a root cause analysis on why new medication teaching is a problematic process on the SCU revealed several issues. The first problem is the current process for new medication teaching is time consuming and difficult. For example, the educational handouts are not readily available. It takes multiple mouse-clicks to access the medication handouts. Then the nurse must print the medication handout, figure out which printer it printed to, walk to the printer, and then walk back to get the medication. Next, there is no standard process resulting in variable approaches from nurses on format, delivery, frequency, and depth of education.

Another problem is the medication handouts are too long and too complex for patients with limited health literacy. Currently, there are three different medication handouts available for nurses to provide to patients. The medication handouts provided by the EHR are an average of

3.2 pages in length, have 12-point font size, and are on average written at an eighth-grade reading level. The hospital staff also have access to Lexicomp which provides handouts that are written at a fourth-grade reading level but are an average of 4.4 pages and print at 10-point font. The sheets made by the hospitals pharmacy are 1-page, 20-point font, and written at an average of seventh-grade reading level. It should be noted that clinical practice guidelines from RNAO, the Agency for Healthcare Research and Quality (AHRQ), and CMS caution against using readability or grade level as the primary measure for usability and comprehension (AHRQ, 2010; CMS, 2010; RNAO, 2012). Readability measures are often unreliable, imprecise, and overlook many other factors—such as simplicity, format, and design—that contribute to reading comprehension (CMS, 2010). The pharmacy prepared 1-page medication handouts not only follow guidelines for teaching patients with limited health literacy but also improves ease of reading for older adult patients by using headings, short bulleted lists, and large san serif font (CMS, 2010). These pharmacy handouts are great tools to use on the SCU, but they are difficult to access, and many nurses are unaware these handouts exist.

Project Overview

The QI project to improve new medication teaching will focus on three components: creating a standard process, using the simplified 1-page medication handouts from the pharmacy, and using the evidence-based practice of *teach back method*. Standardization of a process is key to producing consistent results (Godfrey et al., 2011). The current process for new medication education has many barriers and vast variability. The nurses report that they find it difficult and time consuming to access educational handouts and adequately teach patients. The goal of standardizing and simplifying the process of new medication teaching is to increases the ease and likelihood that it will be completed.

The standard process for new medication teaching will include the use of medication handouts that follow universal health literacy precautions. Basic and below basic health literacy is more common in the elderly and is associated with decreased understanding of medications (Jones, Treiber, & Jones, 2014). The simplified medication handouts created by the pharmacy department are a 1-page handout that use simple language and limits information to the most important details about the medication. The goal of utilizing these handouts is to improve patients' understanding by implementing universal health literacy precautions.

The standard process will conclude with the use of the teach back method. Teach back is a method where the nurse teaches the patient and then has the patient describe what they learned (Morrow & Conner-Garcia, 2013; RNAO, 2012). The nurse assesses patient learning based on their explanation (Morrow & Conner-Garcia, 2013; RNAO, 2012). This gives the nurse time to reinforce learning and clarify misunderstanding (Morrow & Conner-Garcia, 2013; RNAO, 2012). Teach back has been used in many clinical situations to help improve both recall of information and reduce adverse outcomes such as readmissions (Centrella-Nigro & Alexander, 2017).

QI Framework

Frameworks from the QI literature are used to guide improvement efforts and focus change on systems instead of individuals (Hughes, 2008). After exploring several frameworks, the DMAIC (Define, Measure, Analyze, Improve, Control) method was selected as the framework to guide this QI project (Furterer, 2014). The clinical problem—patients do not feel informed about their medications—involves the process of new medication teaching. During the initial exploration of the problem, it was identified that there was a vast amount of variability in how nurses teach patients about their new medications. The purpose of DMAIC methodology is

to improve efficiency and eliminate variability from a process, making this and ideal QI framework to approach this clinical problem (Furterer, 2014).

Stakeholders

The primary stakeholders in this QI project are the bedside nurses, patients, pharmacy, and leadership on the SCU. Buy-in from leadership can be gained by presenting current data regarding the lack of new medication teaching and tying the project to the strategic aims of the hospital. Buy-in from bedside nurses will be more difficult as they feel overwhelmed with their workload without the addition of a new process. One way to develop bedside nurse buy-in is by gaining the support of early adopters and highlighting that the new process will make the task of teaching patients easier. The new process will be developed with feedback from the Patient Experience Committee for the SCU ensuring the process is made to fit the workflow of the bedside nurse. The Patient Experience Committee is a group of bedside nurses from the SCU that implement projects to increase patient satisfaction with hospitalization. Pharmacy supports the use of the simplified medication handouts but getting buy-in to devote pharmacy resources to creating more handouts for medications without a handout could prove difficult.

Facilitators and Barriers

When implementing a QI project, it is important to look at the potential facilitators and barriers to completing the project within the microsystem (Thomas, 2014). One barrier is the heavy workload of bedside nurses. Medication teaching continues to be a low priority when compared to the other aspects of patient care. Convincing beside nurses that teaching patients about their new medication is a priority will be a barrier to successful implementation. A second barrier is there is not a simplified medication handout available for every medication and these are only available in English. To sustain this project, pharmacy will need to create handouts for

additional medications. If a pilot of the project proves successful, the pharmacy may see it beneficial to create handouts in other common languages to improve outcomes for vulnerable non-English speaking populations. Facilitators of this project include a culture of continuous improvement, alignment with strategic goals of the organization, and support of the leadership team, including the CNL.

Feasibility

This QI project is a low-tech and low-cost intervention to improve a process that can have a large financial impact by decreasing 30-day readmissions and increasing reimbursement from CMS. There is minimal equipment or purchasing needed to implement this project. The process of new medication teaching is an expected task for nurses—not an additional task being added to the nurses' workload. To accomplish this QI project, staff support and feedback will be a valuable tool. One foreseeable challenge is getting pharmacy on board with creating simplified medication handouts for medications that do not have handouts. The second foreseeable challenge will be the existence of an education policy that specifies usage of the medication handouts provided by LexiComp. Despite some challenges, this QI project is a low-cost, low-effort project that has the potential to decrease costs and improve patient outcomes.

Conclusion

The purpose of this chapter was to introduce the microsystem, clinical problem, literature, and to give and overview of the QI project. Subsequent chapters will describe each of these topics in more depth. Implementation of an evidence-based standard process for new medication teaching can increase older adult patients' knowledge and satisfaction. This project will be implemented on the SCU and has the potential to improve patient outcomes, decrease 30-day readmissions, and increase value-based reimbursement from CMS. This QI project is ideal

for a CNL student to implement as it focuses on process, increases patient safety and satisfaction, and decreases the workload of the bedside nurse.

Chapter II: Literature Review

At the core of the CNL's practice is the ability to search, critique, and engage the literature to produce evidence-based changes within the clinical microsystem (Clanton, 2014). After identification of a clinical problem, the CNL performs a root-cause analysis of the problem within the microsystem and then looks outward to the literature for evidence-based ways to make improvement (Priefer, Taylor, & Alt-White, 2014; Wilkinson, 2014). It is important to remember the CNL's role is not to generate new knowledge through research but to harness existing knowledge and translate it into QI projects that address problems specific to the clinical microsystem (Priefer et al., 2014; Wilkinson, 2014). This chapter will describe the process of searching and critiquing the literature to address the clinical problem of patients not feeling informed about their new medications to guide a QI project on a SCU.

Review of the Literature

A PICOT (population, intervention, comparison, outcome, time) formatted clinical question provides an efficient method for searching databases and produces relevant results (Melnyk & Fineout-Overholt, 2015). The process of a PICOT search involves identifying the population, intervention, comparison, and desired outcome, and then searching for the terms in healthcare databases (Melnyk & Fineout-Overholt, 2015). For this clinical question, older adults are the population, medication teaching is the intervention, and satisfaction and knowledge are the outcomes. The PICOT question used in this search was: In older adults does simplified medication teaching improve satisfaction and understanding compared to the standard medication teaching. In order to see what knowledge is available, a literature search guided by the PICOT question was completed. CINAHL, Cochrane Library, and PubMed were searched using different combinations of the terms "geriatrics or older adults or elderly", "medication

education", "patient information leaflet", "health literacy", "medication", "written materials", and "medication leaflet". Additional articles were included in the search if they had been identified in previous searches and were relevant to the topic. Other articles were sourced by review of the bibliographies of articles identified in the searches.

The titles and abstracts of the articles identified in the search were further reviewed for relevance to the topic. The relevant articles were then reviewed in their entirety. Articles with large limitations were excluded. The remaining articles were reviewed for themes and sorted into five categories: risk and prevalence, factors related to aging and medication understanding, format and delivery, testing and iteration, or qualitative evaluation. Twenty-nine articles were included in the review and will be discussed thematically. The articles are summarized in a literature grid in (see Table 1).

Risk Factors and Prevalence

There are many studies that look at the prevalence and risk factors leading to the inability to understand medications. Eight articles looked specifically at prevalence and risk factors for older adults. Some studies were not specific to older adults but were included in the literature review as they still provide insight into potential risk factors. Three moderators of older adults understanding their medications are health literacy, medication regimen complexity, and age (Chan et al., 2013; Chin et al., 2017; Cutilli, 2007; Morrow, Weiner, Young, & Steinley, 2005). Morrow et al. (2005) found that for older adults, age accounted for 30% of the variance in the recall of medication information and health literacy accounted for 27% of the variance. A cross-sectional survey of 412 older adults recently discharge from the hospital found that 24% were unable to recall the purpose of their new medications that they received during their hospitalization (Chan et al., 2013).

Factors Related to Aging and Understanding Medications

Cognitive Factors. There is evidence that cognitive changes that occur during aging affect older adult patients' comprehension of medication information. One study showed that information processing capacity decreases with aging and is associated with reduced recall of self-care information (Chin et al., 2017). In a large prospective cohort study, 27% of older adult subjects did not comprehend their medication instructions and comprehension decreased significantly with age (Albrecht et al., 2014). Chan et al. (2013) conducted a logistic regression of the factors related to medication comprehension on older adults, and found that for each additional medication prescribed, the likeliness of the patients' recalling the medication side effects decreased by 35%.

Thus, cognitive changes that occur with aging, such as reduced information processing ability may impact older adult patients' ability to understand and remember important information about their medications. Polypharmacy may add to the demand on cognitive resources and cause further problems with medication understanding (Albrecht et al., 2014).

Health Literacy Concerns. Educational materials are frequently written at levels that are too complex for patients with low health literacy to understand (Estrada, Hryniewicz, Higgs, Collins, & Byrd, 2000; Liu, Abdul-hussain, Mahboob, Rai, & Kostrzewski, 2014; Poplas-Susič, Klemenc-Ketis, & Kersnik, 2014). It is recommended for older adults that medication education be written at or below a sixth-grade reading level, with size 12 font or larger, and bulleted lists that follow the schema an older adult comprehends (Estrada et al., 2000). Liu et al. (2014) examine 48 patient information handouts on medications from a variety of companies and found 63% were written above the upper limit for ease of reading for the elderly and only 9% used size 12 font or larger which is recommended for older adults due to their visual acuity changes

(Estrada et al., 2000; Morrow, Weiner, Steinley, Young, & Murray, 2007; Morrow and Conner-Garcia, 2013). Another study found that 88% of the medication handouts were written above a ninth-grade reading level (Estrada et al., 2000). Qualitative studies regarding patients' perspectives of medication handouts are they are too complex and difficult to understand (Poplas-Susič et al., 2014). Anxiety was a commonly reported feeling for older adult patients receiving medication handouts due to the complexity (Knight, Thompson, Mathie, & Dickinson, 2013).

Older adults are at high risk for not being able to understand information about their medications (Albrecht et al., 2014; Chan et al., 2013; Chin et al., 2017; Estrada et al., 2000; Hayes, 1998). With low health literacy, age-related changes to processing and cognition, complex medication regimens, and educational materials that are difficult to read, the prevalence of not understanding medication information is far too high among the older adult population (Albrecht et al., 2014; Chan et al., 2013; Chin et al., 2017; Estrada et al., 2000; Hayes, 1998). Interventions to improve medication teaching should consider these risk factors and the overall prevalence of older adults not understanding current methods for teaching new medications.

Format and Delivery

Many of the articles found in the literature review focus on how to format and deliver teaching to older adults or those with low health literacy. Fourteen articles either tested, recommended, or sought feedback for the way medication information is formatted and delivered. Some articles were specific to older adults and some were generalized to the adult population. The following section will review three topics: simplified format and schema, delivery and setting, and teach back.

Simplified format and schema. Many studies recommended use of simplified format

that follows the schema older adults have for learning about medication. A meta-analysis of 33 randomized controlled trials (RCTs) on interventions to improve medication adherence for older adults found that written education materials that were simple and succinct have a stronger effect on medication adherence than other forms of education (Conn et al., 2009). A systematic review of 47 studies recommended creating educational materials that are easy to navigate using large fonts, bullet points, icons, and use of shorter words (Wali, Hudani, Wali, Mercer, & Grindrod, 2016). The systematic review along with other studies identified during the literature review indicate simplified language, large fonts, a bulleted list of no more than 5-6 points, headings, and icons increased patient comprehension and satisfaction (Aker et al., 2013; Hayes, 1998; Hayes, 2005; Jolly, Scott, & Sanford, 1995; Morrow & Conner-Garcia, 2013; Morrow et al., 2007; Pander Maat & Lentz, 2010; Poplas-Susič et al., 2014; Savaş & Evcik, 2001; Speros, 2009; Wali et al., 2016) There was only one study that did not show a significant improvement in patients' knowledge of medications with the use of simplified medication handouts. However, the researchers did find a significant improvement in family members' confidence in managing medications (Kimball et al., 2010). Overall, there is high level evidence that simple formats, bulleted lists, and large fonts improved comprehension and decrease the time spent navigating to the desired information (Morrow et al., 2007).

Seven studies recommended or tested medication information presented in a schema specifically designed to benefit the cognitive abilities of older adult patients. This schema typically follows the following order: medication name and purpose, how to take the medication, side effects, and special information (Aker et al., 2013; Hayes, 1998; Hayes, 2005; Morrow & Conner-Garcia, 2013; Morrow et al., 2005; Morrow et al., 2007; Pander Maat & Lentz, 2010). Three studies performed testing on medication handouts redesign in the older adult schema and

found that older adult patients showed significantly improved knowledge or satisfaction compared to standard medication handouts (Hayes, 1998; Morrow et al., 2005; Morrow et al., 2007; Pander Maat & Lentz, 2010).

Delivery and setting. Another recommendation from the literature is providing the education in quiet, well-lit environment focusing on small amounts of information with at least five dedicated minutes (Hayes, 2005; Morrow & Conner-Garcia, 2013; Speros, 2009). A qualitative study on older adults' experiences with medication teaching revealed the theme of patients feeling that teaching was too brief and that health care staff did not have adequate time to explain and answer questions (Modig et al., 2012). Setting aside time in a well-lit, quiet environment addresses the specific needs of the older adult due to sensory deficits and decreased processing capacity (Hayes, 2005; Morrow & Conner-Garcia, 2013; Speros, 2009).

Teach back method. Teach back is a method whereby nurses educates a patient and then has the patient describe what they learned (Morrow & Conner-Garcia, 2013; RNAO, 2012). Nurses assess learning based on the patient's explanation. Based on the response they then reinforce learning and clarify misunderstandings (Morrow & Conner-Garcia, 2013; RNAO, 2012; Speros, 2009). Teach back has been used in many clinical situations to help improve both recall of information and reduce adverse outcomes such as readmissions (Centrella-Nigro & Alexander, 2017). This technique has been recommended by several sources in the literature as an ideal way to conclude an educational session with an older adult (Morrow & Conner Garcia, 2013; RNAO, 2012; Speros, 2009). A systematic review on teach back method showed the method increased adherence to medication and self-care, improved disease-specific knowledge, increased self-efficacy, and reduced hospital readmissions (Ha Dinh, Bonner, Clark, Ramsbotham, & Hines, 2016).

Testing and Iteration

Four studies in the literature review examined the process of using some form of testing and iteration of educational materials as a method to develop these materials more effectively (Aker et al., 2013; Berthenet, Vaillancourt, & Pouliot, 2016; Koops van 't Jagt, Hoeks, Jansen, de Winter, & Reijneveld, 2016; Pander Maat & Lentz, 2010). These studies used patient feedback to develop educational materials and then tested the new materials against the standard educational materials (Aker et al., 2013; Berthenet et al., 2016; Koops van 't Jagt et al., 2016; Pander Maat & Lentz, 2010). Aker et al. (2013) and Pander Maat and Lentz (2010) found that patients experienced a significant improvement in their comprehension and satisfaction of medication information when using the new medication materials. In a systematic review of the literature on comprehensibility of health-related documents in older adults, Koops van ’t Jagt et al. (2016) found inconsistent results for most of the interventions but did find support for the use of testing and iteration of educational materials with the target audience. Berthenet et al. (2016) looked at older adults’ comprehension of pictograms for medication instructions and found that not all pictograms reached the 67% comprehension rate that was required for use. The study then recommended testing of any type of pictogram in the older adult population with modification and retesting if the comprehension rate was not met (Berthenet et al., 2016). Iteration and testing of different versions of educational materials is supported in the literature and can be used to test and validate comprehension of educational tools.

Qualitative Evaluation of Emotion

Qualitative studies provide rich data on patients’ experiences and the challenges older adults face as they attempt to navigate the complexity of medication management. In several studies, anxiety, concern, fear, and abandonment were common emotions reported by

participants reading complex medication information (Bagge, Norris, Heydon, & Tordoff, 2014; Herber, Gies, Schwappach, Thurmann, & Wilm, 2014; Meranius & Marmstål Hammar, 2016). Behavioral responses to these emotions were categorized as either information seeking or risk taking (Bagge et al., 2014; Herber et al., 2014; Meranius & Marmstål Hammar, 2016). Information seeking behaviors included participants calling their provider or pharmacist to get more information about their medications; however, many participants identified approaching healthcare staff as difficult and unwelcome (Bagge et al., 2014; Herber et al., 2014; Meranius & Marmstål Hammar, 2016). The opposite reaction to these emotions is risk taking behaviors such as discontinuing the medication without consulting the provider (Herber et al., 2014; Meranius & Marmstål Hammar, 2016).

Another commonly reported emotional response to reading complex medication information was dissatisfaction with the amount, depth, or time spent on medication teaching (Cooper & Garrett, 2014; Knight et al., 2013). Knight et al. (2013) found 74% of participants felt they received inadequate information regarding their medications while in the hospital. A commonly identified theme was that the hospital staff did not have time or did not welcome questions from patients (Knight et al., 2013; Modig et al., 2012). Some participants were unaware of the medication changes that were made (Bagge et al., 2014). Satisfaction with medication information was facilitated by trust in the provider, adequate information, and knowing how to get more information if needed (Modig et al., 2012). Barriers to satisfaction with medications were distrust of the provider and health care system, inadequate amounts of information given, and lack of availability for the participant to get more information when needed (Modig et al., 2012).

