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A Medication Management Intervention Across Care Transitions

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Abstract

Accurate medication reconciliation with every transition of care is necessary to prevent and eliminate medication discrepancies and errors that may lead to increased hospital readmissions and potential adverse events related to medication errors. For the older population, this is especially important when considering the increasing rates of polypharmacy in this age group. This capstone project evaluated a nurse-led medication reconciliation program, including teaching after patient discharge from a hospital or facility to home, and coordination and communication with patient's primary care provider. The project measured issues with medication reconciliation across care transitions at the individual, provider, system, and community levels, and the impact of nursing interventions through process and outcomes measures. The goals of the program are to support patient safety, improve patient ability to self-manage medication therapy independently or with family support, increase health care quality and perception of quality of life, and decrease health care costs. From a public health perspective, expansion of this nurse-led program model has potential for significant positive effect on health care management and outcomes across a larger population.

Keywords: medication, reconciliation, discrepancies, adverse events, older adults

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Appendices

A Medication Management Intervention Across Care Transitions

Advances in health care and diverse treatments for chronic disease management have become the norm for many older adults living with multiple comorbidities. With these improvements in health care, however, the growing number of medications on the market to treat chronic disease and complex health problems continues to grow exponentially. For the older population, managing medications for any number of chronic diseases has become a difficult and potentially daunting task, made especially challenging when appropriate care and treatment includes hospitalization, skilled nursing, rehabilitation, and other settings needed for healing (Parry, Coleman, Smith, Frank, & Kramer, 2003).

Across transitions of care, as from hospital to home, appropriate medication management is vitally important to successful discharge planning and supportive transitional care (Hubbard & McNeill, 2012). According to Corbett, Setter, Daratha, Neumiller, & Wood (2010), medication discrepancies through care transitions continue to be one of the leading reasons for increased medication errors, adverse events, and increased readmissions in the older population, adding to overall increased health care costs in the United States. As well, "…patient safety research demonstrates that the cumulative effect of mistakes that occur during care transitions can result in significant patient harm or even death" (Hughes & Clancy, 2007).

The Institute for Healthcare Improvement's Triple Aim Initiative (2013), namely, "improving the patient experience of care (including quality and satisfaction), improving the health of populations, and reducing the per capita cost of health care", supports the need for significant change in health care in the United States. According to the IHI (2013), "The US health care system is the most costly in the world, accounting for 17% of the gross domestic product with estimates that percentage will grow to nearly 20% by 2020". As well, "With its

high prescription prices, the United States spends far more per capita on medicines than other developed countries. Drugs account for 10 percent of the country's $2.7 trillion annual health bill" (Rosenthal, 2013).

Better medication management across care transitions is essential as one facet of improvement to overall population health and decreased health care costs for the older population. Health care teams with a focus on patient-centered care, actively including the patient (and family/caregiver) as a member of the team, can have a positive effect on safe transitions of care. Nurses have a pivotal role in medication management and decreased medication discrepancies, which is affected by successful discharge planning, timely and concise communication with each transition of care, post-discharge home medication reconciliation, and supportive education for patients and families,. This can have a clear impact on improved quality of life for the older population struggling to manage multiple chronic diseases and medications.

A Review of the Literature

A search of the literature related to the topic of medication management and care transitions with the older population was done using the following databases and reference sites: CINAHL, PubMed, National Guideline Clearinghouse, Institute for Healthcare Improvement, Robert Wood Johnson Foundation, National Quality Measures Clearinghouse, and Nursing Journals @ Ovid (OvidSP). Keywords used in this search included care transitions, medication management, medication reconciliation, older adults, care coordination, post-discharge, elder population, care transitions, chronic care and medications, care across the continuum, transitions in older adult care, and community health and medications.

Thirty-six articles were retrieved from this search. Inclusion criteria consisted of

research, guidelines, and articles published within the last ten years, utilization of multidisciplinary health care teams for medication management, and evidence-based nursing practice. Exclusion criteria were predicated on research, guidelines and articles that were specifically physician- or pharmacist-based programs for medication management across transitions of care. The 36 articles included five descriptive studies, one cross-sectional study, two literature reviews, two retrospective non-experimental studies, six clinical practice guidelines, three qualitative survey design studies, four systematic reviews, seven expert opinion/case studies, and six organizational quality improvement studies. Of the 36 articles, 14 were chosen as most representative of the potential for different community-based interventions specific to nurse-driven medication management initiatives across care transitions.

Results and Discussion

The 14 selected articles included five descriptive studies, two retrospective non-experimental studies, three systematic reviews/clinical practice guidelines, and four expert opinion/commentary articles. Participants across the studies included adults ages 65 and over, transitioned between the hospital setting, assisted living, skilled nursing facilities, and back to home with or without community resources. The studies also included active participation of physicians, advanced practice nurses, inpatient and outpatient staff nurses, home health nurses, pharmacists, and family/caregivers.

Medication management interventions across care transitions were varied throughout these studies and articles. Barnsteiner's (2005) systematic review of nine studies of medication reconciliation spanned ambulatory family practice, cardiology practice and internal medicine practice, an outpatient geriatric center, inpatient acute care, ICU, and medical units at a number of different hospitals. The scope of identified problems included incomplete documentation of

prescribed medications or incomplete orders, no documentation of medications that patients were taking, which was especially prevalent when a number of providers were involved in care, patient non-adherence of prescribed medications, and patients taking incorrect dosages of prescribed medications. Increased reporting of medication discrepancies led to a number of quality improvement measures from the studies, with resultant improved medication reconciliation and medication teaching at transitions of care (Barnsteiner, 2005). Based on the JHNEBP Non-Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 4, and quality of evidence is A.

Barnsteiner (2008) expanded on the above systematic review with the inclusion of another 23 research studies reviewed for a chapter on medication reconciliation in the Agency for Healthcare Research and Quality's *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. This review of the research and evidence culminated in a number of identified clinical practice and research implications that can be effective measures in quality improvement of medication discrepancies and errors, leading to safer transition of care across the continuum. According to the JHNEBP Non-Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 4, and quality of evidence is A.

Coleman, Smith, Raha, and Min's (2005) descriptive study evaluated medication assessments performed by advanced practice nurses in the older adult's home or at a skilled nursing facility using the Medication Discrepancy Tool (Smith, Coleman, & Min, 2004) previously developed. The sample included 375 community-dwelling older adults from a large managed care delivery system in Denver, Colorado. The purpose of this study was to review the assessments to determine the number of post-discharge medication discrepancies as well as potential contributing factors. The authors were also able to discern between patient-associated

factors and system-associated factors as causes for the discrepancies. While the specific tool used in this study is a copyrighted tool, opportunities for improving nurse-driven medication teaching and assessing patient understanding of the teaching across transitions of care were identified. Based on the JHNEBP Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 3, and quality of evidence is B, although findings were noted to be substantially higher in this study as compared to similar research.

Corbett, Setter, Daratha, Neumiller, and Wood (2010) incorporated the use of two trained nurses and a pharmacist to assess and resolve medication discrepancies. The sample included 201 individuals; 101 of these were assigned to the intervention group, which was the focus of this sub-sample study of a larger randomized clinical trial completed at two hospitals located in the Inland Northwest. With this descriptive study, the two nurses employed the use of the Medication Discrepancy Tool (Smith, Coleman, & Min, 2004) to identify and resolve discrepancies, and a pharmacist followed up 10 days post-discharge and a month after discharge to evaluate and ascertain resolution to the discrepancies. As with the previous study, a copyrighted tool was used for identifying medication discrepancies. However, again the important lessons learned from this study included the recommended need for clear, focused medication teaching for both the older adults and family members or caregivers involved with care, and assessment of the patient and family's ability to understand and verbalize the teaching. According to the JHNEBP Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 3, descriptive analysis, and quality of evidence is B, as findings were noted to be consistent with similar research.

Costa, Poe and Lee (2011) utilized a non-experimental descriptive pilot study to test two proposed nursing interventions for post-hospital medication management, specifically telephone

follow up and a home visit to include nurse-initiated coaching. Of the 72 patients screened to take part in the pilot study, 32 agreed to participate and were enrolled during hospitalization. The participants ranged in ages from 22 to 88, were on four or more prescription medications, were determined to be cognitively intact, English speaking, and were discharged to home. The authors reported that the majority of medication discrepancies were identified at the time of the home visit, and included medication omission, confusion with medication instructions, and incomplete, inaccurate, or illegible discharge instructions. The authors described that the use of the nurses as coaches during the time of the home visit incorporated tailored patient education and interventions to support understanding of medications and better self-management. Although a small study, the authors felt that support for post-discharge nurse-led interventions and one-on-one teaching may facilitate better medication self-management and alleviate medication discrepancies. Based on the JHNEBP Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence for this non-experimental, descriptive study is level 3, and quality of evidence is B, as findings were noted to be consistent with similar research.