The qualitative studies reviewed indicate that there are consequences to patients being

overwhelmed with complex medication instructions. When older adults are uninformed about medications and lack the availability to seek understanding, they may have risky behavior with medication management (Herber et al., 2014; Meranius & Marmstål Hammar, 2016). Quality improvement efforts for medication teaching should harness facilitators of satisfaction to minimize feelings of anxiety, fear, and abandonment.

Clinical Practice Guideline

During the literature review, a clinical practice guideline was also sought out to guide the QI project. Clinical practice guidelines are documents used to guide practice rooted in a systematic review of the evidence (Field & Lohr, 1990). The clinical guideline that was most applicable to the clinical problem of patients not feeling informed about their medication was *Facilitating Client Centered Learning* (RNAO, 2012). The clinical practice guideline was evaluated using the AGREE II, a valid and reliable tool for the evaluation of clinical practice guidelines. (Brouwers et al., 2010a; Brouwers et al., 2010b). The guideline was found to be of high quality and rigor. The guideline echoes the findings of the literature review. First, it recommends using simplified language, without medical jargon, that is easy to navigate. Next, it recommends structuring and standardizing the process. Last, it recommends using teach back to assess for patient learning (RNAO, 2012). These recommendations will be applied to the standard process for new medication teaching in this QI project.

Critique of the Evidence

There is a wealth of literature available that can be applied to the problem of older adults feeling informed about their medications. Although there is a lack of large RCTs, there are several smaller RCTs, literature reviews, qualitative studies, expert opinions, and a meta-analysis of small RCTs. One weakness identified via the literature review is that many studies used

different measurement tools or monitored different outcomes resulting in inconsistent results. The addition of some larger RCTs that look specifically at the outcomes of knowledge, preference, and satisfaction, comparing standard versus simplified medication teaching in the older adult population would add to the strength of the evidence.

Conclusion

Evidence clearly shows that medication teaching for older adults is a wide spread problem with potentially devastating consequences (Albrecht et al., 2014; Wu et al., 2013). When patients discharge from the hospital without a clear understanding of their medication they are more likely to make medication errors leading to recurrence of illness, rehospitalization, and in some cases death (Wu et al., 2013).

There is strong evidence that older adults are at an especially high risk for not understanding education due to cognitive and processing changes of age, sensory deficits of age, and lower health literacy levels (Albrecht et al., 2014; Cutilli, 2007; Morrow and Conner-Garcia, 2013). Most medication handouts are written at literacy levels that are too difficult for the typical older adult to understand (Estrada et al., 2000; Herber et al., 2014; Lui et al., 2014). Another barrier is that educational materials are not formatted with the schema of the older adult mind (Estrada et al., 2000; Herber et al., 2014; Lui et al., 2014). Interventions suggested by the literature are providing older adults with simplified written materials, formatted to meet the schema of the older adult mind, and verifying understanding via teach back method (Conn et al., 2009; Morrow & Conner-Garcia, 2013; RNAO, 2012; Speros, 2009; Wali et al., 2016).

Although there is a lack of large RCTs to support the use of simplified format and delivery, there are enough small RCTs, clinical practice guidelines, qualitative research, and expert opinions to support the use of this intervention. Creating a standardized process for

medication education that uses the teach back method and a simplified format and delivery, are interventions that are supported by the literature and address the unique problems of the microsystem. These interventions will make up the standard process for new medication teaching on the SCU to improve older adult patients' knowledge and satisfaction.

The purpose of this chapter was to review the current literature about medication teaching for older adults and evaluate the strength of the evidence for interventions. After a review of the literature, enough evidence was found to support simplified medication handouts and use of the teach back method to increase the knowledge and satisfaction of older adult patients with new medication teaching. These two interventions will be incorporated into the new standard process on the SCU. This standard process is evidence-based and will serve as the QI project for a CNL student in the clinical microsystem of the SCU.

Chapter III: Quality Improvement Framework

Frameworks from the QI literature are used to guide improvement efforts and focus change on systems instead of individuals (Hughes, 2008). Not all QI models are appropriate for all clinical problems. The clinical problem being addressed in this QI project is that older adult patients do not feel informed about their medications. The root cause analysis showed that a lack of standardized process and evidence-based practice were the main contributors to the clinical problem. After exploring several frameworks, the DMAIC (Define, Measure, Analyze, Improve, Control) methodology was selected to guide this QI project based on its ability to create a reliable, streamlined process (Furterer, 2014).

DMAIC Methodology

DMAIC methodology has its roots in Six Sigma. In the 1980s, Motorola became increasingly interested in the improvement efforts of the Japanese automotive industry (Folaron, 2003). The company's QI department carried out a project to seek out and combine all the best QI practices available at the time (Folaron, 2003). This project, otherwise known as the Bandit Project, led to the development and creation of Six Sigma—a QI philosophy that is data-driven and focused on prevention of defects (Furterer, 2014).

The DMAIC methodology is especially helpful in analyzing and eliminating process variation (Furterer, 2014). DMAIC is an acronym for the five key phases of the method—design, measure, analyze, improve, and control. Each phase has tasks and tools to help the user succeed. Define involves identifying the problem and scope of the project as well as gaining stakeholder support (Shankar, 2009). This may include creating a project charter, a formal project plan, and process map. The next phase—measure—involves identifying metrics to measure the process and outcomes using surveys, chart reviews, or benchmarking. The third phase—analyze—

explores the gap between the current condition and ideal condition. Tools that are helpful in this stage are cause-and-effect diagrams, pareto charts, and failure mode and effect analysis.

Once defined, measured, and analyzed, the problem can be addressed using the final two phases in the DMAIC model. The improvement phase consists of designing and piloting improvement recommendations. This is done by evaluating the evidence-based practices in the literature, process mapping the ideal state, and creating an implementation plan. The final phase—control—is used to create a plan to sustain the improvement. Control charts, scorecards, and dashboards are a few ways to measure sustainment. These two phases may involve iteration if improvement is insufficient or the ideal state has not been attained (Furterer, 2014).

Application of DMAIC to the Clinical Problem

Although DMAIC methodology was originally designed for manufacturing, the principles and tools can be applied and adapted to health care (Furterer, 2014). The clinical problem—patients do not feel informed about their medications—involves the process of medication teaching. During the initial exploration of the problem, it was identified that the process for medication teaching lacked standardization. Thus, there is a vast amount of variability. The purpose of DMAIC methodology is to improve efficiency and eliminate variability from a process, making this and ideal QI framework to approach this clinical problem. The following sections will describe how each phase of the DMAIC methodology can be applied to improve the process of medication education on the SCU (see Figure 7).

Define

Defining the problem is the starting point for DMAIC methodology (Shankar, 2009). The problem—older adult patients do not feel informed about their medication—was identified after completing a microsystem assessment of the SCU. The microsystem assessment is a primary

way for CNLs to identify potential opportunities for QI (Thomas, 2014). Once the problem has been identified, it will be more clearly defined using process mapping (see Figure 8) (Institute for Healthcare Improvement [IHI], 2017a; Shankar, 2009). The process map defines the scope of the project by identifying a start and end which serve as the boundaries for the project (Shankar, 2009). For this QI project, the process starts when the provider enters a new medication order in the electronic health record (EHR) and ends when the nurse documents completion of new medication teaching in the EHR.

The next steps of the define phase are to establish a team and gain support from management. The team should consist of no more than eight members (Shankar, 2009). Most of the members should be experts on the subject but the group might also include a non-expert to bring an unbiased perspective (Shankar, 2009). Nurses, providers, pharmacists, pharmacy technicians, and a CNL would all be suitable team members for this project. Since this is a patient satisfaction issue, it may be prudent to also include patient representation or the Patient Experience Committee for the unit. The team will create a project plan and a charter, which is an agreement between the team and management that assures support for the project (Shankar, 2009).

Measure

The purpose of the measure phase is to collect baseline data to explore what aspects of the process are problematic and to establish metrics to demonstrate improvement (Shankar, 2009). According to Thomas (2014), QI must be "data-driven, process-oriented, outcome-focused activities" (p. 220). It is not enough to make a change and believe it has caused improvement. Rigorous QI efforts involve collecting data, not only to prove a problem exists, but also to verify the interventions led to improvement (Smith, 2014; Thomas, 2014). The metrics for a QI project

must be meaningful and aligned with the goals and purpose of the QI project (Smith, 2014; Thomas, 2014). Data should be displayed graphically to increase understanding of variability and data distribution (Furterer, 2014). For this QI project, data will be measured for both process and outcome metrics.

Process metrics verify the intervention and process are being performed as intended (IHI, 2017b). These metrics allow the team leading the improvement efforts to see how often the intervention is being completed as intended and relate it to the improvement in the outcome metrics. For this QI project, one process metric would be monitoring the percentage of documentation for education on new medications. This information would be obtained via chart reviews. Baseline data collection showed that new medication education was only being documented 3% of the time. After implementation, this data can be collected weekly and displayed on a run chart to monitor for improvement and trends.

Outcome metrics measure whether the intervention results in improvement of patient care, efficiency, or cost of services (IHI, 2017b). There are several outcome metrics that can be monitored to verify whether the intervention has caused improvement. Outcome metrics currently identified for the project are the unit HCAHPS results. Data from HCAHPS show low scores for patient satisfaction regarding communication on new medications (see Figures 3, 4, 5, and 6). These scores will be benchmarked against the 50^{th} percentile to set attainable goals. Since HCAHPS data is reported monthly and typically has a two-month lag time, other outcome measures will be monitored. One way to do this is to survey nurses with a pre- and post-implementation survey. Another way to monitor progress would be to verbally survey the patients throughout the project; however, this would require special permission from the institutional review board (IRB).

Analyze

The analyze phase is used to understand the barriers and causes of variability in the process (Furterer, 2014). A cause-and-effect diagram will be created to identify barriers for staff to complete medication education (see Figure 2) (IHI, 2017a). The barriers can be further explored by measuring the frequency they occur and creating a pareto chart from the data (IHI, 2017a). Pareto charts help the team identify which barriers, if addressed, have the most potential to improve metrics (IHI, 2017a). A failure mode and effect analysis will be used to explore the possible ways to fail in each step of the process map (Furterer, 2014). Severity and frequency are rated for each failure, helping the team to prioritize items with the greatest potential for harm (Furterer, 2014).

Improve

Once the analyze phase has been completed, appropriate improvement efforts need to be identified (Furterer, 2014). The team will review the literature to see what interventions are recommended to improve medication teaching for older adults (Furterer, 2014). Once the intervention has been identified, a new process map will be made to reflect the ideal condition (see Figure 9) (IHI, 2017a). This process will be piloted, and metrics monitored to verify improvement (Furterer, 2014). Iteration of this phase will occur if the new process does not produce the desired results.

The QI interventions should be based on high quality evidence from the literature. A literature review revealed a clinical practice guideline created to help nurses facilitate client-centered learning (RNAO, 2012). Clinical practice guidelines are documents used to guide practice rooted in a systematic review of the evidence (Field & Lohr, 1990). Three themes emerged from review of the literature and the clinical practice guideline that can address patient

and process variables associated with the clinical problem of older adult patients feeling informed about their medication—standardized process, simplified format and delivery, and teach back methodology (RNAO, 2012). These interventions will be combined in a new standardized process for new medication teaching.

Control

In the control phase the improvement team will establish a plan to sustain the new process (Furterer, 2014). Metrics will continue to be monitored with dashboards and control charts (Furterer, 2014). A final report will be completed including project savings, key learnings, and recommendations for future projects (Furterer, 2014; Shankar, 2009). Finally, a celebration of project completion will be held to recognize the hard work of all involved (Furterer, 2014; Shankar, 2009).

Conclusion

Patients not feeling informed about their medications is a safety risk that leads not only to adverse outcomes but also to poor patient satisfaction and decreased CMS reimbursement. HCAHPS scores and staff feedback demonstrate this is a problem on the SCU. To address this issue, a QI team should look to the literature for suggested interventions and use a QI framework to guide their intervention. DMAIC methodology is a rigorous framework that has been successfully used in health care improvement efforts (Furterer, 2014). Evidence-based interventions found in the literature are standardizing the education process, simplified delivery and format, and providing education with teach back method (RNAO, 2012). These interventions address both patient and process variables and should be implemented and monitored during a QI project to increase patient satisfaction with medication information.

Chapter IV: Clinical Protocol

A microsystem assessment of a 32-bed acuity adaptable SCU revealed the problem of older adult patients not feeling informed about their medications. The primary source of this finding was the unit's HCAHPS scores. The unit's FY17 mean scores for three questions regarding medication communication were below the 50th percentile. Currently, nurses on the SCU document completion of new medication teaching a mere 3% of the time. When patients discharge from the hospital without a good understanding of their medication, they are more likely to take medications incorrectly. This results in recurrence of illness, increase health care utilization, adverse drug events, and—in some cases—death (Chan et al., 2013; Modig et al., 2012; Nelson et al., 2006). Additionally, hospitals loose financial reimbursement with 30-day readmissions and poor HCAHPS scores (CMS, 2015). Three interventions emerged from review of the literature to improve the process of new medication teaching—process standardization, universal health literacy precautions, and teach back methodology (RNAO, 2012). This chapter describes the steps that were taken for a QI project to increase the frequency that nurses teach older adults patients about their new medications in a format that they could understand to improve patient satisfaction with medication information.

Quality Improvement Project

Project Purpose

The purpose of this project was to increase the frequency in which nurses provide new medication teaching to older adult patients in a format they could understand. The objectives to reach this overall goal were standardizing the teaching and documentation process, increasing provision of educational materials that are simple and easy to read, and increasing the use of the teach back method to verify understanding. Less than $200 in resources went into this project,

making it a low-cost project with the potential to save the hospital significant amounts of money via increased value-based reimbursement and decreased 30-day readmissions. Although this project has low-tech interventions, informatics was used to determine the most frequently prescribed medications to supply pre-printed medication handouts for the top 200 medications prescribed on the SCU. Informatics was also used to collect data from within the EHR to verify frequency of new medication education. Despite being low-cost and low-tech, challenges to this project were gaining buy-in from leadership and frontline staff as well as the lag time for HCAHPS results. Overall, this was a feasible project that increased the frequency patients received information on their new medications in a format they could understand to improve patient experience scores on medication information.

Steps for Implementation

The following sections will describe how each phase of the DMAIC methodology and tools from IHI were applied to improve the process of new medication education on the SCU (see Figure 7). The step-by-step guide is known as a clinical protocol. This clinical protocol describes how each phase of DMAIC was applied to this QI project and includes detailed steps and milestones.

Define

Define involves identifying a problem, reviewing the data, mapping the current process, engaging stakeholders, and forming a team (Furterer, 2014). The define phase of this QI project was completed June-December 2017 during clinical immersion in the SCU.

Problem identification. The problem of patients not feeling informed about their medication was identified during the microsystem assessment of the SCU. The 5Ps model is a tool to assess a clinical microsystem based on the purpose, patients, professionals, processes, and

patterns that are common within the microsystem (Batalden, Nelson, Godfrey, & Lazar, 2011). The microsystem assessment is especially helpful in identifying potential problems to address (Batalden et al., 2011). Using the 5Ps assessment tool, the process of medication teaching was found to be a daily process that was problematic on the SCU. This microsystem assessment was completed June to August 2017 as part of the immersion clinical experience.

Data Review. Once the problem of patients not feeling informed about their medications was identified, data was further explored specific to the problem. One aspect about the problem that was explored is how many people manage their own medications after discharging from the SCU (see Figure 1). The next data that was reviewed was how satisfied the patients were with communication about their medications. Data from the FY17 HCAHPS scores regarding communication about medications and knowledge about medication after discharge were below the 50th percentile benchmark (see Figures 3, 4, 5, and 6 and Tables 2, 3, 4, and 5 for scores and data collection tools). Next, data was collected on the frequency that new medication teaching was documented in the EHR by reviewing charts. Baseline data showed that teaching was documented on new medication within 24 hours of being ordered 3% of the time (see Table 6 for data collection tool). Last, direct observation of nurses in their practice, was completed. During this observation, it was observed that nurses had many activities to complete and did not often sit down with and educate patients on their new medications. Handouts were not given for new medications, however, a brief verbal teaching on the purpose of medications was typically completed, for example, "This medication is for your blood pressure." All the data collected provides insight into some of the root causes of the current problem.

Mapping the current process. Flow charting or process maps are used to look closely at the current process. The flow chart breaks a process down into a visual representation of the

sequence of steps within the process (IHI, 2017a). It is important to identify the start- and end-point, to have a shared understanding of the scope of the process (IHI, 2017a). For this QI project, the start is when a provider puts an order for a new medication in the EHR and ends when the nurse documents education. Additionally, delays or barriers can be identified in the flow chart to see where there is opportunity for improvement. A flow chart of the current new medication education process is displayed in Figure 8.

Identify stakeholders and form a team. For QI projects to move past the define phase of DMAIC, support to address this problem was obtained. The first step to accomplish this was creating a list of potential stakeholders in this process (see Table 7) (Shankar, 2009). Next, meeting with each stakeholder to discuss the problem and the potential for a QI project was essential to gaining their support. An essential stakeholder for this project was the nursing unit leadership and the IRB. At this institution, QI projects must be presented to the leadership team and the IRB to guarantee the changes do not violate any human rights or privacy laws, and that the project is aligned with the strategic goals of the organization. Once approval from the stakeholders was obtained, a team was formed to move the project forward (Shankar, 2009). For this project, the team and stakeholders included the unit CNL, a clinical pharmacist, an MSN student, university faculty, and the nurses on the SCU Patient Experience Committee.

Measure

The next phase of DMAIC is measure. Rigorous QI efforts involve collecting data, not only to prove a problem exists, but also to verify the interventions led to improvement (Smith, 2014; Thomas, 2014). It is important to make sure that metrics align with the goals of the QI project and truly are measuring what the team intends to improve (Smith, 2014; Thomas, 2014). Process metrics are measures to see if the intended intervention is being completed and how

often this is occurring (IHI, 2017b). Outcome metrics are used to see if the intervention is leading to the desired improvement (IHI, 2017b). For this project, both process and outcome metrics were measured. The following sections identify what process and outcome metrics were measured and how that data was collected.

Process metrics. Process metrics for this QI project measured adherence to the new process of medication teaching; in other words, how often nurses were teaching patients about their new medications in a format they could understand. One way this was measured was by reviewing the patients' charts to determine if new medication teaching was documented. This was collected weekly, via manual chart review. The reviewer looked at the time of a new medication order, the time the first dose of the new medication was given, and then look to the education section to see if the nurse documented teaching the patient on that medication (see Table 6 for data collection tool). Another way this was measure is self-reported frequency of education by nurses. This data was collected using a nurse survey that was administered prior to the start of the QI project and five weeks post-implementation (see Figure 10).

Outcome metrics. Outcome metrics measure whether the intervention results in improvement of patient care, efficiency, or cost of services (IHI, 2017b). For this QI project, outcome metrics were measured using the HCAHPS responses that report patient satisfaction with information regarding medication (see Tables 2, 3, 4, and 5 for data collection tools). This data has a two-month reporting lag time so preliminary data was used for this metric; however, the CNL on the unit will continue to monitor this metric. Other secondary outcome metrics that could be looked at are 30-day readmission rates and nurse satisfaction with the medication teaching process; however, for the purposes of this process HCAHPS data was the only outcome metric monitored.

Data abstraction tool. Data for both process and outcomes metrics were collected and stored in a data abstraction tool that was created in an excel document. This tool housed all the essential data collected for this QI project. The data was processed using excel into visual displays such as run charts, pie graphs, and bar charts. An overall table depicting the goals of the QI project was also created in the data abstraction tool to easily view whether goals were met (see Table 8).

Analyze

The analyze phase of DMAIC focused on factors of the process that led to unsatisfactory results (Furterer, 2014). The barriers and causes of variability were explored using several tools from the IHI *Quality Improvement Essentials Toolkit,* including flow charts, cause-and-effect diagrams, and pareto charts (IHI, 2017a). A flow chart of the current process helped the QI team to see each step, barriers to each step, and variability in the process (see Figure 8) (IHI, 2017a). A Cause-and-effect diagram was completed by talking with staff about the barriers during medication education and separating those factors into five categories: manpower, environment, measurement, materials/machines, and methods (see Figure 2). Last, a pareto chart was created using the nurse survey to identify the most common barriers from those identified in the flow chart and cause-and-effect diagram (see question 8 in Figure 10). Analyzing the problems in the process helped the QI team address the microsystem specific issues by eliminating barriers and creating an ideal process (Furterer, 2014). The analyze phase was completed March to April 2018.

Improve

The next phase in the DMAIC methodology is improve which involves looking to the literature for evidence-based interventions, adapting those interventions to the microsystem, and

piloting the process within the microsystem. This step will be reviewed in greater depth in the following sections and was completed April to July 2018.

Literature review. A literature review is an essential tool for the QI team to identify interventions that are evidence-based to solve their microsystem specific problem. A literature review using a PICOT question was used to guide the search and identify appropriate articles. A PICOT search involves identifying the population, intervention, comparison, and desired outcome, and then searching for the terms in healthcare databases (Melnyk & Fineout-Overholt, 2015). The PICOT question used in this search was: In older adults does simplified medication teaching improve satisfaction and understanding compared to the standard medication teaching . Key words from this PICOT question including synonyms were used to search in CINAHL, PubMed, and Cochrane Library. Results from the search were analyzed for relevance, rigor, and inclusion criteria. Articles meeting all these requirements were organized into a literature grid (see Table 1).

Once the literature review was completed, the evidence was applied and adapted to fit the microsystem specific needs. To do this, the QI team looked at the barriers and variability identified in the analyze phase to see if any of the evidence-based interventions identified during the literature review applied to those barriers. The QI team identified three interventions that would have the biggest impact on the microsystem specific needs and used these interventions to formulate a new ideal process for new medication education.

Create and pilot the new process. Once the evidence from the literature was applied to the microsystem specific problem, a new ideal process was created. To verify the new process would work a flow chart of the new ideal process was created (see Figure 9). After the new process was created, the QI team sent out education on the new process to the staff via email and

a project poster. The QI team also made sure the staff had all the tools and resources necessary to carry out the new process. This included ordering of new supplies (2 filing carts, 400 hanging file folders, 400 sheet protectors, 32 job ticket holders, and 32 command strip wall hangers) as well as, creating a job aid to for adding a link to the EHR toolbar for the pharmacy medication handouts.

The next step was piloting the new process. During this step, the QI team continued to collect data on the established metrics using data collection tools and established data collection methods. The QI team stored this data in a data abstraction tool in excel which was used to turn the data into graphic displays. The graphic displays of data were posted weekly for staff to see progress toward goals on the project poster. A place for staff to give the QI team feedback was created on the poster board so that iteration could occur if barriers were identified. Iteration in the improvement phase is common and results in a process that fits the workflow of the people performing the process. During the pilot, no barriers or process changes were identified but the CNL will continue to monitor the process and will use the PDSA (plan-do-study-act) cycle as recommended by IHI if iteration must occur in the future (2017a). Once the process has led to the desired improvement, the QI team will move on to the next phase in DMAIC. Currently the project remains in the improvement phase as it has not reached the outcome metric goals. Due to this the CNL student reported off to the QI team with recommendations to continue the project in the improvement phase, and recommendations for how to proceed to the control phase.

Control

The final phase in DMAIC—control—involves creation of a sustainment plan, presentation of success and sustainment plan to stakeholders, and a celebration of completion. The CNL student reported off to the QI team who will create a plan to ensure that the process

and changes that have occurred will be sustainable. The CNL student recommended iteration of the process and improvement phase until the goals are met. Once goals are met, the CNL student recommended to the QI team to perform continued, but less frequent, audits and reporting of metrics. In addition to continued monitoring, the CNL student recommended that the QI team establish a maintenance goal for the frequency of documentation and patient satisfaction. This allows those involved in the sustainment to identify the threshold of sustainment. If audits drop below the threshold of sustainment for three audits in a row, iteration or re-implementation of the project should occur. This phase also involves a report to the stakeholders that includes the sustainment plan, key learnings, project savings, and recommendations for future projects. The CNL student performed this by reporting out to the QI team, but the QI team should also report out to the stakeholders once they reach the control phase. Finally, the CNL student recommended the QI team put on a celebration for all involved in the changes and success that occurred.

Conclusion

A clinical protocol is a helpful tool to determine the steps and timeline of a QI project. This chapter describes how the DMAIC methodology was used in each step of the QI project and the tools that were used. Having a project plan is essential to successful implementation and sustainability of improvement (Furterer, 2014). This protocol was carried out with the goal of a completion date of July 9th, 2018.

Chapter V: Clinical Evaluation

Self-evaluation is a standard practice in QI with the purpose of increasing knowledge for further improvement, future projects, and to share with others the learnings gained from the improvement experience (Stevens, 2014; Thomas, 2014). No QI project comes without challenges, successes, and changes along the way to improvement (Wilkinson, 2014). The purpose of this chapter is to evaluate this project and to look at what was learned during the QI process so that further understanding of improvement science in the setting of this microsystem can be gained and shared with others to use toward future improvement efforts on the SCU.

Implementation Process and Modifications

For this QI project, the DMAIC method was used to guide the improvement process. The implementation of the project followed along the planned course with some minor changes to the methods and some major changes to the timeline. Planning for the QI project was accomplished in the define, measure, and analyze phases of the DMAIC method. Any purchasing, changes of the microsystem, or implementation of interventions were held off until approvals from the stakeholders and IRBs were obtained. The following section will review the improve phase which involved the implementation of the of the QI project pilot.

For this specific organization, a review and approval/determination must be obtained from the IRB prior to sending out any surveys to the nurses. Once IRB approval was obtained, the remaining baseline data was collected via a survey sent out to the nurses of the SCU. This survey addressed the methods used and how often the nurses educated patients on new medications as well as their perceived barriers to the teaching process (see Figure 10). This baseline data was essential to collect in order to compare to a post-implementation survey.

Once IRB approval was obtained, the changes and new process, which were identified

during the first three phases of DMAIC, had to be communicated to the SCU nurses. After discussion with the unit's CNL, it was decided that communication about the new process would occur via two modes: email and a project poster. Both modes included visual graphics showing why a QI project was necessary, a process map of the new education process (see Figure 9), a job aide for adding a link to the EHR toolbar, and details about the timeline of the project. Communication of the changes was a key step to successful implementation and for gaining buy-in from the nurses that perform the task of new medication education.

After the QI team gained IRB approval and the project was communicated to the nurses, the supplies were purchased. Due to the extended amount of time to get IRB approval, the supplies were ordered only a week prior to the go-live date of the QI project. The supply cost for this project was under $200 and included: two rolling file carts, 400 hanging file folders, 400 sheet protectors, 32 job ticket holders, and 32 small adhesive wall hooks. Permission to purchase these supplies using the SCU's operational budget was obtained during the approval of the project with the SCU leadership. The purchase of these supplies was completed through the Hospital Unit Coordinator in charge of purchasing for the SCU. All supplies were purchased from an office supply store through which the organization receives a discount. The supplies were received with three days left until the go-live date for the QI project.

Due to scheduling conflicts, the supplies were setup the night prior to go-live. This involved printing out ten copies of each medication handout for the top 200 medications prescribed on the SCU. The two rolling file carts were labeled and filled with the handouts for the 200 medications. One of the rolling files carts was placed in each medication room. This location was chosen as it is the location where nurses pick up new medications and it would streamline the nurses' workflow. The job ticket holders—clear, washable, and re-useable

folders—were hung up in each patient room to provide a location for nurses to store the medication handouts to review with patients. The job ticket holders were able to be taken off the hooks and handled by patients and families. Everything about the physical supplies that were used were prepared to fit into the workflow of the bedside nurse.

Once all the supplies were in place and the changes were communicated to the nurses, go-live of the project took place. The changes consisted of printed out medication handouts being supplied in the medication room, a standardized location for nurses to store the medication handouts in the patients' rooms, simplified written medication handouts, verification of learning through verbal teach back, and a standardized method for documentation.

After the new process was implemented, a chart review was conducted on 20-30 charts of patients who received new medications each week to measure the process metric. These results were sent out on a weekly basis to the SCU nurses to update them on the progress towards the project goals. Patient satisfaction data was obtained via preliminary HCAHPS results for the month of June, which consisted of the first four weeks of the project. A dedicated space for nurses to provide feedback was placed on the project poster. Feedback was also solicited in the weekly emails seeking nurses feedback on the new process and barriers to completing new medication teaching. A post-implementation nurse survey was sent out after the pilot to gather self-reported frequency and method of new medication teaching.

After a 6-week pilot of the project, the QI team evaluated the data and created a plan for the future of the project. Since not all the project goals, including frequency of education and documentation, had been met yet, the QI team reported out to the Patient Experience Committee and SCU CNL with recommendations for future PDSA cycles, improvement methods, and a potential sustainment plan once the goal is reached. It was also recommended that once the SCU

reaches the goal, audits should continue on a monthly basis for one year, revisiting the project if there are three consistent months where the goal is not met.

Evaluation of Outcomes

There were a total of seven metrics being monitored to evaluate this QI project (see Table 8 and Figure 12). Five of the seven metrics improved with three of those metrics exceeding the goal. Two metrics did not show any improvement and actually scored lower post-implementation. The process and outcome metrics will be discussed individually in the following section.

Process Metrics

Process metrics measure how often the planned intervention is being completed. The primary process metric being monitored in this project was the percentage that medication teaching was documented for new medication orders (see Figure 13). This metric was monitored via weekly chart audits. The metric did not meet the goal of 60% compliance; however, it did show an improvement from an average of 3% pre-implementation to an average of 24% compliance post-implementation. It is possible that 60% may have been too high of a goal for a 6-week pilot. The QI team also learned that this may not be an accurate representation of all the teaching being completed, as the primary barrier identified in the post-implementation survey was forgetting to document that teaching was completed. Over all the metric improved and could continue to improve if the SCU decided to continue to monitor it and address the barriers to documentation.

The next process metric monitored was the nurses' self-reported frequency of giving patients written handout education on new medications. This metric was measured using a comparison of scores for question 2 on the pre- and post-implementation nurse survey (see

Figure 10 for nurse survey). The goal for this metric was a 20% increase in the percentage of nurses self-reporting use of written handouts 75-100% of the time for new medications. This metric goal was met (see Figure 14). A greater improvement can be seen when comparing the pre- and post-implementation results for nurses reporting greater than 50% compliance using medication handouts (17% pre-implementation; 64% post-implementation) (see Figure 15). Overall, there was an increase in the use of handouts during new medication teaching when looking at the self-reported frequency of nursing staff.

The last process metric was the use of 1-page simplified handouts created by the organization's pharmacy. This metric was measured using question 5 from the pre- and post-implementation nurse survey (see Figure 10 for survey). This metric did not meet the goal and use of the 1-page simplified handouts actually declined post-implementation from 47% to 43% (see Figure 16). Despite the decline in use, the 1-page pharmacy handouts continued to be one of the most frequently used handouts. One explanation for the decline could be that there are only 1-page pharmacy handouts for 156 medications. Further improvement efforts could focus on getting pharmacy to produce more handouts for other popular medications and reeducating nursing staff about their use. It should be noted that the percent of nurses that reported using any medication handout (EHR, LexiComp, or 1-page pharmacy handout) increased from 89% to 93%, indicating an overall increased in handout use.

Outcome Metrics

The HCAHPS scores for the four questions related to medication comunication were used as the outcome metrics for this QI project. HCAHPS are a patient experience score and are reported on a monthly basis. Only one month of data was able to be obtained post-implementation. This data is considered preliminary data as many of the responses for HCAHPS

take more than a month to be submitted. The preliminary data for the month of June 2018 was used to compare to the baseline data. The baseline measures for these four metrics were calculated using the mean score from July 2016 to November 2017. The goals for each metric use the HCAHPS 50th percentile benchmark for that domain. HCAHPS measures the scores based on the top-box only, meaning that the choice of "always" or "Strongly agree" had to be selected by the patient to count towards the score. Two out of four metrics exceeded the goal of the 50th percentile benchmark. The following section will address each of the four outcome metrics.

The first outcome metric is the HCAHPS response score to the medication communication domain. This is a combination of the scores for the questions "Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?" and "Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?" (CMS, 2017, p. 3). This metric met the goal of the 50th percentile benchmark with improvement form the baseline data mean of 59.96 to 65.6 (see Figure 3 and 12). The second outcome metric, for nurses explaining the purpose of new medications actually declined when comparing the June data to the baseline mean (see Figure 4 and 12). Next, the HCAHPS score for "Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?" increased from a baseline of 46.64 to 62.5 in June 2018 (CMS, 2017, p. 3). This not only exceeded the 50th percentile benchmark of 49.5 but also exceeded the 90th percentile benchmark (see Table 4 and Figure 5). Lastly, the outcome metric for question that measures patients' understanding of medications after they are discharged improved from 55.35 to 60 and came very close to meeting the goal of 60.6 (see Table 5 and Figure 6). While most of these metrics show great improvement, the QI team would

ideally have three months of data post-implementation to monitor trends.

Major Challenges and Successes

Challenges. Several challenges were encountered during this project including: difficulty with the timeline, performing the DMAIC process out of order, and difficulty establishing a team. First, the timeline of this project was delayed by the challenge of creating an implementation plan. The QI team learned that finding the root cause of the problem and figuring out appropriate interventions for the problem is time consuming and labor intensive. Making it through the IRB process also caused delays to implementation. The QI team initially planned on a 3-month pilot of the project but had to change the pilot to 6-weeks instead due to the timeline changes. This taught the QI team that timelines do not always go as planned and the QI team must learn to adapt to changes (Wilkinson, 2014).

The next challenge was working through the DMAIC process. One of the main things the MSN student learned from this QI project is that the phases of DMAIC are not always completed in order. For example, to gain stakeholder support, some stakeholders do not just want a problem brought to them but also want a detailed plan to address the problem. Typically, in DMAIC, stakeholder support is gained prior to analyzing the process and identification of potential solutions. For this project, stakeholder support through IRB approval was gained after the define, measure, and analyze phases were completed. A submission of the findings along with an implementation plan was required to be submitted to the IRB for the organization. The QI team learned that flexibility and adaption of improvement science had to occur to fit into the expectations of the organization—the main customer of the QI team (Thomas, 2014).

The last challenge was difficulty forming a team and spreading the workload. There were many committees and improvement teams already established on the SCU when this QI project

was initiated. Most of these committees had current projects and did not have interest in taking on a new project. Since the main outcome metric for this QI project was a patient experience score the Patient Experience Committee was identified as the most appropriate stakeholder to be on the QI team. The Patient Experience Committee agreed to be on the QI team, but members of the team stated they were focusing their efforts on their current project. Due to this they were not able to contribute to much of the physical processes involved in the project; but they did provide valuable feedback and helped with planning. This was challenging for the MSN student as there was a lot of work in planning, setting up, and auditing the project. The MSN student learned that having a fully committed and involved team would have helped speed up the project and make the workload of individual team members more manageable (Thomas, 2014).

Successes. Overall, there were many successes during this QI project. The first success was the assessment of the microsystem to identify a problem that was worth solving to the stakeholders and the bedside nurses. This involved the assessment of the microsystem, evaluation of the SCU's culture and readiness to change, and a deeper analysis of the specific problem. Finding an appropriate problem for a QI project was essential to successful implementation. This success taught the QI team the importance of going through the process of problem identification to make sure the problem truly exists and is important to the organization (Thomas, 2014).

The next big success was finding solutions to the clinical problem that fit into the workflow of the bedside nurse. To do this, the QI team created a process flow map of the current process including barriers (see Figure 8). Interventions of the QI project focused on the identified barriers. The new ideal process was created with special consideration to the workflow of the nurse and addressed the barriers identified in the initial process flow map. The new ideal process

was presented to the Patient Experience Committee and adjusted with their input and expertise as bedside nurses. This was essential to making sure the bedside nurses would be willing to participate in the new process. The QI team learned that making something easier to do and seeking input from the stakeholders performing the tasks would decrease the workload of those involved (Langley et al., 2009).

The last big success of the QI project was the commitment to the process of QI. The QI team presented the project, go-live date, and what the SCU could expect from the QI team for updates during implementation. This expectation was upheld by the actions of the QI team. The QI team updated the project poster weekly and sent out weekly update emails to keep the nurses informed and engaged in the project. In order for the QI team to hold nurses to the expectation of the project, the QI team also had to show commitment to their responsibilities. The QI team learned that QI projects take a high level of commitment, frequent intervention, and set expectations for successful implementation of a QI project (Thomas, 2014).

Project Strengths and Weaknesses

The strengths and weaknesses identified in this project contributed to the success and the ability of the QI team to overcome the challenges of the QI project. The first strength identified that contributed to the success of the project is the commitment of the QI team to using improvement science. The DMAIC method was the main tool the QI team chose to carry out the QI project. Using this tool helped guide the team through the assessment and discovery of the clinical problem, root cause analysis and identification of potential solutions, as well as the successful implementation of the project. The next strength was the QI team's flexibility and willingness to adapt to changes. This allowed the QI team to push through the timeline delays and adapt the DMAIC process to the expectations of the organization.