DeVeau's (2011) expert opinion paper discussed the challenges in managing health care of populations across transitions, including the fragmented processes that add to increased confusion and potential errors for patients, families, and the health care team involved. In this article, DeVeau (2011) stated "…participating healthcare providers have a high level of interest in ensuring that patients have a solid single plan of care for transition and agree that medication reconciliation is the greatest challenge". DeVeau (2011) suggested review and integration of a number of care transition models that have proven success for support and follow up with patients from hospital to home, increasing the chances of effective transitions in care and

medication self-management. Based on the JHNEBP Non-Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 5, and quality of evidence is B.

Ellenbecker, Frazier, and Verney (2004) utilized a non-experimental, descriptive study to collect self-reported data from home health nurses about their experiences and observations of clients' home medication management. One hundred one nurses responded, reporting on 1467 clients. The data showed that 78% of the patients were taking five or more medications, and that 21% of patients reported to the home health nurses a lack of understanding about how to take their medications after discharge from the hospital. This study supported the need for additional research about the different causative factors associated with medication errors post-discharge and in the home care environment, and expansion of efforts to focus on improved interventions, including medication teaching for patients, to support better medication self-management. According to the JHNEBP Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence for this non-experimental, descriptive study is level 3, and quality of evidence is B, as findings were noted to be consistent with similar research.

Fitzgibbon, Lorenz, and Lach, (2013) utilized a retrospective chart review study to determine the type and frequency of medication discrepancies with transition from hospital to assisted living. The review was done on 80 residents' records, and at least one medication discrepancy was identified in each of 69 of the records reviewed. This was a small study and the authors noted lack of generalizability. However, findings did support the need for improved medication reconciliation with every transition of care. The authors concluded that medication reconciliation is within the scope of nursing practice, diminishes medication errors, and supports safe transitions from hospital to post-acute care. Based on the JHNEBP Research Evidence

Appraisal (American Nurses Association, 2014), the strength of evidence for the retrospective non-experimental study is level 3, and quality of evidence is B, as findings were noted to be generally consistent with similar research.

A retrospective study by Foust, Naylor, Bixby and Ratcliffe (2012) was undertaken to identify the types of medication reconciliation problems and the prevalence of issues among older adults with heart failure who were discharged from hospital to home. The authors reviewed 198 hospital discharge records and patient discharge instructions, which were representative of 162 patients. Recommendations from this retrospective study indicated consideration for patient discharge instructions and hospital discharge records to be reconciled prior to patient discharge, and for additional focus on providing clear, concise patient teaching about medications and instructions at the time of discharge teaching. In addition, the authors indicated the importance of utilizing the home health nurse for additional post-discharge support and teaching, as well as medication reconciliation in the home environment. Based on the JHNEBP Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence for the large study is level 1, randomized controlled trial; this secondary retrospective non-experimental study is level 3. Quality of evidence is B, as findings were noted to be consistent with similar research.

Henriques, Costa, and Cabrita (2012) focused their descriptive qualitative study on data collected with two focus groups of older adults managing chronic disease and multiple medications and living at home. The focus groups consisted of nine adults each, with a mix of men and women in each group. Questions and discussion centered around four categories: living with medications, taking medications, beliefs about medicines, and relationship with health professionals. All four categories had a number of sub-categories relevant to each: benefits of

medications, accepting life with medications and the daily routine of medication-taking as part of maintaining better health, control of chronic illness and quality of life, level of belief and motivation to take needed medication, and trust and relationship with physicians and nurses. The authors noted the relevance of the participants' recognition of the holistic nature of nursing support for health maintenance and medication adherence. Although a small study, the authors concluded that nursing's collaborative support of patient education, teaching and training were essential to patients' abilities to self-manage disease and medication. According to the JHNEBP Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence for this descriptive study is level 3, and quality of evidence is B, as findings were noted to be consistent with similar research.

In their health policy issue brief, Hubbard and McNeill (2012) reviewed the problems surrounding hospital readmissions, especially as they are related to medication discrepancies and medication-related adverse events. As noted, "…aggregate cost of hospital admissions related to medication adherence has been estimated to be roughly $100 billion per year and estimates of the share of hospital admissions related to non-adherence are as high as 10 percent" (Hubbard & McNeill, 2012). The authors point out that many of these readmissions are preventable, and potentially are a result of fragmentation of care and lack of a coordinated system for care transitions. Solutions for implementation of a care transition program and successful outcomes are described, as well as potential barriers to change. The authors conclude that medication management and care transitions, while still fragmented throughout the health care system, can be improved and greatly enhanced by innovative change, including comprehensive medication reconciliation with every transition in care (Hubbard & McNeill, 2012). Based on the JHNEBP

Non-Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 5, and quality of evidence is A.

Hughes and Clancy's (2007) commentary focused on patient safety in nursing practice through improvement of care transitions. As the authors allude, health care and services have grown in complexity with the increasing number of people with multiple chronic diseases and on multiple medications. They identified three main themes from research studies on transitions of care: 1) the use of health information technology for improved communication, 2) incorporating care managers into the health care team to support and improve patient management of chronic disease and medications, and 3) utilizing tools and support to enhance patient's self-management and ongoing communication and collaboration with the health care team (Hughes & Clancy, 2007). The article outlined quality improvement strategies that were the outcomes of research, as well as some of the ongoing issues faced in pursuit of improved medication reconciliation and effective care transitions. The authors conclude that "3 key challenges remain: immediately translating evidence into everyday practice; improving all care transitions…; (and) targeting future research to advance transition quality measures and to examine the factors involved in transition inefficiencies" (Hughes & Clancy, 2007). Nursing is a vital health care partner to overcoming these challenges. Based on the JHNEBP Non-Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 5, and quality of evidence is A.

McDonald and Peterson (2008) point out the importance of medication reconciliation and improving medication management specifically in the older population with home health services. The authors described a number of studies that demonstrate medication issues and errors, including medication discrepancies, dosage issues, misuse of medications, adverse events

resulting from incorrect use of medications or drug-drug interactions, duplication of medications due to confusion with generic and brand names, and multiple providers involved with care and prescribing medications for older adults. As a result, the Visiting Nurse Associations of America Curricula for Homecare Advances in Management and Practice (VNAA CHAMP) program has been developed to translate evidence to practice. It is specifically taught for home health nurses and therapy managers, including such topics as "mastering medication assessment and reconciliation, monitoring for complications, and improving patient adherence" (McDonald & Peterson, 2008). The authors presented a success story from the Visiting Nurse Association of Boston (VNAB), describing their implementation of the CHAMP program to enhance clinical practice for home health nurses in medication reconciliation and patient self-management, which has resulted in standardized processes and assessments to support better patient home care. These types of quality improvement strategies assist in development of safer practices for health care, and better overall medication management for patients. Based on the JHNEBP Non-Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 4, and quality of evidence is A.

Setter, Corbett, and Neumiller (2012) described the role of the home health care nurse with patient care during transitions, and the importance of medication reconciliation and medication management. Based on a number of studies reviewed, the authors conclude that "One of the primary roles that a home healthcare nurse plays in providing exceptional transitional care to patients is to identify and resolve medication discrepancies as patients are 'handed-off' during transition" (Setter, Corbett, & Neumiller, 2012). As seen in the research, medication discrepancies with hospital discharge and transitions of care increase a patient's risk of readmission within 30 days of discharge. Medication reconciliation and appropriate

transitional care decreases the potential for medication discrepancies and adverse events, and improves the quality of safety of patient care through the continuum (Setter, Corbett, & Neumiller, 2012). Based on the JHNEBP Non-Research Evidence Appraisal (American Nurses Association, 2014), the strength of evidence is level 5, and quality of evidence is A.

Translating the Research to Practice

A number of themes emerged from review of the literature, including utilization of standardized processes to accomplish effective medication reconciliation with each transition of care (Coleman, Smith, Raha, & Min, 2005; Corbett, Setter, Daratha, Neumiller, & Wood, 2010; DeVeau, 2011; Hubbard & McNeill, 2012; Hughes & Clancy, 2007; McDonald & Peterson, 2008; Setter, Corbett, & Neumiller, 2012), enhanced communication between clinicians and with patients and family/caregivers (Coleman, Smith, Raha, & Min, 2005; Corbett, Setter, Daratha, Neumiller, & Wood, 2010; Ellenbecker, Frazier, & Verney, 2004; Fitzgibbon, Lorenz, & Lach, 2013; Foust, Naylor, Bixby, & Ratcliffe, 2012; Henriques, Costa, & Cabrita, 2012; Hughes & Clancy, 2007), increased use of health information technology to facilitate documentation for care transitions and medication reconciliation (Barnsteiner, 2005; Barnsteiner, 2008; Corbett, Setter, Daratha, Neumiller, & Wood, 2010; Fitzgibbon, Lorenz, & Lach, 2013; Foust, Naylor, Bixby, & Ratcliffe, 2012; Hubbard & McNeill, 2012; Hughes & Clancy, 2007), and incorporating a proven care transitions program in health systems and ambulatory practices to support better patient outcomes (Coleman, Smith, Raha, & Min, 2005; Corbett, Setter, Daratha, Neumiller, & Wood, 2010; Costa, Poe, & Lee, 2011; DeVeau, 2011; Foust, Naylor, Bixby, & Ratcliffe, 2012; Hubbard & McNeill, 2012; Hughes & Clancy, 2007; McDonald & Peterson, 2008; Setter, Corbett, & Neumiller, 2012), fewer readmissions (DeVeau, 2011; Hubbard & McNeill, 2012; McDonald & Peterson, 2008; Setter, Corbett, & Neumiller, 2012), and decreased medication errors (Barnsteiner, 2005; Costa, Poe, & Lee, 2011; DeVeau, 2011; Ellenbecker,

Frazier, & Verney, 2004; Foust, Naylor, Bixby, & Ratcliffe, 2012; McDonald & Peterson, 2008; Setter, Corbett, & Neumiller, 2012). As well, the evidence indicated support for nurse-led medication teaching, integrating ways to assess patient understanding of medications and medication self-management in transition back to the community (Barnsteiner, 2008; Coleman, Smith, Raha, & Min, 2005; Costa, Poe, & Lee, 2011; Fitzgibbon, Lorenz, & Lach, 2013; Foust, Naylor, Bixby, & Ratcliffe, 2012; Henriques, Costa, & Cabrita, 2012; Hughes & Clancy, 2007; McDonald & Peterson, 2008; Setter, Corbett, & Neumiller, 2012). All these themes coincide well with translating research recommendations to practice. Nursing's holistic approach to health care and disease management benefits the implementation of research into practice for improving transitions in care and medication reconciliation with a patient-centered approach.

Many of the quality improvement recommendations can be utilized separately and at the individual level, but with less generalizable evidence to support systems changes across larger populations and through transitions of care. Medication reconciliation and teaching, if done consistently with each transition of care, for every patient, and communicated with the patient and among the health care team, supports decreased medication discrepancies, improved patient adherence, decreased potential for adverse events, and a lower probability of rehospitalization (Barnsteiner, 2005; Coleman, Smith, Raha, & Min, 2005; Corbett, Setter, Daratha, Neumiller, & Wood, 2010; Costa, Poe, & Lee, 2011; DeVeau, 2011; Ellenbecker, Frazier, & Verney, 2004; Fitzgibbon, Lorenz, & Lach, 2013; Foust, Naylor, Bixby, & Ratcliffe, 2012; Henriques, Costa, & Cabrita, 2012; Hubbard & McNeill, 2012; Hughes & Clancy, 2007; McDonald & Peterson, 2008; Setter, Corbett, & Neumiller, 2012). Taken at the systems perspective, translating research recommendations to clinical practice should support greater success for meeting the goals of the Triple Aim (IHI, 2013) and supporting better population health management.

Theoretical Framework: Model of Change

The purpose of this project is the evaluation of a nurse-led home medication reconciliation program. This program model represents a collaboration between home health transitional care nurses and older adults for a home visit within 24 hours following discharge from a hospital or post-acute care setting. Services include home medication reconciliation and medication teaching, assessment of patient knowledge and ability to self-manage medications and health status, and care planning with support from and collaboration with the patient's health care team.

The scope of this program correlates well to Lippitt's Model of Change (White & Dudley-Brown, 2011). Utilizing the nursing process, the nurse's assessment and diagnosis is encompassed in phases 1 through 3 of Lippitt's model (Appendix C); phase 1: diagnose the problem, phase 2: assess motivation and capacity for change, and phase 3: assess change agent's motivation and resources. Working with older adults, the nurse collects and reviews appropriate patient discharge instructions and discharge medication list, reconciles with home medications, and assesses the older adult's understanding, motivation, and capacity to self-manage medications and health status.

The next two phases correspond to planning in the nursing process, phase 4: select progressive change objective, and phase 5: choose appropriate role of the change agent. In these stages, the nurse collaborates with the older adult, family and/or caregivers, and health care providers across the continuum of care to clarify and educate any needed changes for appropriate self-management of medications, health improvement, and disease management.

Phase 6: maintain change, represents implementation of the post-discharge plan of care and medication management with patient understanding and engagement. Follow up with the

primary care provider to communicate home medication reconciliation and findings, ensure post-discharge appointment is scheduled and confirm patient has transportation to the visit is completed in phase 7; terminate the helping relationship (Mitchell, 2013).

Nurses work with older adults to collaborate, review and educate about medications, and ascertain health care needs through care transitions, and Lippitt's Model of Change supports the work needed to affect positive health management changes in this population across transitions of care.

Project Description

Purpose

The Concord Regional Visiting Nurse Association (CRVNA) implemented a Home Medication Reconciliation Program model in the Concord, NH community. The selected patient cohort for the program is adults ages 65 or older who are high-risk, chronically complex with comorbid disease processes, are on multiple medications, have had a recent hospital admission, are challenging to manage due to complex disease and social factors, and may lack support systems at home. As well, the patients have an identified nurse navigator from one of the Concord Hospital Medical Group (CHMG) primary care practices or an embedded care coordinator from one of Dartmouth Hitchcock Concord (DHC) primary care practices. The prevalent disease processes seen in this population include congestive heart failure, coronary artery disease, chronic obstructive pulmonary disease, diabetes, and in many cases, depression.

The program utilizes CRVNA's transitional care nurses for home medication reconciliation, medication teaching, and assessment and identification of any barriers to self-management and supportive care needs post-discharge. The goals of this program are consistent with Institute for Healthcare Improvement's Triple Aim (2013): "improving the patient

experience of care (including quality and satisfaction), improving the health of populations; and reducing the per capita cost of health care" (Appendix C). Program evaluation has been initiated to assess interventions and measurable outcomes (Centers for Disease Control and Prevention, 2011).

The CRVNA's transitional care nurses collaborate with older adults for improved self-management of medications and chronic disease processes through teaching and education in the home setting. Interventions include a home visit within 24 hours of discharge from hospital or post-acute care setting for comprehensive medication reconciliation and medication teaching. This program also includes assessment of the patient's health literacy, review of and education about discharge instructions, assessment of readiness for change and ability to self-manage medications and health status, documentation of demonstrated teach back, and assessment for any needed resources and community services to support care and self-management. As well, the transitional care nurse communicates and collaborates with the primary care nurse navigator or embedded nurse care coordinator to ensure gaps in post-discharge care are closed, and a follow up visit with the primary care provider is scheduled.

Setting

The setting for this program is within Concord, NH and 35 surrounding communities served by CRVNA (Concord Regional Visiting Nurse Association, 2014). According to the 2012 census estimates, the population in the communities served is approximately 299,773, which is 23% of the state's population of 1,321,000 people (State of New Hampshire, 2013). CRVNA and CHMG are not-for-profit organizations, partnered under Capital Region Health Care, which also includes Concord Hospital and Riverbend Community Mental Health (Concord Hospital,

2014). Dartmouth Hitchcock Concord is part of the Dartmouth Hitchcock Medical Center health system (Dartmouth Hitchcock Medical Center, 2014).

Currently, CRVNA has five transitional care nurses; four are employed during the workweek and one from Friday through Monday. Within CHMG, there are a total of nine family practice settings and two internal medicine practices, with 84 providers, scattered throughout the Concord area and surrounding communities. There are nine nurse navigators embedded in CHMG primary care practices to date, working Monday through Friday. DHC has five family practice teams with 15 providers, and two internal medicine teams with six providers; one of the internal medicine teams of three physicians and two embedded nurse care coordinators, working Monday through Friday, has been working with CRVNA's transitional care nurses.

The focus population and key stakeholders include adults ages 65 and older living in Concord or any of the 35 surrounding communities served by CRVNA, and are patients of either CHMG or DHC. This population includes older adults who are chronically complex, with recent hospitalization or high risk of acute hospitalization, and polypharmacy. Other key stakeholders involved include family members and caregivers, CRVNA transitional care nurses, CHMG primary care nurse navigators, CHMG primary care providers, CHMG staff nurses, three DHC internal medicine physicians, two DHC embedded nurse care coordinators, CRVNA administrative/marketing staff, CRVNA IT/data analyst, and leadership from the three organizations.