The main weakness identified in this project was the lack of team commitment. This put most of the workload on the MSN student to plan and carry out the project. The second weakness was the scope of influence the QI team had. The QI team only had the ability to modify the workflow of the nurses on the SCU. In the future, more involvement from the providers and pharmacists would be needed to approach the problem from a multidisciplinary team and drive the outcomes of the project. Another weakness was the lack of outcome metric data available. Ideally, this project would have been piloted for three months and had three months to compare to the baseline data. With only one data point for the outcome metrics, post-implementation trends were not able to be seen. Overall, the QI team was able to learn from the strengths and weaknesses for future improvement efforts.

Sustainability

Due to the simplicity and low cost of the intervention, this project can be easily sustained. The current interventions of standard teaching process, provision of educational materials that are simple and easy to read, and the use of the teach back method have shown improvement in outcomes and can all be easily maintained. However, the goals of the project have not been met with the current interventions alone. The QI team recommends the SCU continue efforts to improve the process of new medication teaching. Based on the top barriers identified by the post-implementation nurse survey, future interventions could include: creating a way for nurses to remember to document, creating a system to help nurses identify which medications are new to the patient, addressing how to teach patients who are confused, and addressing factors that make nurses too busy to perform education (see Figure 11). Other recommendations based on staff feedback in the nurse survey included: having pharmacy increase the amount of simplified 1-page handouts to include all of the top 200 medications prescribed on the SCU, having the

pharmacist or provider help the nurse identify new medication orders, and focusing on medications key to the patient's treatment, such as, antibiotics, steroids, or cardiac medications. These suggestions for future improvement and sustainment were presented to the Patient Experience Committee and the SCU CNL at the conclusion of the QI project pilot.

Implications for Practice

Although improvement science is not generalizable like research, this QI project does have implications for practice with in the microsystem of the SCU and can be related to general trends in healthcare (Stevens, 2014). Implications for practice can be identified by looking at what was learned from the QI project. One main learning from this QI project is that there are many barriers to educating the older adult patient on the SCU. Barriers were identified during the initial problem analysis as well as the post-implementation survey. Some of the main barriers identified were not having appropriate educational materials, difficulty accessing educational materials, patients who were too confused to learn, and busy shifts that kept nurses from being able to sit down and teach their patients. Some of the barriers identified were addressed during the QI project, resulting in some improvement in the frequency that nurses educated their patients. Not all barriers were addressed, and those would serve as good areas to focus on if the SCU continues the QI project. Another implication for practice on the SCU is the need to involve providers and pharmacists in the QI project to promote a multidisciplinary approach of addressing the problem.

This QI project is relevant to major topics in health care today. The literature review in this QI project alone shows that patients, especially older adult patients, have difficulty understanding how nurses teach them about their medications during hospitalization and difficulty managing their medications once discharged (Chan et al., 2013; Chin et al., 2017;

Cutilli, 2007; Morrow et al., 2005). The literature review shows this problem is widespread and can lead to many negative health effects (Chan et al., 2013; Modig et al., 2012; Nelson et al., 2006; Wu et al., 2013). To combat this widespread problem a major focus of Healthy People 2020 is improving the way health care professionals communicate with and teach health care consumers (Department of Health and Human Services, 2018). This QI project, tackles the problem of communicating and teaching older adult health care consumers on a SCU, making it highly relevant to current health care trends. The project itself shows promising improvement using interventions from the literature that are customized to meet the unique needs of the microsystem.

MSN Essentials

Utilizing skills from the MSN essentials was vital to the success of this project. The essentials that contributed most to the success of the project were organizational and systems leadership, QI and safety, translating and integrating scholarship into practice, and clinical prevention and population health for improving health (American Association of Colleges of Nursing [AACN], 2011). During this QI project, the MSN student used organizational and systems leadership skills to form the QI team and lead the project. It took a knowledge of the organization and microsystem to design and implement a process change that fit the needs of the SCU (AACN, 2011). Next, the MSN student used knowledge of QI and safety to identify the clinical problem, implement evidence-based solutions, analyze data, and present data/outcomes in a meaningful way (AACN, 2011). The literature review, identification of appropriate evidence-based interventions, and application of the evidence to practice on the SCU demonstrated the MSN student's ability to translate and integrate scholarship into practice (AACN, 2011). Last, the MSN student helped lead the QI team in looking at how the medication

teaching process could be improved with specific consideration of the older adult population, demonstrating use of the essential of clinical prevention and population health for improving health (AACN, 2011). Although not all QI teams are led by an MSN prepared nurse or CNL, the skill set brought by this specialty is highly beneficial to the QI team (Thomas, 2014).

Conclusion

This chapter review the implementation and outcomes of a QI project to increase the frequency that nurses teach older adult patients about their new medications in a way they can understand. The project implemented a standardized process for new medication education, the use of simplified 1-page handouts, and verification of understanding using the teach back method. While the outcome metrics are still preliminary, the results of this project show an increase in frequency that nurses are using handouts to teach patients, improved patient satisfaction with explanations about medication side effects, and improved patient understanding of medications after the older adult patient has discharged from the hospital (see Figure 12). While some goals were attained, not all metrics met the set goal. Continued efforts to improve new medication teaching for older adult patients on the SCU should continue. When older adult patients do not understand their medications when they leave the hospital the results can be devastating (Chan et al., 2013; Modig et al., 2012; Nelson et al., 2006; Wu et al., 2013). With continued work to increase the frequency older adult patients receive medication teaching in a way they can understand, the SCU can improve the population health of older adults and their ability to self-manage their medications at home.

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Table 1
Literature grid of articles for increasing older adults' knowledge of medications.

Author(s) /Year	*Purpose/Aims*	*Design/ Sample*	*Data Collection*	*Major Findings*	*Appraisal*
Registered Nurses Association of Ontario, 2012	Provide evidence-based guide for nurses to facilitate client-centered learning.	CPG based in a systematic review of the evidence.	Literature review	Provide safe, shame-free environment; Assess learning needs prior to education; Create structure and intentional learning; Use plain language and avoid illustrations with older adults; Assess client learning through teach back method.	This CPG clearly describes recommendations and concrete ways to implement the recommendations. A description of the literature review process could strengthen this CPG.
Wali, Hudani, Wali, Mercer, & Grindrod, 2016	Provide a review of the literature on evidence-based interventions to improve medication knowledge for patients with low health literacy.	Systematic Review of 47 articles. All articles focused on samples of patients with low health literacy.	Systematic Review	The top four preferences of patients with low health literacy are aids that reinforce written information, personalized information, written information that is formatted for easy navigation, and easily accessible information (e.g. wallet sized medication list).	Limitations identified by this review were inconsistent methods of measurement and outcomes which made it difficult to compare studies. The authors also noted that many studies were at high risk for bias.
Koops van 't Jagt, Hoeks, Jansen, de Winter, & Reijneveld, 2016	Provide a review of the effectiveness of interventions aimed at improving the comprehensibility of health education materials for older adults.	Systematic Review of 38 articles with older adults as the study sample or a comparison of interventions comparing samples of different age groups	Systematic Review	There are inconsistent findings for almost all interventions aimed at increasing the comprehensibility of health documents for older adults. Narrative format and multiple revisions had weak but positive impact on comprehension.	Inconsistency in interventions and measurements techniques made it difficult to compare studies. The systematic review was limited due to the sample population of older adults and only looking at studies performed after 2005.

Cutilli, 2007	Provide a review of the research available on health literacy and the geriatric population.	Integrative Review of 20 articles that looked at health literacy in a sample of older adults.	Integrative Review	Age has an inverse relationship to health literacy even when other factors are controlled for; Medication adherence improves for those with low health literacy if the information is provided in lower literacy levels; Most health information in the US is provided at higher literacy levels and does not contain culturally sensitive information.	This review is limited by the inconsistent measures used in the different studies reviewed. There were some inconclusive results about factors associated with poor health literacy in the older adult population. Future recommendations for research should focus on effectiveness of interventions, and the impact health care outcomes and costs.
Wu, Holmes, Dewalt, Macabasco-O'Connell, Bibbins-Domingo, Ruo, & ... Pignone, 2013	Examine the correlation between health literacy and two outcomes— all-cause hospitalization and death and hospitalization for heart failure—in patients with heart failure.	Prospective cohort study of 595 patients with symptomatic heart failure that participated in a RCT for self-care.	Blinded interviews and chart audit 12 months after participation in the RCT; descriptive statistics; Chi-squared and t-tests; binomial regression.	When adjusting the regression model for demographics and clinical factors patients with low health literacy have 1.31 greater odds of all-cause hospitalization or death and 1.44 greater odds of a heart failure related hospitalization.	This study looks at health literacy and adverse outcomes; however, it does not account for age. This study may not be generalizable to the older adult population and is specific for patients with heart failure.
Chan, Wong, So, Kung, & Wong, 2013	Discover how much knowledge older adults with chronic disease have about their medication and factors affecting the knowledge.	Cross-sectional survey of 412 older adults (≥60 years) with chronic disease or their caregiver.	Trained interviewers completed a semi-structured interview; descriptive statistics; logistic regression.	70-72% reported getting information from health care team about the purpose and instruction for taking a new medication; 73% report they did not receive information on side effects. 76.2% were able to correctly identify the purpose of their medication.	This study was carried out in Hong Kong and may not be generalizable due to cultural differences. The study does suggest that information given to elderly be of larger print and avoid medical jargon.
Chin, Madison, Xuefei, Graumlich, Conner-Garcia, Murray, & ... Morrow, 2017	Explore the correlation of health literacy and comprehension of health information in the older adult population	Correlation study of 145 older adult patients	Data was collected by administering tests to the participants to determine processing capacity, general knowledge, health literacy and health	Health literacy was a predictor of recall when controlling for age, processing capacity, and knowledge. Analysis shows that general knowledge helps mediate for lower processing capacity on tests of recall.	This study suggests designing education that has low demand on processing capacity as it declines with age. Health education materials should correlate health concepts with existing knowledge.

			knowledge. The subjects were given health passages and then tested on recall of those passages.		
Herber, Gies, Schwappach, Thurmann, & Wilm, 2014	Examine the emotional response of patients after reading a medication leaflet.	Qualitative Study based on six focus groups consisting of 35 people.	Focus groups with guided discussion regarding the patient information leaflet of their new medication. Discussions were transcribed and analyzed for themes.	One theme is anxiety and fear when reading the long list of side effects in the patient information leaflet. Subjects report they would prefer the leaflet to only report common or important side effects. The two most common behavior reactions after reading the leaflets were discontinuing the medication or calling the prescriber for reassurance.	This study was carried out in Germany and may not be generalizable due to cultural differences. Small sample size and a focus group design are limitations to this study. Additionally, this study is not specific to the older adult population.
Albrecht, Gruber-baldini, Hirshon, Brown, Goldberg, Rosenberg,… Furuno, 2014	Assess the amount of comprehension and compliance with discharge instructions among older adults and identify associated factors.	Prospective cohort study of 450 community dwelling older adults (≥65 years) who have been admitted to a medical or surgical unit.	Baseline measures and demographics were collect within 72 hours of admission. Five days post discharge comprehension and compliance were assessed via follow-up phone call with a trained interviewer.	27% of subjects had non-comprehension of medication instructions, increased age was significantly associated with non-comprehension of medication (OR 1.07). One or more ADL disability and self-reported depression were significantly associated with non-compliance of medication.	This study has a large sample size and is specific to the older adult population. It shows there is a high prevalence of non-comprehension of medications at discharge.
Estrada, Hryniewicz, Higgs, Collins, Byrd, Estrada, & ... Byrd, 2000	Determine reading level that education material on anticoagulants given to patients is written	Study of 50 brochures of anticoagulant medication	Readability of the written material was measured using SMOG, which is and easy and widely used and accepted measure of readability and the Flesch-Kincaid Grade Level formula.	The mean SMOG readability level was 10.7 for anticoagulant medication brochures. 88% of brochures were written at 9th grade reading level or higher. None of the brochures read lower than a 6th grade reading level when measured with SMOG and only 10% were at a 6th grade level or lower when evaluated using the Flesch-Kincaid.	No limitations to this study were identified. Many of the brochures were from highly esteemed sources such as the American Heart Association, Mosby, and Mayo Clinic which are commonly used patient education materials.

Speros, 2009	Review of the literature on health literacy in the older adult population with suggestions for addressing needs unique to the older adult.	Literature Review	Literature review, no study conducted.	Use principles of geragogy during design and delivery of health education for older adults. This will address the needs of the older adult and promote learning.	There was no description of the process of the literature review or critique of the quality of the studies used to inform the suggestions made by the author.
Morrow & Conner-Garcia, 2013	Review of the literature that focuses on how to present educational materials to older adult patients.	Literature Review	Literature review, no study conducted.	Use active and concrete language with clear meaning to decrease processing demands since processing capacity is reduced in older adults. Follow a schema easily understood by older adults. For medication, name, and purpose, how to take the medication, and then side effects is the preferred order for the information. Use graphics with caution as it may increase processing demands. Verify understanding using teach back method.	There was no description of the process of the literature review or critique of the quality of the studies used to inform the suggestions made by the author.
Berthenet, Vaillancourt, Pouliot, & Vaillancourt, 2016	Validation of pictograms for medication instructions among the older adult population.	Post-test design, 135 patients that were 65 years or older.	Descriptive statistics; one-on-one interview;	Only 50 pictograms achieved over 67% comprehension in the older adult population. Although other studies suggest using pictograms for patients with low health literacy, these are not always understood by older adults and should be validated by with this population.	Small sample size and pictograms were not presented in the context of medication schedule or instruction which could limit the comprehension of the pictograms without the context.
Conn, Hafdahl, Cooper, Ruppar, Mehr, & Russell, 2009	Investigate interventions to improve medication adherence among older adults.	Meta-analysis of 33 RCTs on medication adherence in the older adult population.	Meta-analysis/ literature review	Education was not found to be a strong moderator of medication adherence; however, written instructions are more effective than verbal instruction for improving medication adherence, especially simple and succinct written instructions.	A limitation for this meta-analysis was a limited number of studies available.
Liu, Abdul-hussain,	To analyze patient information	Study of 48 patient	Descriptive statistics; paired	Content: only 15% provided age specific	While this study evaluated the

Mahboob, Rai, & Kostrzewski, 2014	leaflets regarding heart and diabetes medication, to see if the content, layout, and readability were appropriate for the older adult population in the United Kingdom.	information leaflets for medication.	T-test; Data collection using tools to analyze content, readability, and layout.	information, 31% contained warning for elderly (age not specified), 2% addressed pharmacokinetics in elderly, 67% addressed dose instructions for elderly. Layout: Only 9% presented information in size 12-font or larger, 42% followed layout guide of only 5-6 bullet points per lists. Readability: Median readability score was 12.4 with a range of 9.4-15.6 using the Gunning Fogs Index. 63% scored over a 12 which is considered too difficult for an older adult to read.	appropriateness of patient information leaflets for older adults, the study design did not actually test the leaflets with older adults.
Pander Maat & Lentz, 2010	To determine the usability of patient information leaflet prior to and after redesign utilizing evidence-based document design principles.	Pre- and post- test design on 3 patient information leaflets with 154 people for the pre-test and 164 for the post-test.	ANOVA using literacy as a covariate was used to analyze data.	All three redesigned leaflets had significant improvement ($p \leq .05$) for localization success, localization time, comprehension, and user rating for usability.	This study did not focus on older adults. The mean age of the participants was 51 years. Authors do address age, stating that it had a negative correlation with localization success and time. Literacy was the greatest predictor and was used as a covariate during data analysis.
Poplas-Susič, Klemenc-Ketis, & Kersnik, 2014	Examine the usefulness of patient information leaflets for medications in order to suggest modifications for improvement.	Qualitative study, four focus groups with a total of 20 individuals.	Focus group interviews were audio recorded, transcribed and themes were identified.	Themes that emerged from the study were that patients were more likely to read the leaflet if they did not understand the explanation given to them by the doctor, the majority of participants felt the leaflet was difficult to understand and do not offer useful information.	This was a study done in Slovenia with a very small sample size which limits the generalizability of the study. It does, however, add to the literature about patients experience with seeking information about their medications. This study was not specific to the older adult population.
Hayes, 1998	The purpose of this study is to	RCT—post-test only, with 60	Telephone follow-up 48-72	Patients who receive the geragogy-based	This is a RCT that is specific to older

	compare the medication knowledge of older adults receiving standard medication discharge instructions compared to discharge instructions designed with the geragogy framework.	patients that were randomized into control and intervention group.	hours post-discharge from the emergency department, using the Knowledge of Medication Subtest which is valid and reliable.	education had significantly better scores for medication knowledge (p=.016) especially in identification of side-effects. Medication regimen complexity was associated with poor knowledge.	adults and medication education. The small sample size limits it.
Kimball, Buck, Goldstein, Largaespada, Logan, Stebbins, . . . Kalman-Yearout, 2010	To compare three methods of teaching discharge medications (geragogy format with scheduled time for education, geragogy format only, standard format only).	Pre-test and post-test experimental design, with 66 patients of family members responsible for medication administration. These subjects were randomized into the three study groups.	Data was collected using a Medication Knowledge tests which was designed specifically for this study, the authors did not address reliability or validity of this measurement tool. Confidence in administering the medication and satisfaction with teaching was also measured using a visual analog scale.	No significant difference between the three groups was found on medication knowledge. Family members that participated in the study did have significantly higher confidence level on medication administration after education in all three formats.	Limitations to this study are a small sample size, a non-validated measure for medication knowledge, and a high number of subjects with brain injury.
Morrow, Weiner, Steinley, Young, & Murray, 2007	Evaluate whether patients preferred patient-centered medication instructions compared to standard medication instructions.	RCT of 236 community dwelling older adults with congestive heart failure.	Preference and medication goal was measured in both the intervention and control groups.	Overall, older adult patients preferred the patient-centered instructions. Those with lower health literacy and lower cognitive abilities were more likely to prefer the patient-centered instructions.	The study used geragogy principles to create the patient-centered mediation instructions. One limitation of this study is that the two formats of medication education is they contain different content, making it difficult to determine what the patients preferred about the patient-centered handouts.
Cooper & Garrett, 2014	Evaluation of patients experience and	Cross-sectional survey of 292 patients	A questionnaire included in the medication	45% of patients preferred medication education to come from	This cross-sectional survey was not specific to the older

	preferences of how medication information and counseling are provided to them during hospitalization.	discharged from the hospital	provided from pharmacy based on the Picker Patient Experience Questionnaire which is validated and widely used.	the doctor, 33% the pharmacist, and 22% the nurse.	adult population or to written educational materials but does shed light on patient preference of education delivery.
Meranius & Marmstål Hammar, 2016	Evaluate the experience in health care of older adults with multimorbidity on their medication self-management.	Qualitative study including 20 older adults	Interviews were conducted, recorded, and analyzed for themes.	Patients report that there is a lack of participation in health care communication which leads them to feel abandoned during self-management and leads to risk taking behaviors. The health care system is an obstacle to self-management especially in the case of multiple providers prescribing different medications.	Limitations are the small sample size of this study Qualitative research helps readers understand the patient experience and story.
Knight, Thompson, Mathie, & Dickinson, 2013	Explore the experience of medication management of older adults after discharge from the hospital.	Qualitative study including 19 older adults or caregivers of older adults.	Interviews were recoded, transcribed, and analyzed.	In general, older people were dissatisfied with the communication both verbal and written they were provided with on medications during hospitalization and at discharge. Older adults report difficulty managing medications after discharging due to inaccurate lists, not enough information on medication changes, or a lack of time to be able to ask questions.	The small sample size and qualitative design are both limitations to this study.
Modig, Kristensson, Troein, Brorsson, Midlöv, 2012	Explore the experience of frail older adults receiving medication education and preference for information should be given.	Qualitative study involving 12 frail older adults age 68-88 years.	Interviews were recorded, transcribed, and analyzed for themes of 'comfortable with information' and 'insecure with information'.	Factors that aided in feeling comfortable with information were: trust and confidence in the provider, sufficient information given at appropriate level without medical jargon, knowing how to ask questions or seek more information. Factors that were associated with the theme of feeling unsure with the medication information were: distrust of the health care system or provider,	The small sample size and qualitative design are both limitations to this study.