Sample

The sample was from a population of approximately 360 older adults collaborating with nurse navigators in any of the CHMG primary care practices, and approximately 25 patients collaborating with an embedded nurse care coordinator in one of the DHC internal medicine

teams. For the identified sample, the Home Medication Reconciliation Program was provided in addition to current usual care transitions management. Patients in the identified sample may or may not have had need for skilled nursing in the home after discharge. However, this program has been implemented in support of current research and literature that shows accurate medication reconciliation and better knowledge of medication self-management decreases readmission to the hospital and promotes higher quality of care (Barnsteiner, 2008; Corbett, Setter, Daratha, Neumiller, & Wood, 2010; Costa, Poe, & Lee, 2011).

The CRVNA Home Medication Reconciliation Program was originally piloted with DHC in 2012 as a focused trial for home medication reconciliation with a small, identified population; this was staffed with one CRVNA transitional care nurse. In early 2014, CRVNA formally initiated the Home Medication Reconciliation Program with program development, training and orientation of four additional transitional care nurses. In April 2014, CRVNA began active marketing and outreach of the program to the CHMG primary care practices in Concord, NH and surrounding communities within the CRVNA service area. The program has not expanded beyond the one internal medicine team at DHC. Actual sample size varied for this program dependent on patients from the sample being admitted and discharged from the hospital, or discharged from post-acute care settings.

Protection of Human Subjects

This capstone project did not include any identifiable data for individual persons; data are based on the population, and process and outcome measures reported across the aggregate population. There was minimal risk to human subjects as individual patient data was not collected for this project; as such, internal review board (IRB) approval was not required. Reported data was retrieved from the CRVNA electronic medical record data points, and did not

reflect any patient identifiers. Population health data indicators and outcomes are available for public review.

This program is currently self-funded through the CRVNA, so the home medication reconciliation and post-discharge assessment visit incurs no cost to older adults. Therefore, financial and/or insurance status does not affect ability to receive this service. However, it is a voluntary program and individuals can decline this service at any time after initial need is identified.

Implementation Plan

The Guided Care Nursing program (The Institute for Johns Hopkins Nursing, 2014) provides a model that supports translating evidence into practice across care transitions. The basis of this model is supportive whole-person care of chronically ill older adults across all transitions in care. "Guided Care is evidence-based, comprehensive, coordinated, proactive, longitudinal, patient-centered health care for patients with multiple chronic conditions" (The Institute for Johns Hopkins Nursing, 2014).

Using the foundation of Guided Care, nurses working in primary care practices establish relationships with patients whom they will work with long-term. Since the concepts of this model are focused on work with the older population and the inherent challenges in chronic disease management and medication management across transitions of care, ongoing assessment and care planning are an important part of the model. The patient-nurse relationship supports patient-directed care, using tools such as motivational interviewing, teaching, and coaching to enhance quality of care and partnership with patients for self-management.

Identification of the patient population is vital, and is done in conjunction with primary care providers. Providers also play an important role in the introduction of this program as part

of patient care. As a working relationship is established, the nurse conducts an assessment of a patient's needs, goals, and preferences, and provides teaching and purposeful discussion with the patient and family or caregiver(s) for chronic disease self-management and medication management. Care is coordinated with the patient's health care team to promote quality of care and reduce any potential gaps in care. The nurse works collaboratively with others in the health care system and community resources to facilitate smooth transitions in care for these patients (The Institute for Johns Hopkins Nursing, 2014).

This model represents many of the factors needed to support communication and collaboration across the continuum of care, resulting in better transitions of care. Medication reconciliation is completed with every transition in care, and corrective measures for medication discrepancies are communicated and addressed as soon as acknowledged. Proactive teaching and education about medications as well as ongoing discussion and support about chronic disease management is part of the nurse's role in working with older adults. As well, collaboration with health care teams through a patient's transition to the hospital setting, skilled nursing facility, rehabilitation, and other settings supports continuity of care and increased quality of care. The nurse is a valuable resource for care planning and coordination of care through transitions, with knowledge of the patient, his/her goals and preferences, and contact with other health care providers participating in care of the patient. CRVNA has used components of Guided Care in the transitional care nurses' orientation and training, CHMG nurse navigators have completed Guided Care training, and DHC's embedded care coordinators have not utilized this training to date.

Factors that facilitated implementation included a patient-centered model with nurses focused on whole-person care and support through transitions of care. Provider engagement in

the program was also a facilitator, as patients were more willing to participate in the program if their health care provider encouraged it. Since nurses were involved in support of chronically ill patients who were most probably managing a number of medications, improved patient adherence and decreased medication discrepancies were also positive drivers to implementation of the program.

Factors considered constraints or barriers to implementation of the program included patients' level of willingness or refusal to participate in the program, patient and/or family inability to comprehend medication teaching to support appropriate self-management, financial barriers to obtaining medications, and intentional or non-intentional non-adherence to medication regimen. Other limitations included illegible or confusing medication lists and discharge instructions, lack of clear communication with the prescribing provider, and challenges working collaboratively with those on the health care team who may prefer not to work as a team.

Health Equity and Social Justice Implications

Implementing a program as outlined above, while focused on care transitions and medication management of chronically ill older adults, can also translate to the same level of care for all, regardless of age and health status. In order to support health equity and social justice, all people should be entitled to coordination of health care such that there is focus on health promotion and disease prevention proactively, rather than disease management and end of life care reactively. Meeting patients where they are at, working with patients as partners in health care and disease management, and facilitating ongoing education and collaboration is part of the privilege of being a nurse. Nursing as a profession is uniquely positioned to implement and manage programs supporting holistic care that is patient-centered, evidence-based, proactive and collaborative.

Many factors affect the ability to implement and sustain health care programs as outlined above; financial costs probably have the greatest effect on implementation. However, to improve the health of individuals, families, communities, and the larger population, there needs to be more focus and energy on proactive health management across all ages of people. Improved medication management and transitions of care, as seen in a number of the studies and articles, can have a direct effect on overall costs of care for the patient, community, health care system, and greater population. Reducing medication discrepancies and potential readmissions to hospitals can have a significant effect on the costs of health care. For some patients, medication reconciliation and tighter medication management can interpret into a substantial cost savings in unnecessary prescriptions and unwarranted hospitalizations. Additionally, improved medication management and transitions of care lead to higher quality of care and better overall patient experience, all of which help to meet the goals of the Triple Aim (IHI, 2013).

Method of Evaluation

Data Collection and Analysis

Data collection by the CRVNA transitional care nurses included utilization of discharge instructions and medication lists from the hospital or other post-acute care setting, with assessment and completion of a full medication reconciliation with every transition of care. Measurable data points included: home medication reconciliation completed; assessment of health literacy and teach back completed; discharge instructions and medication list available, legible, and easy to understand; barriers to care including financial issues identified; any needed community resources or services were in place; and follow up with a primary care provider was scheduled.

When a patient was admitted to Concord Hospital, the CRVNA's hospital liaison identified whether the patient had a CHMG nurse navigator or DHC embedded care coordinator, and if the patient met criteria for the Home Medication Reconciliation Program as stated previously. For patients admitted to other post-acute care facilities, such as skilled nursing facilities or inpatient rehabilitation, the CRVNA community liaison used the same process to identify patients who would benefit from the Home Medication Reconciliation Program per the program criteria. The liaison met the patient prior to discharge to discuss the program and offer the home medication reconciliation visit, regardless of whether the patient had a referral for skilled home care nursing after discharge. If the patient agreed, a transitional care nurse was then scheduled for a home visit within 24 hours after discharge for comprehensive medication reconciliation and medication teaching.

Once at the patient's home, the transitional care nurse reconciled the discharge medication list with the actual medications in the home. The nurse reviewed the medication list with the patient, and assessed the patient's understanding of what each medication is for and how to take it. For any potential identified knowledge deficits, the nurse completed medication teaching and again assessed for patient understanding using teach back (Appendix D), which incorporated patient's verbalization of what each medication was for and associated dosing instructions in the patient's own words. As well, the nurse completed assessment of the patient's health literacy, reviewed and educated about the patient's discharge instructions, assessed the patient's readiness for change and ability to self-manage medications, and assessed for any needed resources and community services to support the patient's home care and self-management.

The transitional care nurse confirmed that a follow up visit with the primary care provider

was scheduled, as noted on the discharge instructions, and ensured any potential gaps in care were addressed. For any issues needing immediate attention, the transitional care nurse called the patient's primary care practice to discuss with the nurse navigator or embedded care coordinator and resolved the issue. If there were no identified issues, the transitional care nurse completed the home visit and documented in the CRVNA electronic medical record. Documentation was then sent electronically to the nurse navigator if the patient had a CHMG primary care provider, or to the DHC embedded care coordinator if the identified primary care provider was part of the participating internal medicine team. This information then became part of the patient's health record with his/her primary care provider.

The data points were linked with patient-level, provider-level, or system-level categories to identify issues at any of these three levels. Patient-level issues included intentional non-adherence, unintentional non-adherence, lack of knowledge of or reason for prescribed medications, sight or dexterity limitations or cognitive impairment, adverse drug reactions or side effects, and financial barriers precluding ability to self-manage medications and health status. Provider-level issues included illegible or confusing discharge instructions or medication instructions, prescribing medications that are considered inappropriate for older adults, number of medications prescribed, and duplicate medication orders with differing dosing instructions. System-level issues included incomplete discharge instructions or medication list, conflicting information from different providers across the system (i.e. primary care, cardiologist, and orthopedic surgeon) or different informational sources, or lack of appropriate services in place for return to the community. These issues were identified and data were collected by the transitional care nurse and the nurse navigator or embedded care coordinator, in collaboration with patients' primary care providers and other health care team members involved in care.

Interpretation and results of specific patient-level, provider-level, and system-level issues were reported by category (patients, providers, and system), with breakdown of total numbers per specific issues noted in each category. These were measured from reportable data points in CRVNA's electronic medical record, tracked by CRVNA's IT/data analyst, and included in a spreadsheet report, with trending by category/issue from month to month.

Process measures included patients' increased understanding of medications and related disease processes as determined by completed assessments for health literacy, completed medication teaching and health education, demonstrated teach back documented, and patients' self-reported ability to manage diseases. Again, these data points were measured within the CRVNA electronic medical record, and tracked by the IT/data analyst to include in the monthly spreadsheet report.

Outcome measures included reduced medication discrepancies across transitions of care as determined by home medication reconciliation and teaching, decreased hospital readmission rates across the specified population, and improved ability of patients to understand and self-manage multiple medications as documented in the electronic medical record. The outcome measures were tracked through comparative data from CRVNA, CHMG primary care practices, and DHC internal medicine team for the overall identified sample population.

Data analytics collected from CRVNA's program year one specific to problems associated with medication reconciliation identified in patient home included: number of patients taking incorrect dosage(s); financial barriers; intentional non-adherence; non-intentional non-adherence; sight/dexterity/cognitive problems; difficulty keeping up with managing multiple medications; those who did not fill new prescription(s); use of outdated or inaccurate medication list resulting in medication errors; and not taking prescribed medications due to prior adverse

reaction and/or side effects (Appendix F). System level issues included: medications prescribed by providers other than the primary care provider and not on the primary care provider's medication list for the patient and/or not on the hospital discharge medication list; conflicting information from different informational sources; discharge instructions that were incomplete/inaccurate/illegible; prescription bottle label did not match prescriber's instructions; duplicate medication orders (brand name and generic); incorrect dosage (dosage on prescription bottle did not match prescribed dose); confusion between generic and brand names (brand name on medication list and generic name on prescription bottle); cognitive impairment not recognized; and no caregiver/need for assistance not recognized. The total number of actual and/or potential medication errors identified in the patient home was 161, and the total number of system level issues causing actual or potential medication errors was 182. This data was measured from 204 patients served in the program from 2012 to 2013, and included the number of patients who refused (48), number of patient visits (214), and telephone calls (60) associated with the program during its first year (Appendix F).

Data about potential resolution to identified issues were collected to identify measures used to correct or resolve the issue at hand. Examples included: number of medications reconciled with primary care provider; electronic medical record review; additional medication education; follow up visit with primary care provider; referral for social work and/or other community resources to assist with financial constraints to obtaining medications; mediplanner set up; number of medication adjustments; and problems resolved with pharmacy within 24 hours (Appendix F). The transitional care nurse requested a skilled home nursing care referral if care needs are determined to be beyond patient's ability to self-manage. For systems issues, communication and collaboration was also provided to care management leadership in the

hospital, or nursing leadership at the individual post-acute care facilities to promote ongoing improvement in the discharge process and with transitions of care.

Plan

Timeframe

The timeframe for program evaluation was February 2015 and March 2015 (Appendix E). The initial transitional care nurse was hired and trained in 2012, specifically to pilot this program with DHC. The program in its current state includes five transitional care nurses; the additional four nurses completed training and orientation in late March 2014. Marketing and outreach to all the CHMG primary care practices began in March 2014 and was completed in May 2014; program implementation has been under way since April 2014 (Appendix E).

Budget

This is an organizationally supported and funded initiative through CRVNA, and costs have been budgeted for the upcoming year. As stated previously, presently there are no incurred costs to patients.

Estimated annual budget for the Home Medication Reconciliation Program model is as follows:

DNP student project (starting spring 2015 for three-month project)	Time donated
Five full-time transitional care nurses; annual salary and benefits	$358,800.00
Data analyst at $45/hr. x 3 hrs./mo.	$1,620.00
CRVNA admin and marketing staff support at $20/hr. x 3 hr./wk.	$3,120.00
Laptops, cell phones and miscellaneous supplies for five nurses	$3,000.00
Total annual budget	$366,540.00

Evaluation

Data analysis of process and outcomes measures for the specified population for this project was done as a time series, from February 2015 and March 2015. Initially, review of baseline data measures from the identified cohort was completed with regard to medication reconciliation, medication discrepancies and/or errors, patient-reported medication adherence, and reported readmission rates as collected in CRVNA's electronic medical record nursing assessment data points. Additional communication with CHMG nurse navigators and DHC embedded nurse care coordinators, and data collection from electronic medical records was done to complete the data for the population (Appendix G).

Evaluation for the identified cohort included documented changes in rates of assessments for post-discharge home medication reconciliation and teaching (see initial data points, Appendix F), use and documentation of teach back method to support patient comprehension and potential for medication adherence (Appendix D), number of identified medication discrepancies (Appendix F), and number of readmissions. Lastly, evaluation of data was completed and will be presented for report to each organization's leadership team, primary care practice providers, and nurse navigators and embedded nurse care coordinators to communicate the process and outcomes measures and trending, and any potential recommendations for practice change to improve medication reconciliation and teaching across transitions of care.

Results, Findings, and Interpretation

Data were collected, reviewed, and analyzed from CRVNA, as well as CHMG and DHC electronic medical records. The data were initially separated out by organization for each month, and included total number of patients referred to the program, total patients refusing/declining service, patient age (mean), number of current medications (mean), number of current diagnoses

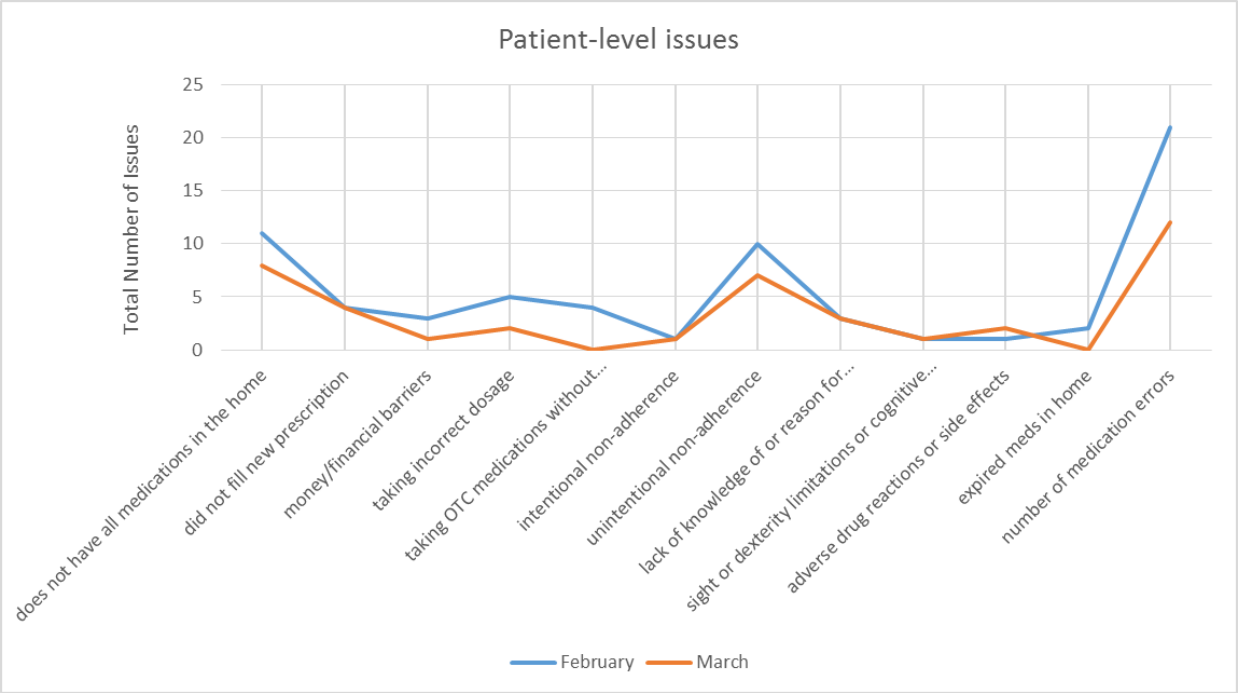
(mean), as well as patient-level, provider-level, and system-level identified issues, total number of emergency department visits and/or readmissions to the hospital, nursing interventions, and identified process and outcomes measures. Data for each organization were combined per month to reflect the total number of patients served and breakdown of the above data points (Appendix G).