				deficient information like not being provided with explanation or written materials, and lack of availability of the provider to ask questions.	
Savaş & Evcik, 2001	Evaluate how written information effects the understanding of patients on NSAIDS	Post-test randomize pilot study of 91 patients with lower back pain in Turkey randomized into 3 groups: verbal education, written education, both written and verbal education	Administration of education and post-test to assess knowledge delivered 7-10 days after education delivery.	Patients that received both verbal and written education scored significantly higher than those that received verbal or written education alone. Those who received written education only scored significantly higher than those who received verbal education only. Subjects scored lower on questions regarding larger medical terms suggesting that simplified wording may have increased understanding.	Limitations included the small sample size and the setting of Turkey. This study may not be generalizable. This study was not specific to the older adult population.
Jolly, Scott, & Sanford, 1995	Examine whether simplification of discharge instructions improve patient comprehension.	Post-test design of 440 patients discharging from the emergency department.	Patients were given a simplified discharge instruction for wound care or sprain care, after 10 minutes the patient were given a five-question test to evaluate knowledge. These results were compared to results of a previous study using the standard discharge instructions.	Patients scored significantly higher with the simplified discharge instructions compared to results of the previous study testing comprehension with standard discharge instructions ($p<.01$).	This study was not specific to the older adult population or medication education. It does show that significant improvement in comprehension can be obtained via simplification of written educational materials.
Aker, Beck, Papay, Cantu, Ellis, Keravich, & Bibeau, 2013	Examine subjects' ability to navigate and understand written health information, as well as their preference based on format and content.	Non-randomized post-test study of 105 individuals, 15 of which had low literacy levels.	Subjects were provided with one of three formats of medication education (standard, simplified, or bubble), after	Subjects assigned to the standard education had significantly decreased comprehension and navigation. It took this group twice as long to navigate to the appropriate information. 75% of patients	Limitations include non-randomized assignment and small sample size. This study did not focus on the older adult population.

			reviewing the handout, patients were asked questions to assess navigation and comprehension. Finally, they were shown examples of the three types and asked to state their preferred format.	indicated they preferred and would be more likely to read the simplified format.	
Bagge, Norris, Heydon, & Tordoff, 2014	Examine how older adults discharged from the hospital understood and managed medication at home.	Qualitative study of 40 older adults who were discharged from the hospital with medication changes,	Semi-structured interviews were recorded and analyzed for themes.	Older adults had a median of four medication changes at discharge. Themes that emerged were trust in the physicians, feeling reluctant to ask hospital staff about medication changes, being unaware of medication changes, and concern or difficulty incorporating changes into their home regimen.	Qualitative design and small sample size limit this study.

Note: CGP=clinical practice guideline; RCT =randomized controlled trial; ADL=activities of daily living.

Table 2

Data Collection Tool for HCAHPS Scores—Medication Communication Domain

HCAHPS scores for the Medication Communication Domain							
Month	*HCAHPS Score*	*Median*	*50th percentile benchmark*	*75th percentile benchmark*	*90th percentile benchmark*	*magnet*	*mean*
Sep-16	87.5	62.3	63.3	67.6	73.9	65.0	61.2
Oct-16	64.6	62.3	63.3	67.6	73.9	65.0	61.2
Nov-16	36.4	62.3	63.3	67.6	73.9	65.0	61.2
Dec-16	62.8	62.3	63.3	67.6	73.9	65.0	61.2
Jan-17	61.5	62.3	63.3	67.6	73.9	65.0	61.2
Feb-17	69.5	62.3	63.3	67.6	73.9	65.0	61.2
Mar-17	50.0	62.3	63.3	67.6	73.9	65.0	61.2
Apr-17	63.6	62.3	63.3	67.6	73.9	65.0	61.2
May-17	50.0	62.3	63.3	67.6	73.9	65.0	61.2
Jun-17	70.8	62.3	63.3	67.6	73.9	65.0	61.2
Jul-17	54.2	62.3	63.3	67.6	73.9	65.0	61.2
Aug-17	53.8	62.3	63.3	67.6	73.9	65.0	61.2
Sep-17	63.6	62.3	63.3	67.6	73.9	65.0	61.2
Oct-17	53.0	62.3	63.3	67.6	73.9	65.0	61.2
Nov-17	58.1	62.3	63.3	67.6	73.9	65.0	61.2
Dec-17	83.3	62.3	63.3	67.6	73.9	65.0	61.2
Jan-18	48.1	62.3	63.3	67.6	73.9	65.0	61.2
Feb-18	61.8	62.3	63.3	67.6	73.9	65.0	61.2
Mar-18	40.5	62.3	63.3	67.6	73.9	65.0	61.2
Apr-18	77.1	62.3	63.3	67.6	73.9	65.0	61.2
May-18	71.4	62.3	63.3	67.6	73.9	65.0	61.2
Jun-18	65.6	62.3	63.3	67.6	73.9	65.0	61.2

Note. Audit completed monthly. This patient experience question measures patient satisfaction and patient reported frequency education on new medications. This domain is made up of two questions: “Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?” and “Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?” (CMS, 2017, p. 3).

Table 3

Data Collection Tool for HCAHPS Scores—New Medication Purpose Explained by Staff

HCAHPS scores for "Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?"							
Month	*HCAHP Score*	*Median*	*50th percentile benchmark*	*75th percentile benchmark*	*90th percentile benchmark*	*Magnet*	*Mean*
Sep-16	66.9	71.4	77.2	81.0	84.4	79.0	71.2
Oct-16	66.7	71.4	77.2	81.0	84.4	79.0	71.2
Nov-16	63.6	71.4	77.2	81.0	84.4	79.0	71.2
Dec-16	70.0	71.4	77.2	81.0	84.4	79.0	71.2
Jan-17	76.9	71.4	77.2	81.0	84.4	79.0	71.2
Feb-17	92.9	71.4	77.2	81.0	84.4	79.0	71.2
Mar-17	53.3	71.4	77.2	81.0	84.4	79.0	71.2
Apr-17	81.8	71.4	77.2	81.0	84.4	79.0	71.2
May-17	54.5	71.4	77.2	81.0	84.4	79.0	71.2
Jun-17	75.0	71.4	77.2	81.0	84.4	79.0	71.2
Jul-17	58.3	71.4	77.2	81.0	84.4	79.0	71.2
Aug-17	61.5	71.4	77.2	81.0	84.4	79.0	71.2
Sep-17	72.7	71.4	77.2	81.0	84.4	79.0	71.2
Oct-17	72.7	71.4	77.2	81.0	84.4	79.0	71.2
Nov-17	73.3	71.4	77.2	81.0	84.4	79.0	71.2
Dec-17	88.9	71.4	77.2	81.0	84.4	79.0	71.2
Jan-18	69.2	71.4	77.2	81.0	84.4	79.0	71.2
Feb-18	76.5	71.4	77.2	81.0	84.4	79.0	71.2
Mar-18	47.6	71.4	77.2	81.0	84.4	79.0	71.2
Apr-18	85.7	71.4	77.2	81.0	84.4	79.0	71.2
May-18	90.5	71.4	77.2	81.0	84.4	79.0	71.2
Jun-18	68.0	71.4	77.2	81.0	84.4	79.0	71.2

Note. Audit completed monthly. This patient experience question measures patient satisfaction and patient-reported frequency of staff explaining the purpose of new medications prior to first dose (CMS, 2017, p. 3).

Table 4

Data Collection Tool for HCAHPS Scores—New Side Effects Explained by Staff

HCAHPS Scores for "Before giving you any new medicine, how often did the hospital staff describe possible side effects in a way you could understand?"							
Month	*HCAHPS Score*	*Median*	*50th percentile benchmark*	*75th percentile benchmark*	*90th percentile benchmark*	*Magnet*	*Mean*
Sep-16	48.7	46.9	49.5	54.7	59.7	50.0	48.5
Oct-16	62.5	46.9	49.5	54.7	59.7	50.0	48.5
Nov-16	9.1	46.9	49.5	54.7	59.7	50.0	48.5
Dec-16	55.6	46.9	49.5	54.7	59.7	50.0	48.5
Jan-17	46.2	46.9	49.5	54.7	59.7	50.0	48.5
Feb-17	46.2	46.9	49.5	54.7	59.7	50.0	48.5
Mar-17	46.7	46.9	49.5	54.7	59.7	50.0	48.5
Apr-17	45.5	46.9	49.5	54.7	59.7	50.0	48.5
May-17	45.5	46.9	49.5	54.7	59.7	50.0	48.5
Jun-17	66.7	46.9	49.5	54.7	59.7	50.0	48.5
Jul-17	50.0	46.9	49.5	54.7	59.7	50.0	48.5
Aug-17	46.2	46.9	49.5	54.7	59.7	50.0	48.5
Sep-17	54.5	46.9	49.5	54.7	59.7	50.0	48.5
Oct-17	33.3	46.9	49.5	54.7	59.7	50.0	48.5
Nov-17	42.9	46.9	49.5	54.7	59.7	50.0	48.5
Dec-17	77.8	46.9	49.5	54.7	59.7	50.0	48.5
Jan-18	26.9	46.9	49.5	54.7	59.7	50.0	48.5
Feb-18	47.1	46.9	49.5	54.7	59.7	50.0	48.5
Mar-18	33.3	46.9	49.5	54.7	59.7	50.0	48.5
Apr-18	68.4	46.9	49.5	54.7	59.7	50.0	48.5
May-18	52.4	46.9	49.5	54.7	59.7	50.0	48.5
Jun-18	62.5	46.9	49.5	54.7	59.7	50.0	48.5

Note. Audit completed monthly. This patient experience question measures patient satisfaction and patient reported frequency education on new medication side effects.

Table 5

Data Collection Tool for HCAHPS Scores—Care Transitions Domain

HCAHPS scores for "When I left the hospital, I clearly understood the purpose for taking each of my medications"							
Month	*HCAHPS score*	*median*	*50th percentile benchmark*	*75th percentile benchmark*	*90th percentile benchmark*	*Magnet*	*mean*
Sep-16	64.3	54.9	60.6	65.2	70.0	64.0	55.8
Oct-16	57.9	54.9	60.6	65.2	70.0	64.0	55.8
Nov-16	50.0	54.9	60.6	65.2	70.0	64.0	55.8
Dec-16	46.2	54.9	60.6	65.2	70.0	64.0	55.8
Jan-17	47.8	54.9	60.6	65.2	70.0	64.0	55.8
Feb-17	58.8	54.9	60.6	65.2	70.0	64.0	55.8
Mar-17	57.1	54.9	60.6	65.2	70.0	64.0	55.8
Apr-17	51.7	54.9	60.6	65.2	70.0	64.0	55.8
May-17	55.0	54.9	60.6	65.2	70.0	64.0	55.8
Jun-17	57.1	54.9	60.6	65.2	70.0	64.0	55.8
Jul-17	61.9	54.9	60.6	65.2	70.0	64.0	55.8
Aug-17	50.0	54.9	60.6	65.2	70.0	64.0	55.8
Sep-17	50.0	54.9	60.6	65.2	70.0	64.0	55.8
Oct-17	51.9	54.9	60.6	65.2	70.0	64.0	55.8
Nov-17	70.6	54.9	60.6	65.2	70.0	64.0	55.8
Dec-17	61.5	54.9	60.6	65.2	70.0	64.0	55.8
Jan-18	54.8	54.9	60.6	65.2	70.0	64.0	55.8
Feb-18	54.3	54.9	60.6	65.2	70.0	64.0	55.8
Mar-18	50.0	54.9	60.6	65.2	70.0	64.0	55.8
Apr-18	54.8	54.9	60.6	65.2	70.0	64.0	55.8
May-18	60.9	54.9	60.6	65.2	70.0	64.0	55.8
Jun-18	60.0	54.9	60.6	65.2	70.0	64.0	55.8

Note. Audit completed monthly. This patient experience question measures patient satisfaction and self-reported understanding of education (CMS, 2017, p. 4).

Table 6

Data Collection Tool for Documentation

New Medication	*Time Ordered*	*First Dose*	*Education Documented within 24 hours of Order?*	*doc prior to 1st dose?*	*ready to learn assessment completed?*	*pt ready to learn?*	*Barriers to Learning*

Note. New Medication= Any Medication that is not on the "Documented Medications by Hx" list; Time ordered=The time the medication order was placed by the provider; First dose=The time the medication was given first; Education Documented within 24 hours of order=Education documented within 24 hours of the order being placed by the provider; Doc prior to 1st dose=documented education prior to the time of the first dose; Ready to learn assessment completed?=Charting completed in IVIEW Education under "Patient ready to learn?"; Pt ready to learn?=Yes or no documented in the field "Patient ready to learn?"; Barriers to learning= any tab checked in the "Barriers to learning" field in IVIEW.

Table 7

Stakeholder Identification and Involvement in Improvement Project

Stakeholder	***Role in New Medication Education***
Patient/Family/Caregiver	Consumer of the new medication education. Responsible for incorporating new medication into current medication regimen after being discharged from the hospital. Type and amount of information should match their expectations, literacy levels, and language preferences. The patient, family, or caregiver is responsible for patient experience score responses.
Registered Nurse (RN)	Responsible for recognizing if an order is a new medication for a patient, printing out the medication handout, providing verbal and written information to the patient. The RN provides vital information for this project on how the medication education process can be simplified and streamlined to fit into the bedside nurse's workflow. For this project, RNs that make up the units Patient Experience Committee have agreed to participate.
Pharmacist	The pharmacist provides guidance on medication ordering and communication with the RN about new medications. Pharmacy provides access to medication handouts and educational resources. Currently the pharmacist is working on standardizing 1-page medication handouts for the most frequently prescribed medications on the SCU.
Clinical Nurse Leader (CNL)	The CNL provides guidance on implementation of quality improvement projects within the microsystem. The CNL verifies that improvement science is being utilized appropriately and that projects align with microsystem and organizational aims.
SCU and organizational Leadership	Verifies project is aligned with strategic aims. Offers support and approval to move forward with improvement project.
Information Technology (IT)	The IT department helps facilitate data collection and provides information vital to the project, such as, extracting data from the electronic charts to verify the most commonly prescribed medications.
Quality Department	The quality department can help by providing HCAHPS data, and more information about how those scores influence value-based reimbursement.
MSN Student	Assesses the microsystem, identifies the problem, collects baseline data, explores the process, examines the literature, identifies, and implements improvement efforts sets metrics and goals, collaborates with other stakeholders, monitors, and displays metrics and progress towards goals, creates sustainment plan, hands-off project, and sustainment to patient experience committee.

Note. HCAHPS= Hospital Consumer Assessment of Healthcare Providers and Systems; MSN=Master of Science in Nursing.

Table 8

Metrics Table

Metrics	***Baseline***	***Goal***	***Actual***
HCAHPS mean score for Medication Communication Domain above 50th percentile (63.3)	59.96	63.30	65.6
HCAHPS mean score for "staff told you what your new med was for" above 50th percentile (77.2)	69.34	77.20	68
HCAHPS mean score for "staff told you side effects were on new med" above 50th percentile (49.5)	46.64	49.50	62.5
HCAHPS mean score for "when I went home I knew purpose for taking each of my medications" above 50th percentile (60.6)	55.35	60.60	60
New medication education documentation performed within 24 hours of order.	3	60.00	24.00
20% increase in percentage of nurses self-reporting written medication education completed 75-100% of the time.	5.88	7.06	7.14
20% increase in the percentage of nurses self-reported frequency of pharmacy handout.	47.06	56.50	42.86

Note. HCAHPS= Hospital Consumer Assessment of Healthcare Providers and Systems.

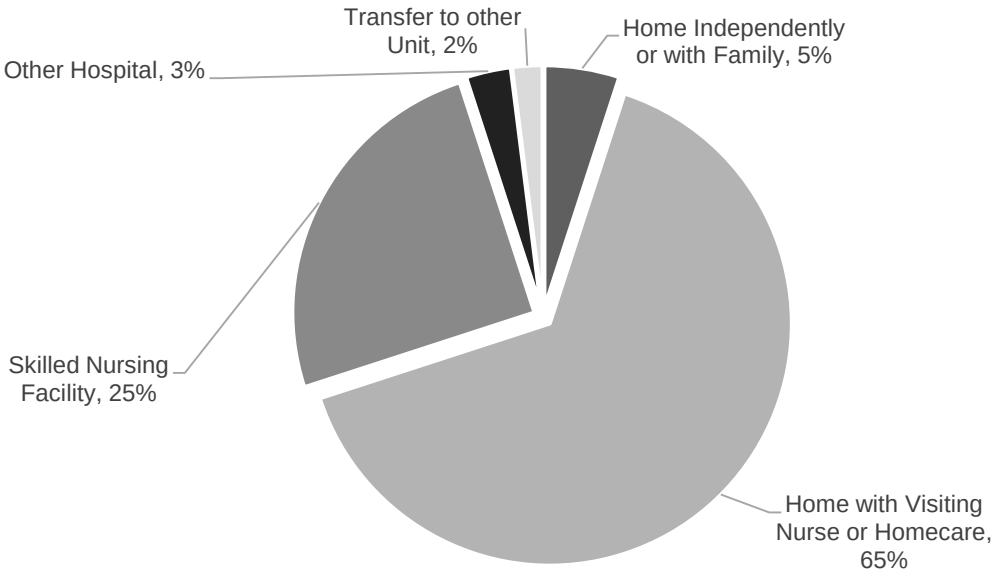


Figure 1. Disposition status for patients on the SCU. Only 5% of the patients are discharged home without additional support such as home care or a visiting nurse. A total of 70% of patients are discharged to their home.