Total patients referred for a nurse-led home medication reconciliation visit were 33 in February and 35 in March; number of patients receiving this service was 30 in February and 31 in March. Three patients refused this service in February, and four refused in March. The mean age of patients in the February data set was 75, while the mean age for the population in March was 79. Interestingly, the number of current medications for the population in February was 16 (mean) with a range of 3 to 27 current medications, and 17 (mean) with a range of 4 to 29 current medications in March; the number of current diagnoses in February was 19 (mean) with a range of 9 to 29 current active diagnoses, and 18 (mean) with a range of 3 to 37 current active diagnoses in March (Appendix G). These data points were similar for each month, which was expected with the specified criteria for the cohort included in the program. The data were considered significant when reviewing patient-level issues, including knowledge of and adherence to medication regimens.

Patient-level issues exhibited similar trends across February and March on the same data points. Namely, the top three identified patient-level issues included number of medication errors (medications not on the discharge medication list or duplicate medications listed) with totals of 21 in February and 12 in March; number of patients who did not have all medications in the home, for totals of 11 in February and 8 in March; and unintentional non-adherence (did not understand how to take medication correctly or was not given the correct dosing instructions) to

prescribed medications, with totals of 10 in February and 7 in March (see Table 1). The number of patients noted to be taking incorrect dosage(s) was also pertinent, with five noted in February and two noted in March. The total number of actual or potential patient-level issues identified was 66 for the month of February, and 41 for the month of March (Appendix G).

Table 1. Patient-level issues, February and March trends

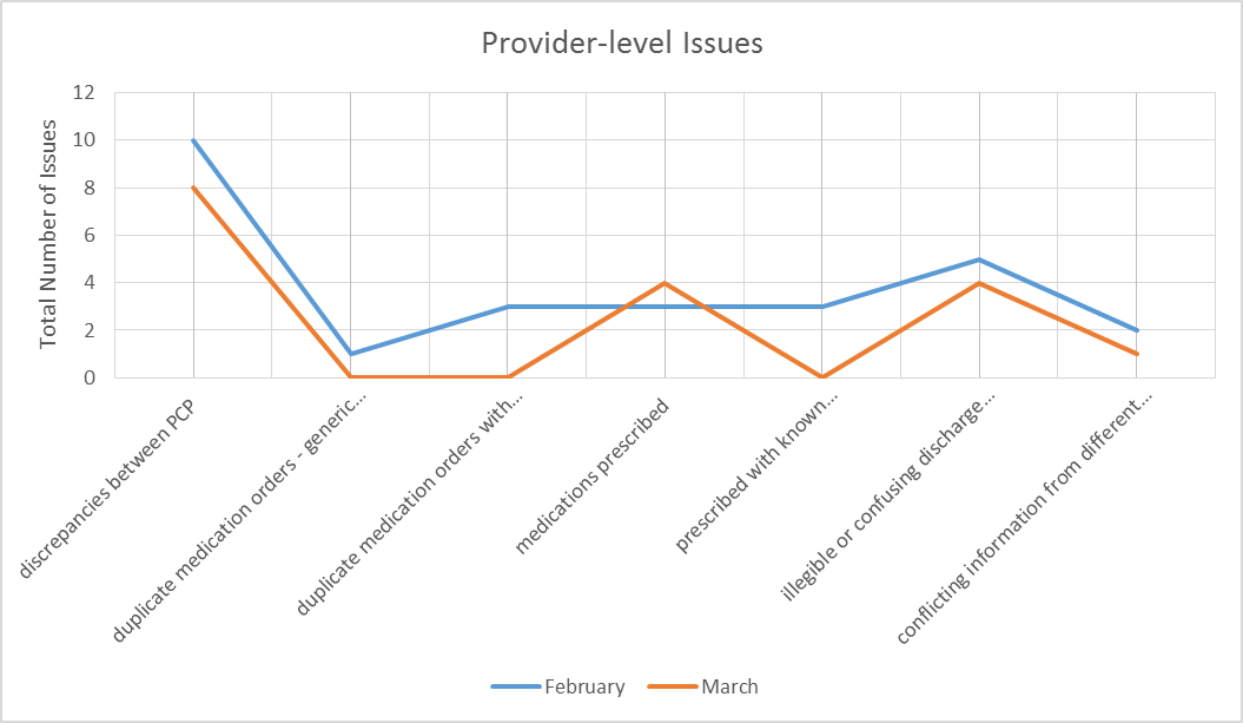


Note: Reference source data as documented in Appendix G

A review of provider-level issues for February and March indicated the top two issues were discrepancies between the medication list at discharge and the primary care provider's medication list on record, and illegible or confusing discharge instructions or medication instructions (Table 2). In February, there were 10 discrepancies between medication lists at discharge and that of the primary care provider, and eight discrepancies noted in March. Illegible or confusing discharge instructions or medication instructions were the second highest

issue, with five noted in February, and four noted in March. These data points were considered significant and were directly correlated to the patient-level data points for medication errors, incorrect dosage(s), and unintentional non-adherence. Total provider-level issues identified in February were 27, with 19 for the month of March (Appendix G).

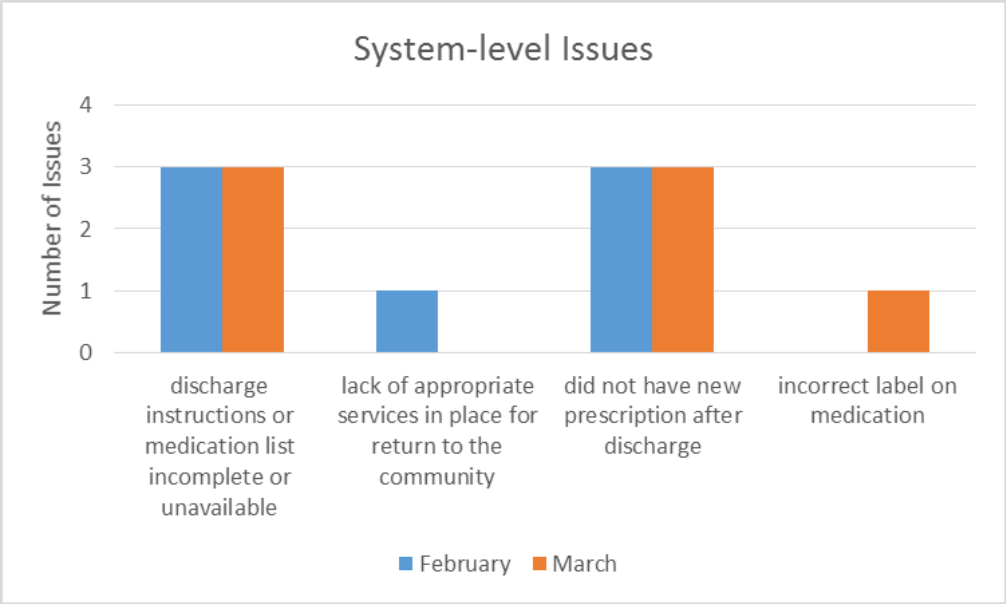
Table 2. Provider-level issues, February and March trends



Note: Reference source data as documented in Appendix G

The top two system-level issues identified trended the same for February and March; discharge instructions or medication list incomplete or unavailable, and patient did not have new prescription after discharge were noted three times each in February and March for the two data points (see Table 3). While there were few system-level issues identified, it was still pertinent to consider the potential for these issues to impact patient inability to understand and self-manage disease processes and multiple medications.