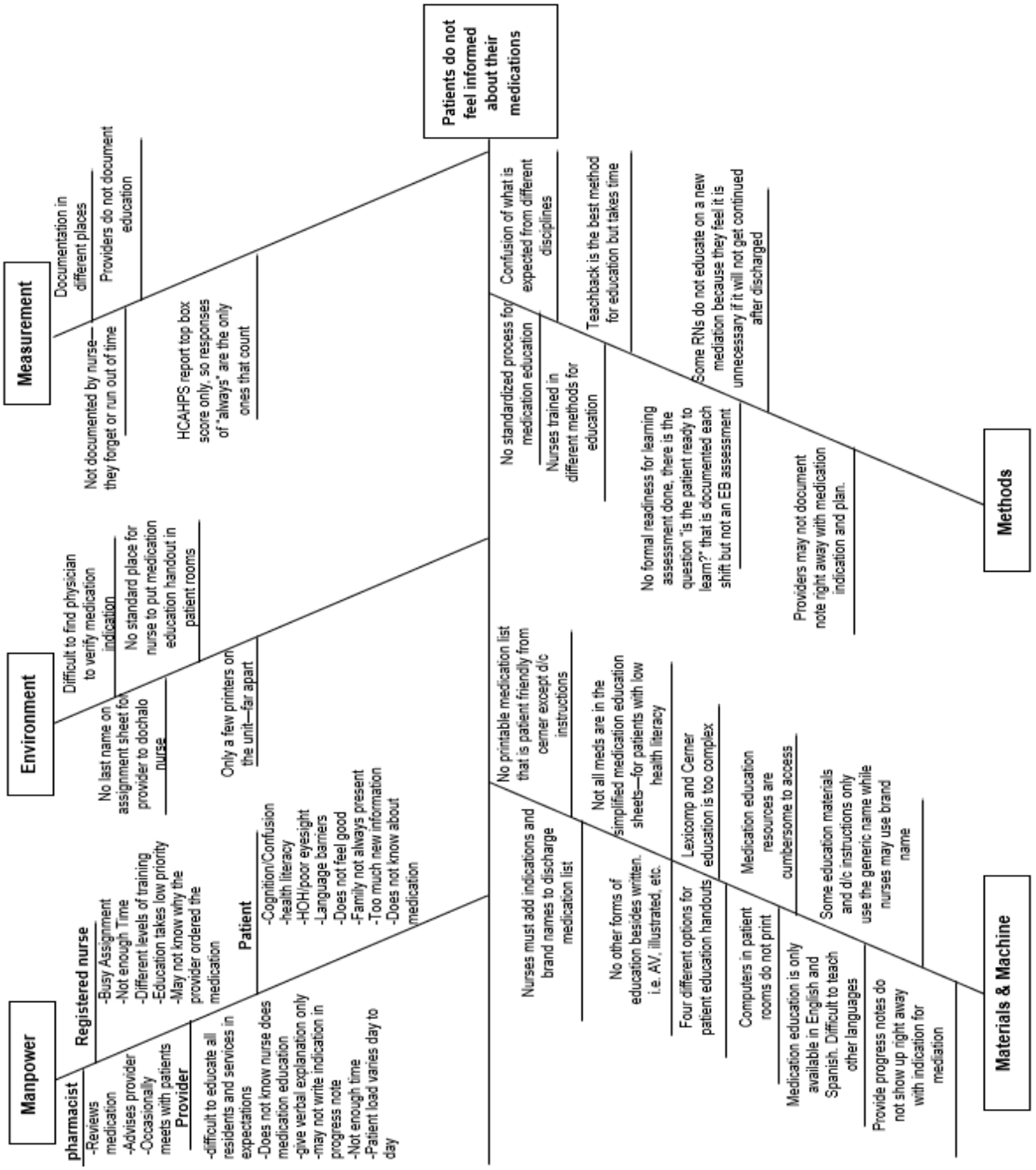


Figure 2. Cause and effect diagram for patients not feeling informed about their medications. Many barriers to teaching older adult patients about new medications were identified by nurses and physicians during a root cause analysis. HOH=hard of hearing; AV=audio visual; d/c=discharge; HCAHPS= Hospital Consumer Assessment of Healthcare Providers and Systems survey; EB=evidence-based.

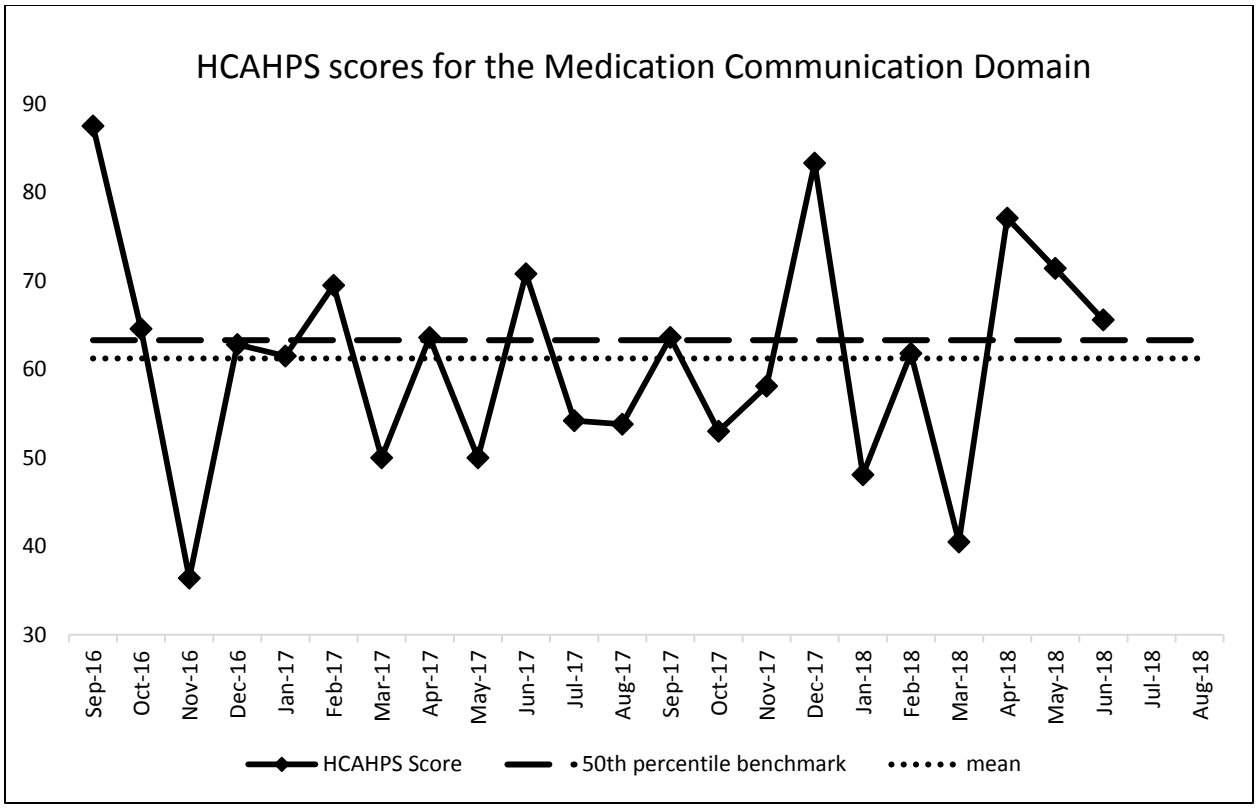


Figure 3. FY17-FY18 HCAHPS response for the effective communication about medicines domain for the SCU. This domain is a combination of scores from the questions, "Before giving you any new medicine, how often did hospital staff tell you what the medicine was for" and "Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand" (CMS, 2017, p. 3).

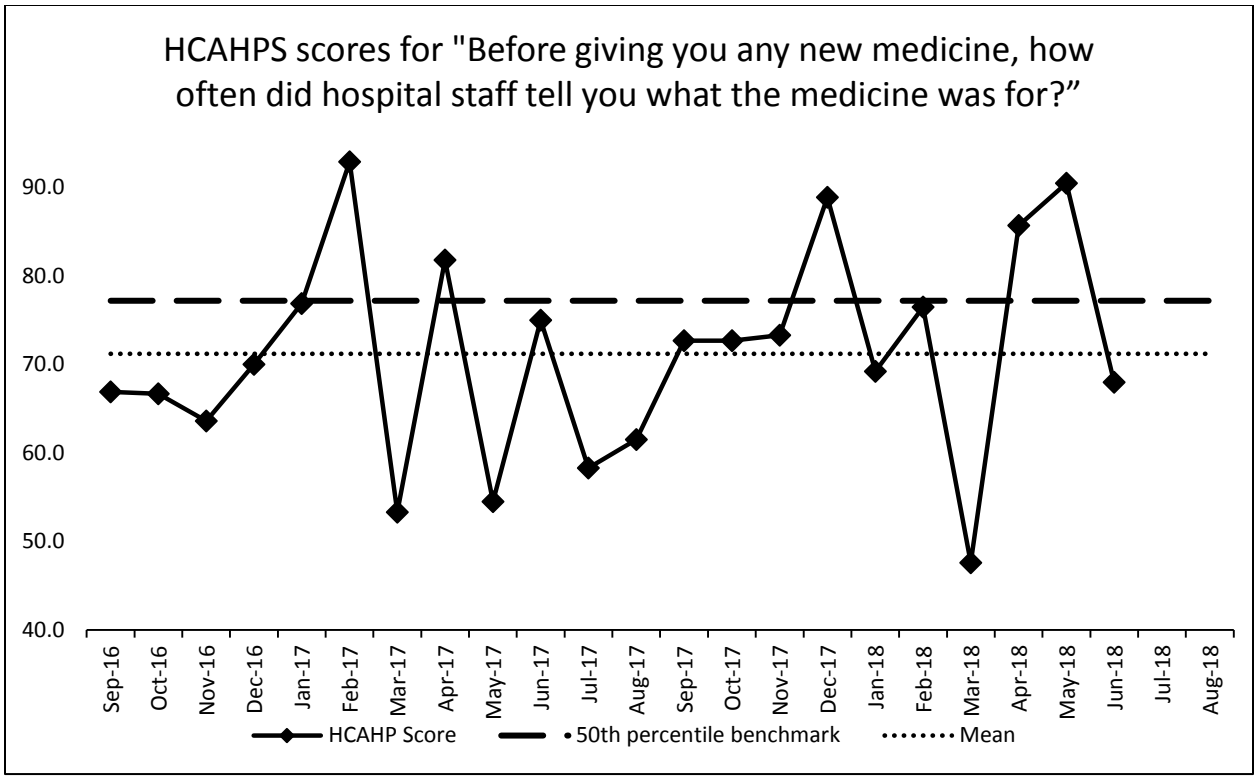


Figure 4. HCAHPS Scores for question "Before giving you any new medicine, how often did hospital staff tell you what the medicine was for” (CMS, 2017, p. 3).

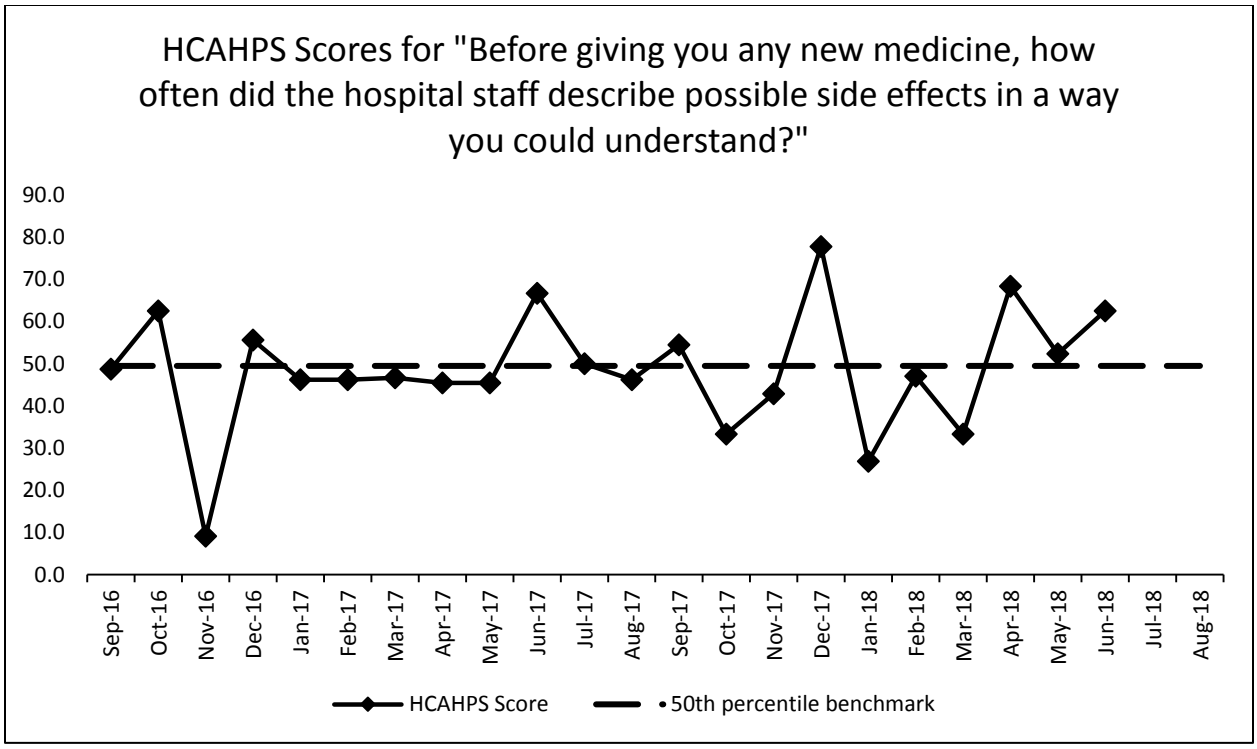


Figure 5. HCAHPS Scores for question " Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand" (CMS, 2017, p. 3).

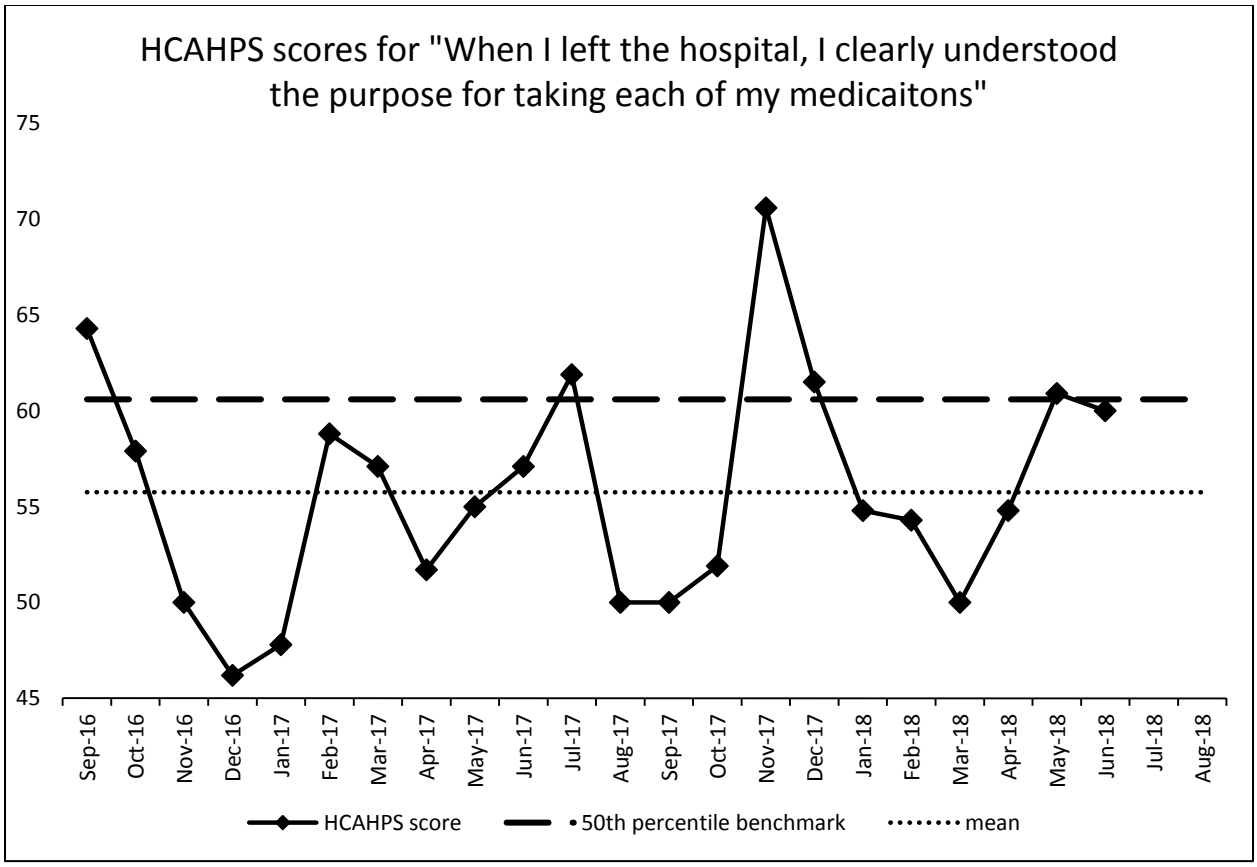


Figure 6. FY2017 HCAHPS response to "When I left the hospital, I clearly understood the purpose of taking each of my medications" (CMS, 2017, p. 4).

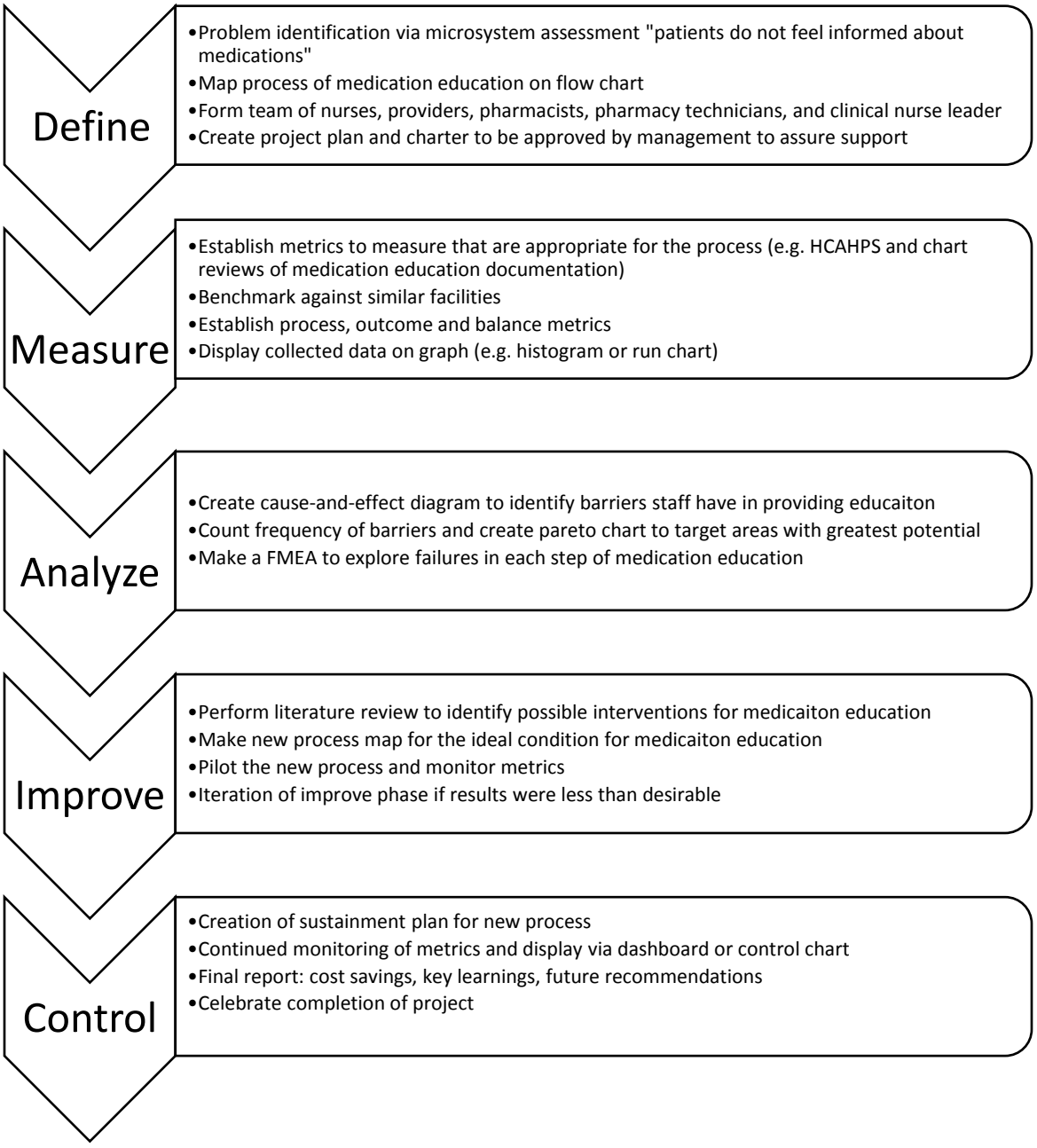


Figure 7. Adaptation of the DMAIC model to address the process of medication education on a SCU (Furterer, 2014).

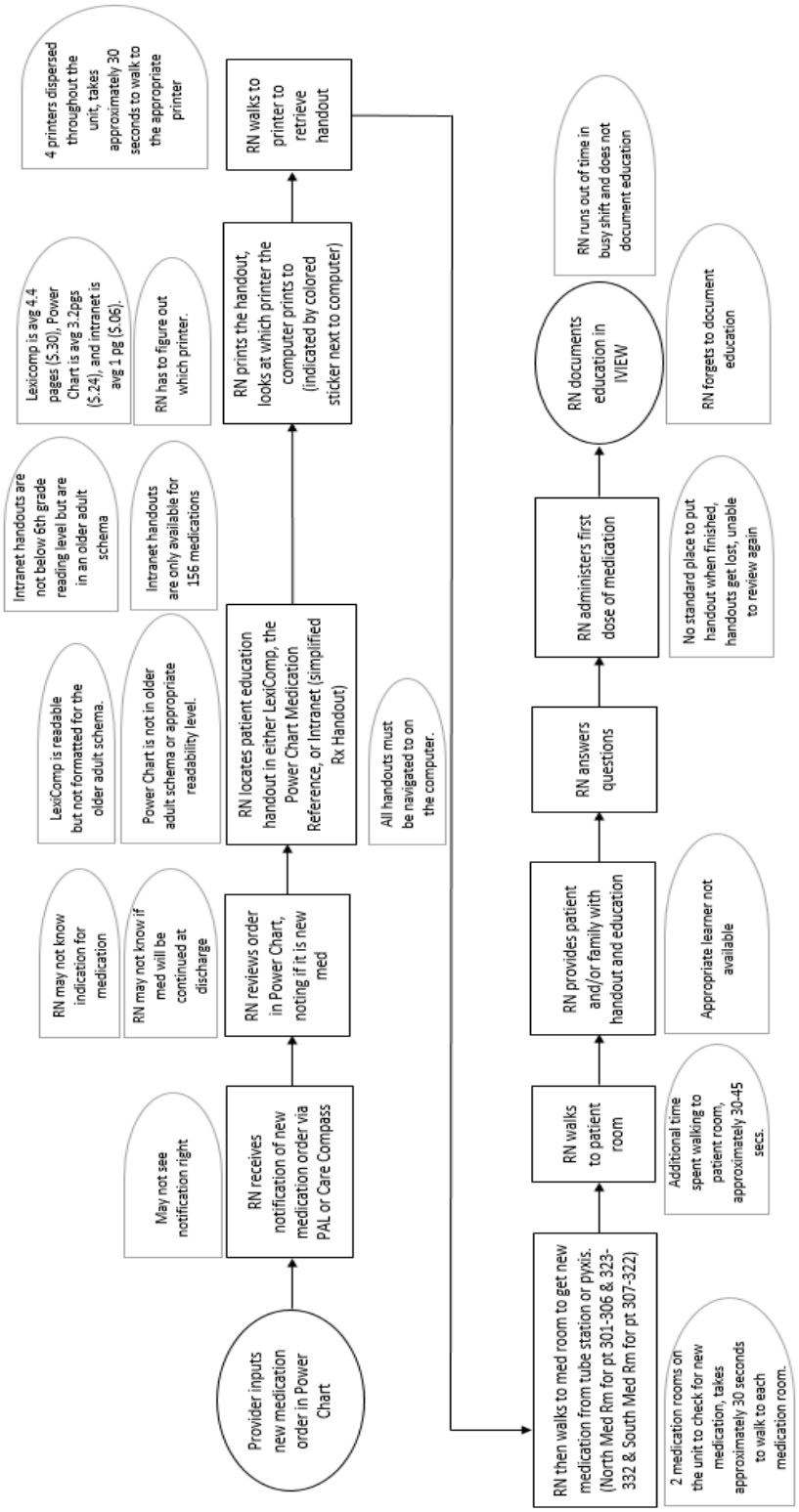


Figure 8. Flow chart of current patient education process for new medications including delays or barriers to completing steps.

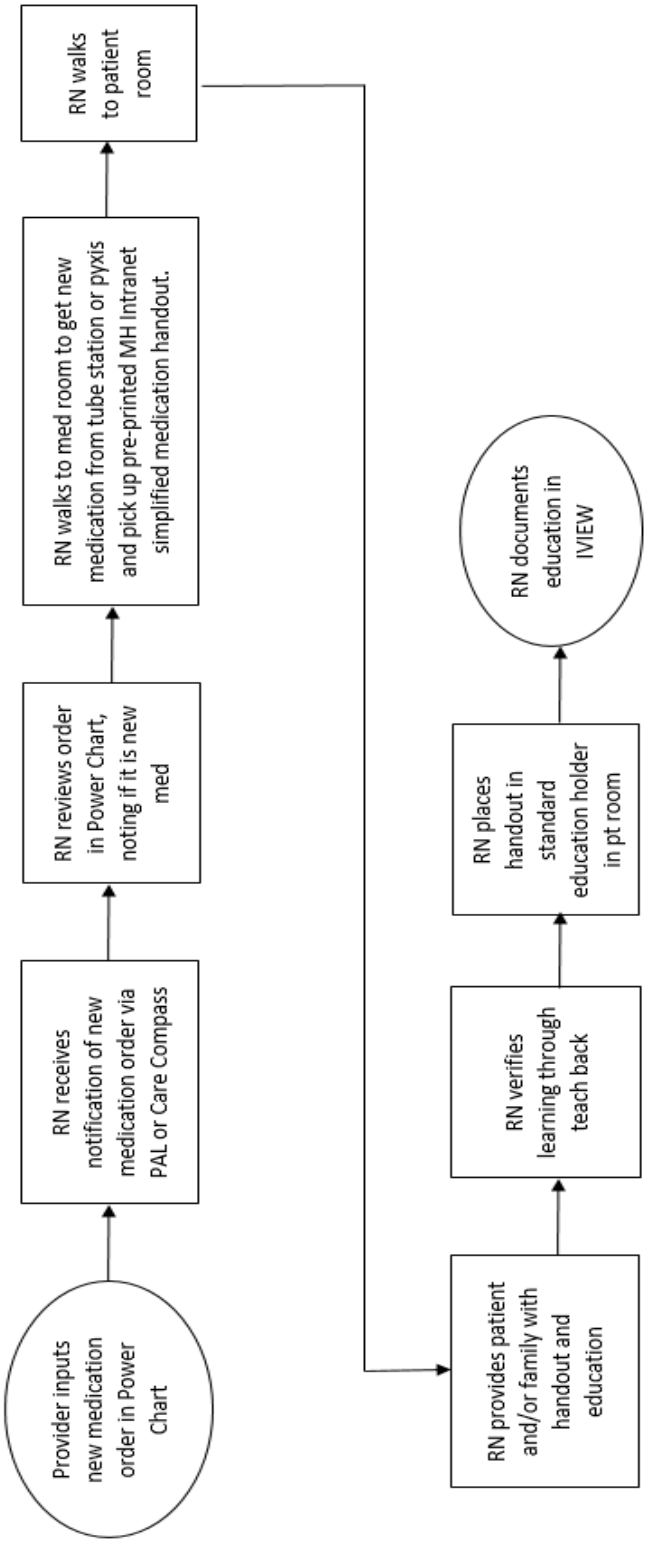
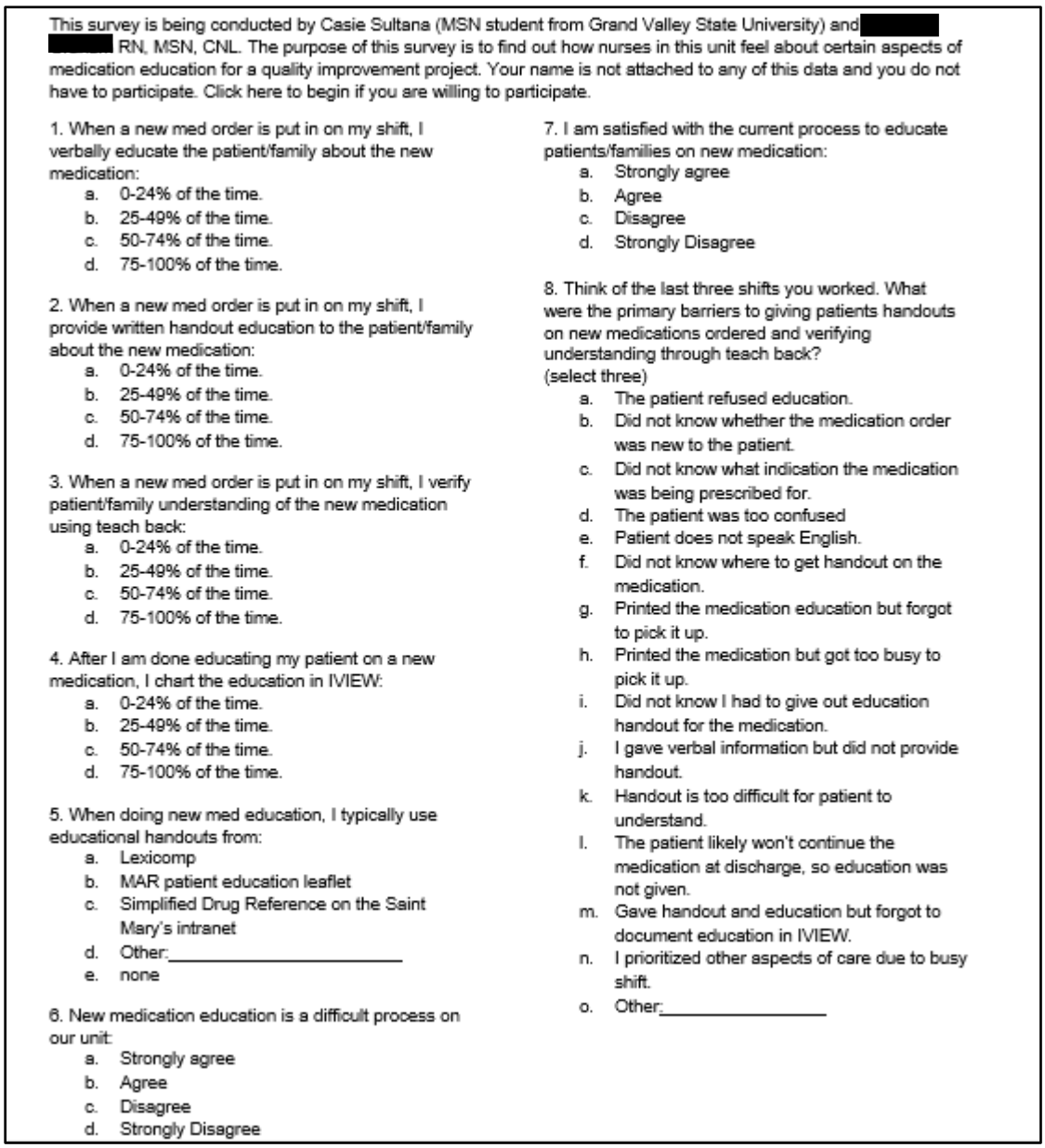


Figure 9. Flow chart of new ideal process for new medication education.



This survey is being conducted by Casie Sultana (MSN student from Grand Valley State University) and [redacted] RN, MSN, CNL. The purpose of this survey is to find out how nurses in this unit feel about certain aspects of medication education for a quality improvement project. Your name is not attached to any of this data and you do not have to participate. Click here to begin if you are willing to participate.

1. When a new med order is put in on my shift, I verbally educate the patient/family about the new medication:
   a. 0-24% of the time.
   b. 25-49% of the time.
   c. 50-74% of the time.
   d. 75-100% of the time.

2. When a new med order is put in on my shift, I provide written handout education to the patient/family about the new medication:
   a. 0-24% of the time.
   b. 25-49% of the time.
   c. 50-74% of the time.
   d. 75-100% of the time.

3. When a new med order is put in on my shift, I verify patient/family understanding of the new medication using teach back:
   a. 0-24% of the time.
   b. 25-49% of the time.
   c. 50-74% of the time.
   d. 75-100% of the time.

4. After I am done educating my patient on a new medication, I chart the education in IVIEW:
   a. 0-24% of the time.
   b. 25-49% of the time.
   c. 50-74% of the time.
   d. 75-100% of the time.

5. When doing new med education, I typically use educational handouts from:
   a. Lexicomp
   b. MAR patient education leaflet
   c. Simplified Drug Reference on the Saint Mary's intranet
   d. Other:_____
   e. none

6. New medication education is a difficult process on our unit:
   a. Strongly agree
   b. Agree
   c. Disagree
   d. Strongly Disagree

7. I am satisfied with the current process to educate patients/families on new medication:
   a. Strongly agree
   b. Agree
   c. Disagree
   d. Strongly Disagree

8. Think of the last three shifts you worked. What were the primary barriers to giving patients handouts on new medications ordered and verifying understanding through teach back?
(select three)
   a. The patient refused education.
   b. Did not know whether the medication order was new to the patient.
   c. Did not know what indication the medication was being prescribed for.
   d. The patient was too confused
   e. Patient does not speak English.
   f. Did not know where to get handout on the medication.
   g. Printed the medication education but forgot to pick it up.
   h. Printed the medication but got too busy to pick it up.
   i. Did not know I had to give out education handout for the medication.
   j. I gave verbal information but did not provide handout.
   k. Handout is too difficult for patient to understand.
   l. The patient likely won't continue the medication at discharge, so education was not given.
   m. Gave handout and education but forgot to document education in IVIEW.
   n. I prioritized other aspects of care due to busy shift.
   o. Other:_____

Figure 10. Nurse survey on new medication education. A survey using the questions in the figure will be sent to all SCU nurses via email. The questions were developed by Casie Sultana (MSN student at GVSU) and reviewed by both the unit CNL and faculty at Grand Valley State University. The survey will be completed prior to the QI project in May 2018 and two months post implementation in July 2018.