Table 3. System-level issues, February and March trends



Note: Reference source data as documented in Appendix G

Any of the patient-level, provider-level, or system-level data points (defined in Appendix H) could potentially result in increased emergency department visits and/or hospital readmissions within 30 days of the home medication reconciliation visit. According to the collected data, in February, one patient was seen in the emergency department and discharged to home; one patient was seen in the emergency department and subsequently readmitted to the hospital; and one patient was readmitted to the hospital within 24 hours of discharge. In March, two patients were seen in the emergency department, and only one patient was readmitted to the hospital (Appendix G).

A number of nursing interventions were noted during the two-month evaluation that support patient safety, improvement of patient ability to self-manage medication therapy independently or with family/caregiver support, and increased health care quality. These include home medication reconciliation completed, assessment of health literacy and teach back

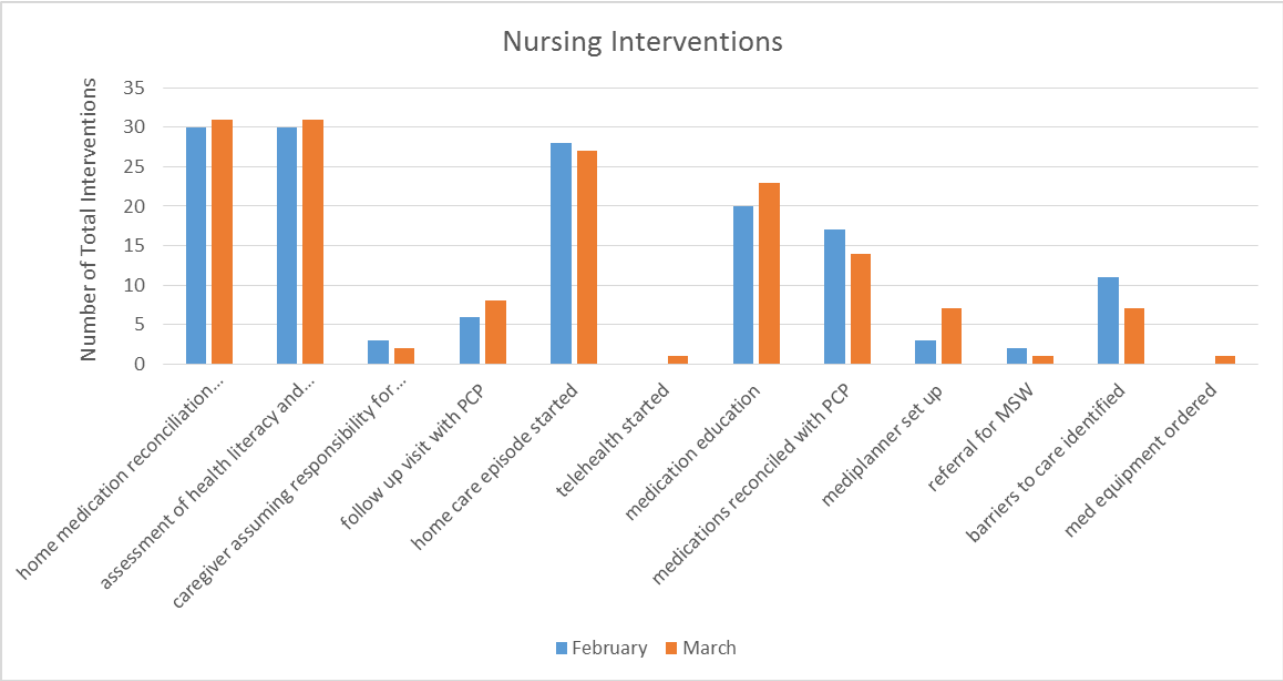
completed, medications reconciled with primary care provider, additional medication education completed, mediplanner set up initiated, barriers to care identified, and referrals for additional community resources or needed equipment completed. All of these nursing interventions support increased patient safety, ability to self-manage medications and chronic disease within the community, and improved health care quality for patients and families (Appendix G).

Goals of the CRVNA Home Medication Reconciliation Program include completed home medication reconciliation and assessment of health literacy and teach back to promote patient ability to manage his/her current medications. These interventions were completed and documented 100% of the time in both February and March (see Table 4). As well, many of the interventions noted were addressing potential gaps in transition of care from hospital or post-acute care facility to home.

The top four nursing interventions identified through the data included assessment and evaluation for home care completed; 28 of the 30 patients in February met criteria for home care, 27 of the 31 patients in March met criteria, and after coordination with the primary care provider, home care services were initiated for the identified patients. Additional medication education was completed for 20 patients in February and 23 in March; and the transitional care nurses reconciled medications with the primary care provider, nurse navigator, or embedded care coordinator for 17 patients in February and 14 patients in March. Lastly, barriers to care were identified for 11 patients in February and 7 patients in March, and methods for resolution were initiated (see Table 4). These included collaborating with resources in the community for medication financial assistance, facilitating acquisition of needed equipment that had not been identified in the care transition to home, or coordinating mediplanners with community

pharmacies to support and maintain patient safety and ability to self-manage medications. Total nursing interventions in February were noted at 150, and in March were 153 (Appendix G).

`**Table 4.** CRVNA Nursing Interventions, February and March



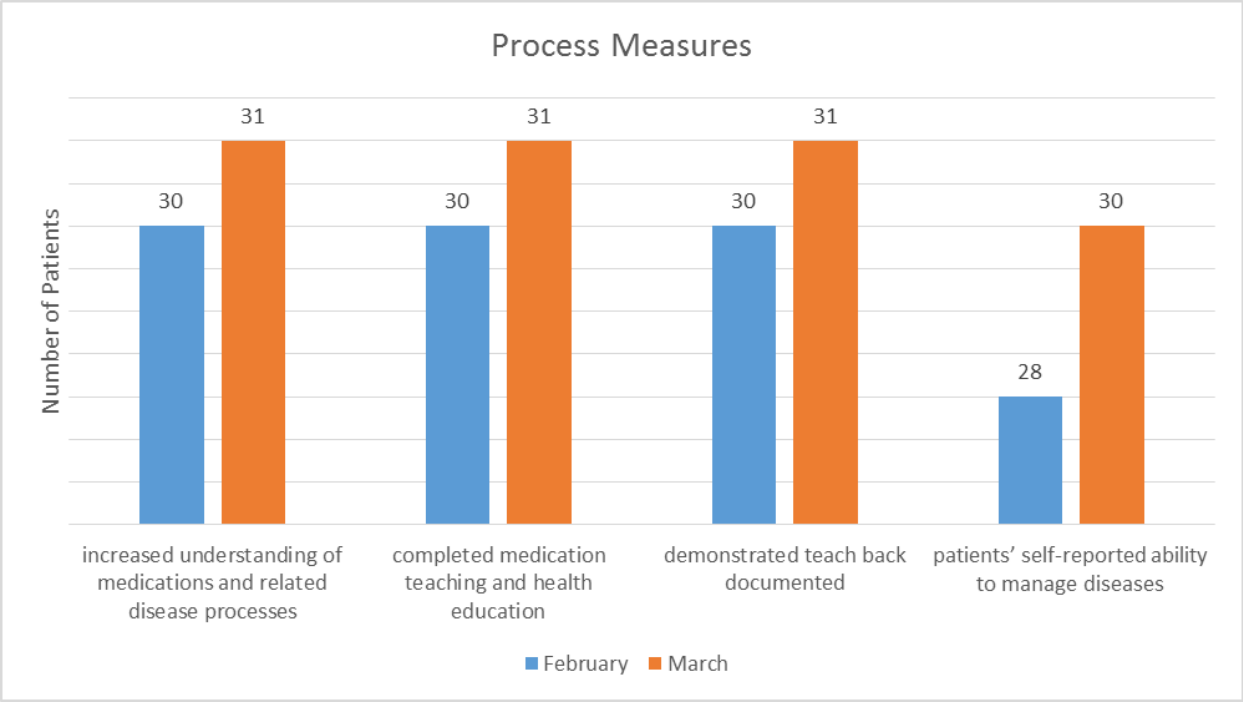
Note: Reference source data as documented in Appendix G

As patient-, provider-, and system-level issues were addressed, and nursing interventions initiated and completed, the data were reviewed for indications and documentation of process and outcomes measures as outlined previously. Of note, the process measures considered for this project included patients' increased understanding of medications and related disease processes, completed medication teaching and health education, demonstrated teach back documented, and patients' self-reported ability to manage diseases. Outcomes measures included reduced medication discrepancies across transitions of care, decreased hospital readmission rates across the specified population, and improved ability of patients to understand and self-manage multiple medications.