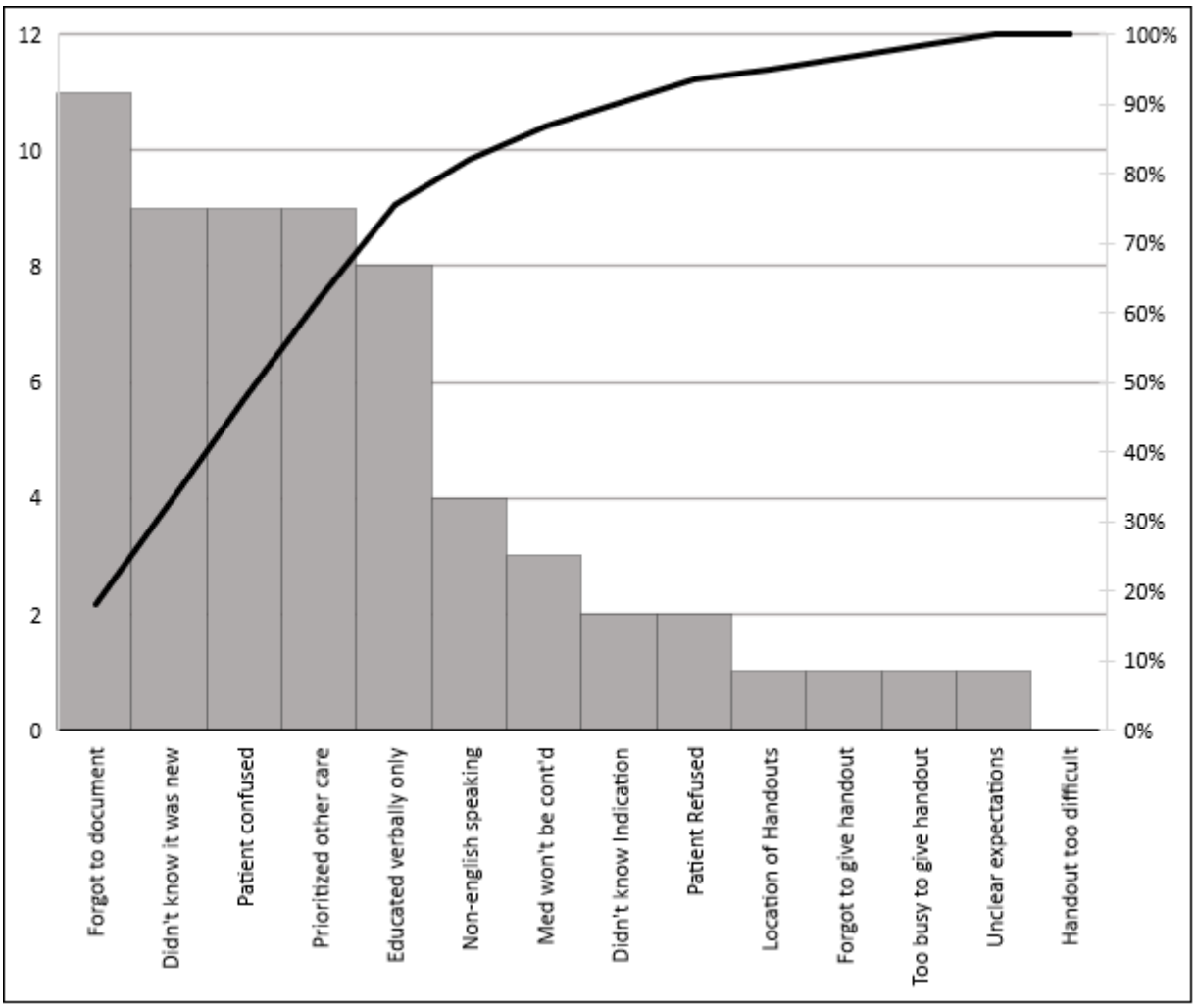
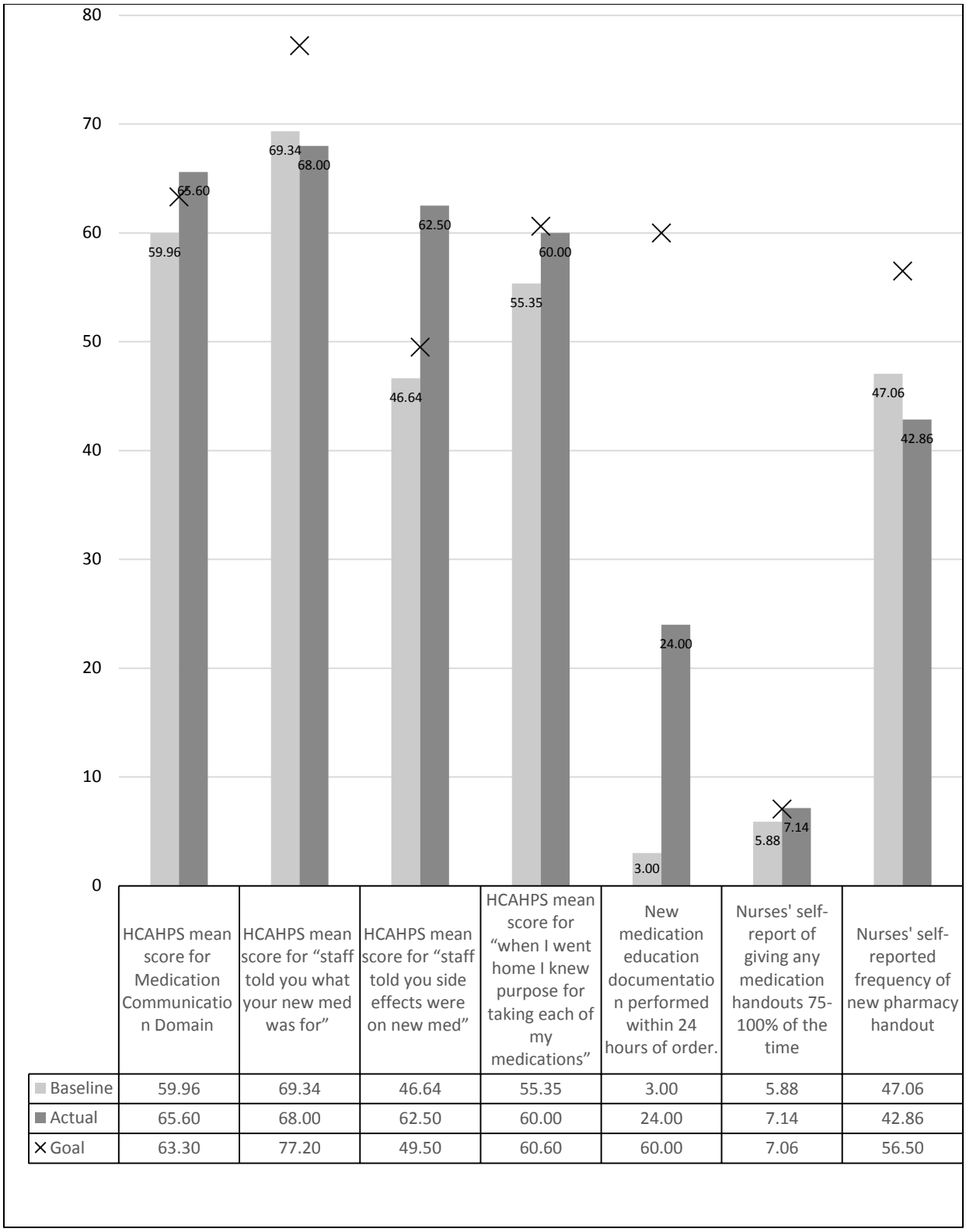


Figure 11. Pareto chart on barriers for nurses to complete new medication education. This pareto chart was created from the responses to question 8 on the post-implementation nurse survey. The top four barriers contribute to 80% of the problem of new medication education and include: the nurse gave the handout and education but forgot to document, the nurse did not know if the medication was new to the patients, the patient was too confused to provide education, and the nurse was too busy and prioritized other aspects of patient care over education.



	HCAHPS mean score for Medication Communication Domain	HCAHPS mean score for "staff told you what your new med was for"	HCAHPS mean score for "staff told you side effects were on new med"	HCAHPS mean score for "when I went home I knew purpose for taking each of my medications"	New medication education documentation performed within 24 hours of order.	Nurses' self-report of giving any medication handouts 75-100% of the time	Nurses' self-reported frequency of new pharmacy handout
Baseline	59.96	69.34	46.64	55.35	3.00	5.88	47.06
Actual	65.60	68.00	62.50	60.00	24.00	7.14	42.86
× Goal	63.30	77.20	49.50	60.60	60.00	7.06	56.50

Figure 12. Comparison of all process and outcome metrics for pre- and post-implementation of the QI project pilot.

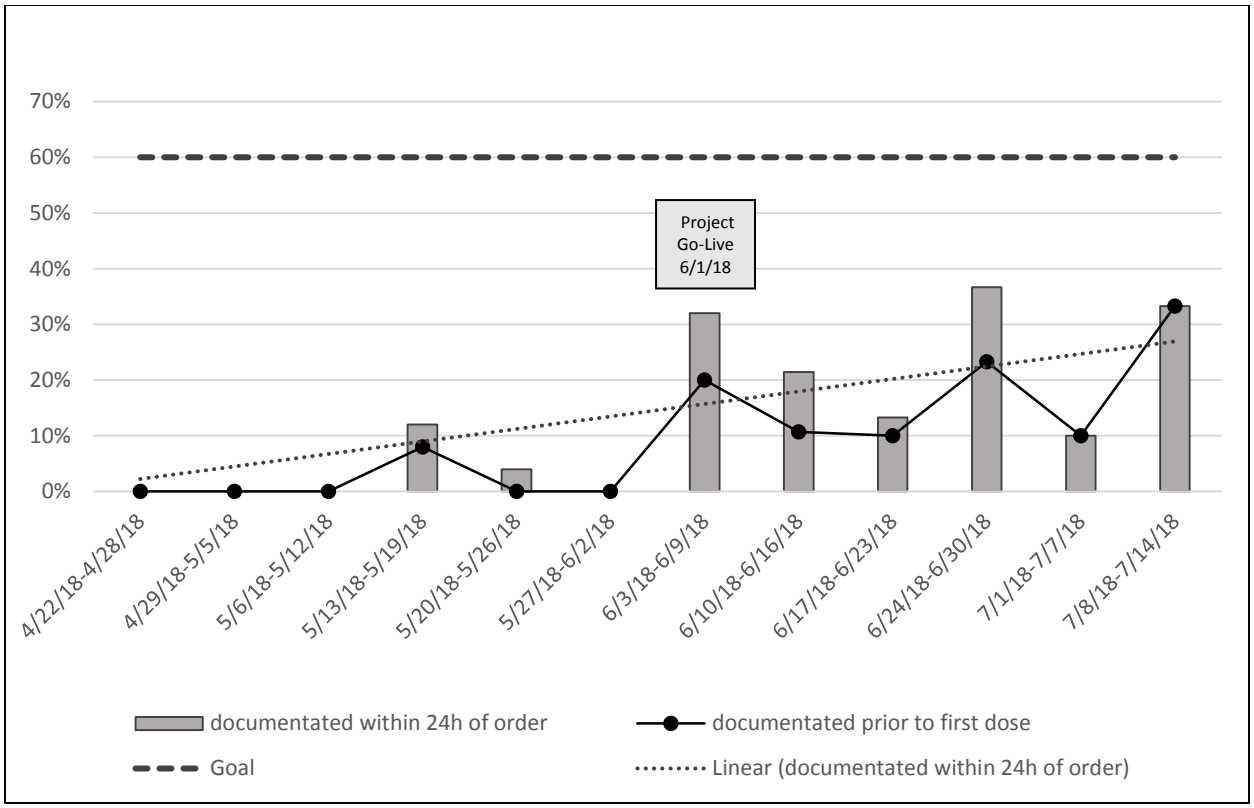


Figure 13. Process metric of documentation of medication teaching presented on a run chart with linear trend line for documentation of new medication education within 24-hours of the new medication order.

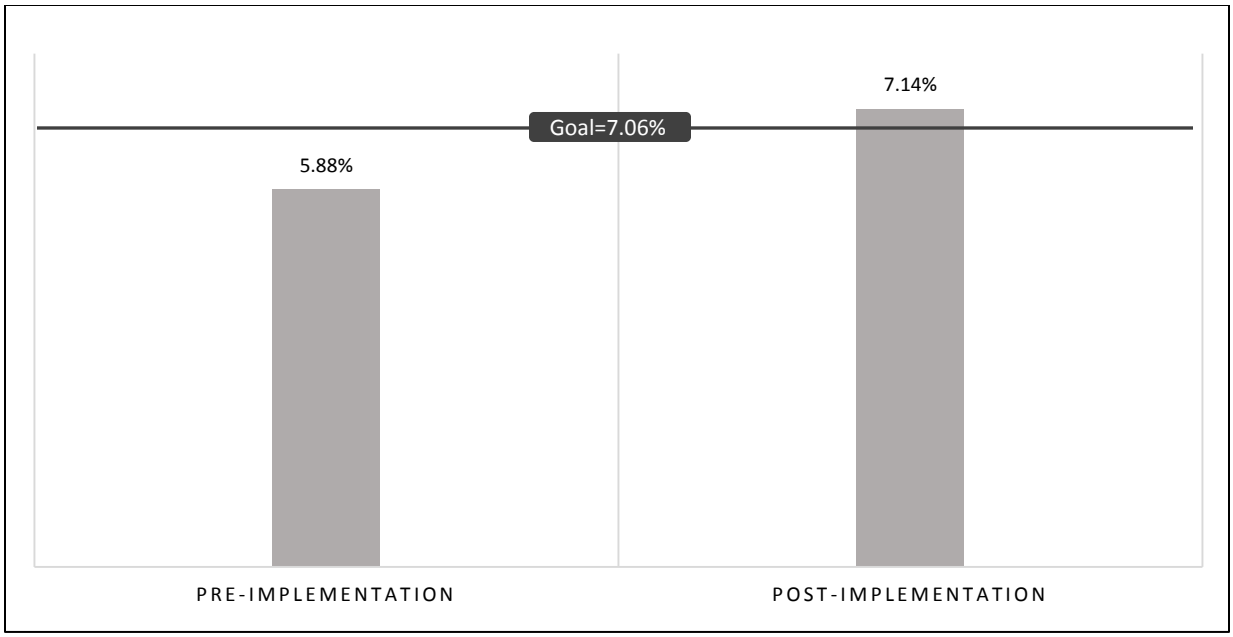


Figure 14. Pre- and Post-Implementation comparison of the percent of nurses that self-reported giving written handouts for new medication education 75-100% of the time. A total of 17 SCU nurses completed the pre-implementation survey and 14 completed the post-implementation survey.

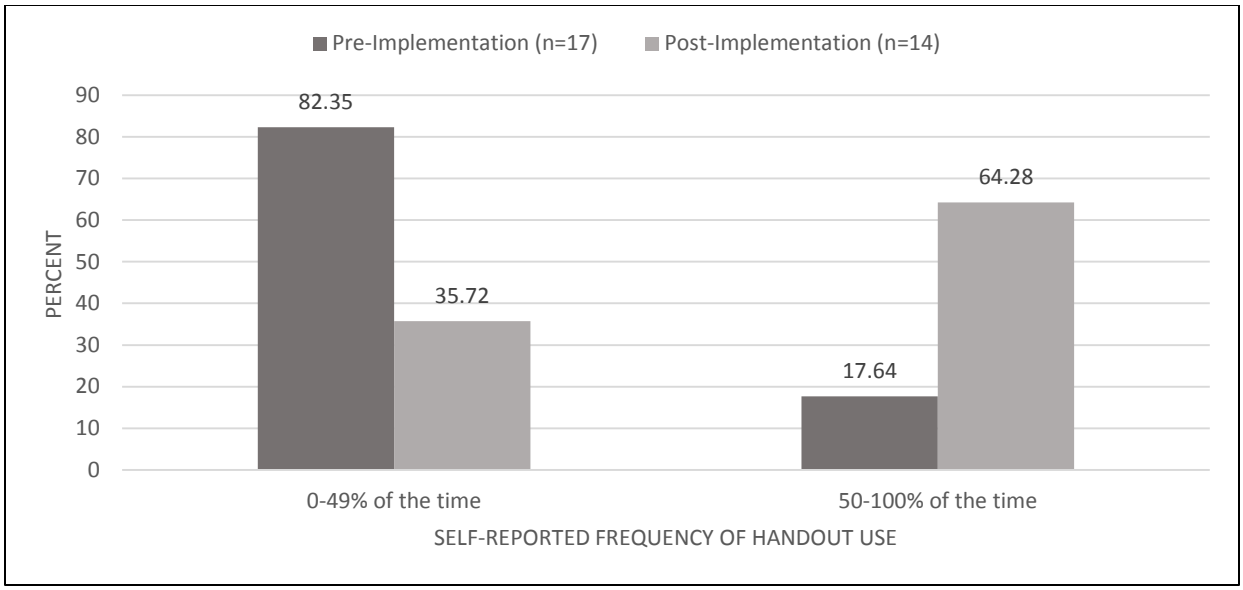


Figure 15. Pre- and post-implementation comparison of nurse self-reported frequency of giving out a written handout for new medications. A total of 17 nurses completed the pre-implementation survey

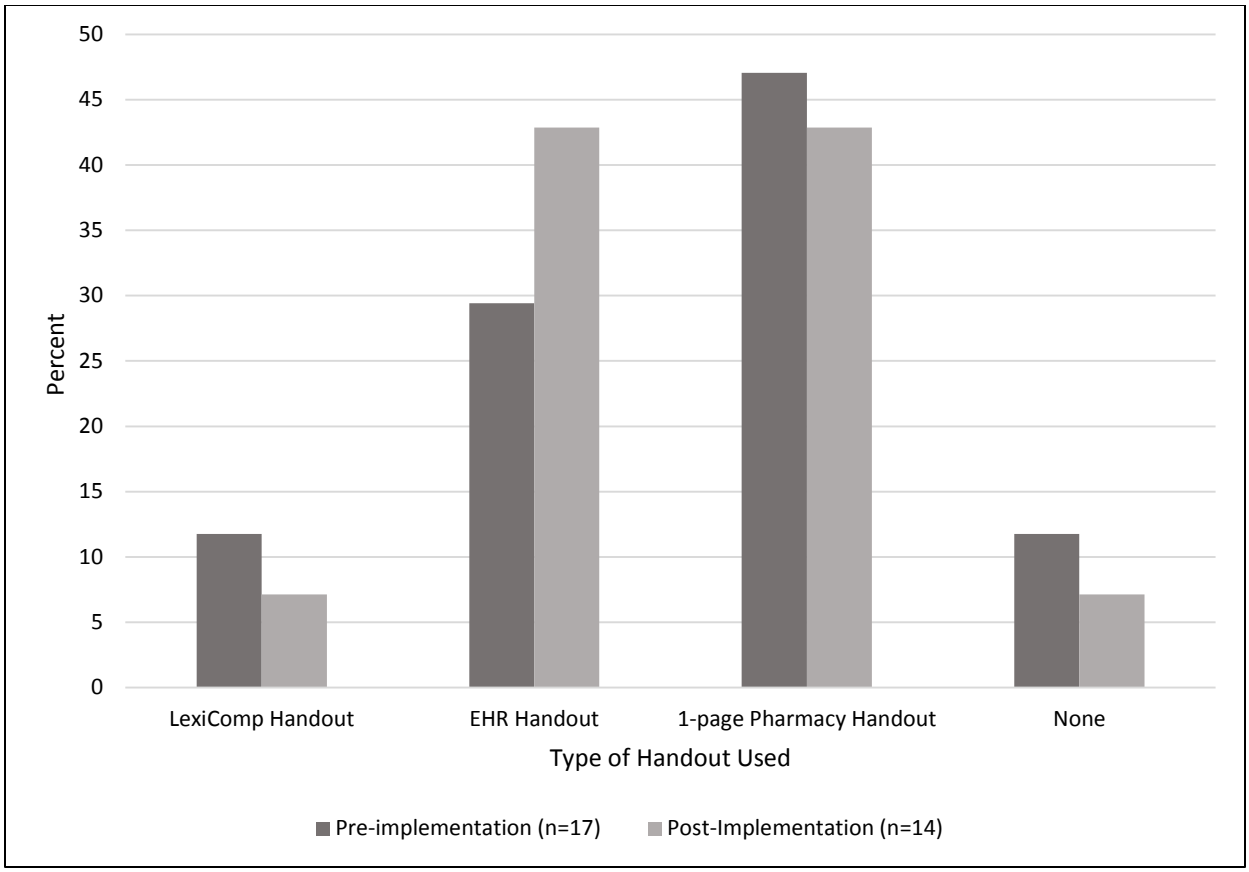


Figure 16. Pre- and post-implementation comparison of the type of handout used. Use of the EHR handouts increased. It was the goal to increase the use of the 1-page pharmacy handouts but self-reported use of these actually declined post-implementation from 47% to 43%. However, the 1-page pharmacy handouts tied for the most frequently used handouts post-implementation.