In February, process measures were met at 100% except for patients' self-reported ability

to manage diseases. In this data set, 28 of the 30 patients (93%) met the process measure, with two ultimately depending on family members and/or caregivers for additional support to manage multiple chronic diseases. In March, all process measures were met at 100% with the exception of patients' self-reported ability to manage diseases; 30 of 31 patients (97%) met this process measure, and one patient required additional support to manage multiple diseases (see Table 5 and Appendix G).

Table 5. Process Measures, February and March



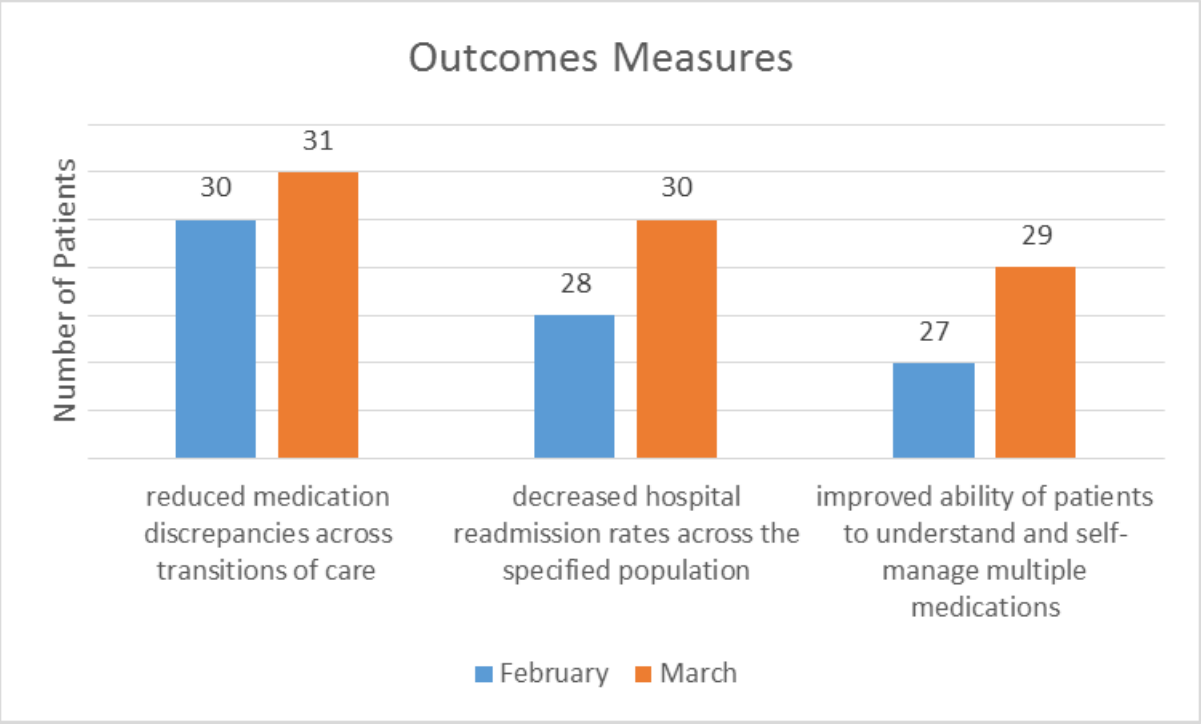
Note: Reference source data as documented in Appendix G

Outcomes measures in February and March reflected that reduced medication discrepancies across transitions of care was met at 100% (30 of 30 patients in February, and 31 of 31 patients in March), as evidenced by nursing interventions and supporting documentation in the electronic medical records that medication reconciliation had been completed, medication lists reconciled with primary care providers and others as necessary, and medication errors including incorrect medications, incorrect dosages, and medications missing from the discharge

medication list were resolved. Decreased hospital readmission rates in the selected cohort for February indicated that 28 of 30 patients did not have a hospital readmission from the time of the home medication reconciliation visit through 30 days post-discharge; this indicated 93% met the outcomes measure. In March, 30 of 31 patients did not have a hospital readmission, indicating that 97% met the outcomes measure, however, data were assessed through the project evaluation end on March 31, so it cannot be confirmed if there were readmissions within a 30-day post-discharge period that are not accounted for in March's data (see Table 6).

Lastly, 27 of 30 patients (90%) in February, and 29 of 31 patients (94%) in March met the third outcomes measure, improved ability of patients to understand and self-manage multiple medications (see Table 6). This outcomes measure was reflected through documentation of successful medication education, assessment of health literacy and teach back completed, and caregiver assuming responsibility for medications identified (Appendix G).

Table 6. Outcomes Measures, February and March



Note: Reference source data as documented in Appendix G

Discussion

The CRVNA Home Medication Reconciliation Program represents many of the factors needed to support patient-focused collaboration and communication across the continuum of care, resulting in better transitions of care for patients and their families. Medication reconciliation and medication education are completed with every transition in care, assessment of health literacy and teach back are standard processes to acknowledge and document patient understanding for appropriate self-management of medications and diseases. Medication discrepancies and/or errors are proactively identified, communicated, and addressed early, and issues are resolved before patient harm may occur.

From a public health standpoint, this program has potential beyond the specific population identified for this service presently. The program is proving that people are getting the education and support needed to better manage health and reduce unnecessary or avoidable emergency department visits and/or hospital admissions. Translated across a larger population, the program's model could serve as an exemplar to meeting the goals of the Triple Aim, improving population health, decreasing costs of health care, and improving quality and satisfaction with care (IHI, 2013).

Strengths

A strength of this program has been and continues to be the unequivocal support of the team at CRVNA at every level as it is "the right thing to do" for high quality patient care across the continuum. As health care, disease management, and medication management become more difficult and complicated for patients and their families, this program focuses on the importance of collaboration and communication across all venues, ultimately resulting in reduced medication discrepancies, improved patient adherence, decreased hospital admissions, decreased health care costs, and increased quality and satisfaction with care.

Other benefits of the program are that it is patient-centered, the transitional care nurses are focused on whole-person care, and they address any identified needs or gaps to support quality transition back to home and the community. Collaboration and coordination with CHMG nurse navigators, DHC embedded care coordinators, and health care teams and other community resources has been a strength of the program to date, and will continue to be an asset moving forward. As providers are realizing the positive outcomes with patients who receive the home medication reconciliation service, support and engagement in the program should continue to expand. This has a positive effect on patients as well, as many patients may be more willing to participate in the program if their health care provider is engaged and supports it. This program has potential for significant positive impact if expanded beyond the currently identified population.

Limitations

Identified limitations included a small number of patients who chose not to participate in the program, and as such did not benefit from the home medication reconciliation and teaching. As well, limiting factors included a few patients' identified financial barriers to obtaining medications, patients' intentional or non-intentional non-adherence to taking medications as prescribed, and sight or dexterity limitations or cognitive impairment.

Challenges identified at the provider-level and systems-level included discrepancies between the medication list at discharge and the primary care provider's medication list, confusing discharge instructions or medication instructions, discharge instructions or medication list incomplete or unavailable, and patient did not have new prescription after discharge. These issues correlated to the patient-level data points for medication errors, incorrect dosage(s), and

unintentional non-adherence, and had potential negative impact to patients' ability to understand and self-manage multiple medications after discharge.

One of the more significant limitations of the project's timeframe included the short evaluation period and the small population *n* for each of the two months. However, although the two-month evaluation and data may not be generalizable, it can be assumed from the prior data of the program that ongoing nurse-led home medication reconciliation supports successful medication management across transitions of care, increased patient knowledge and ability to self-manage, and decreased emergency department visits and/or hospital readmissions. Extrapolating this across a larger population may result in dialogue that is more open with supportive feedback and collaboration, and opportunities for continued education to health care providers and/or health care teams in reducing and eventually eliminating the gaps in medication management across care transitions.

Conclusion

Advances in health care and the growing number of medications to treat chronic disease and complex health problems have given hope to many for improved quality of life and extended life span. For the older population, however, the benefits may not necessarily outweigh the challenges imposed when appropriate care and treatment includes hospitalization and post-discharge management of multiple medications and disease processes.

The importance of complete, accurate, and timely medication reconciliation and teaching to patients cannot be underestimated. Decreasing medication errors and discrepancies with all transitions of care takes the collaborative efforts of providers, nurses, and other members of the health care team utilizing consistent, accurate medication reconciliation processes as a priority. Including patients as part of the process can lead to less errors and better outcomes; partnership

and collaboration between CRVNA, CHMG, DHC, and patients and families have proven this is possible. Implications for future practice include increased collaboration between the hospital, post-acute care facilities, outpatient practices, and within the community to expand knowledge and awareness of evidence-based practice with medication reconciliation, and utilize available technologies to support consistent and accurate medication reconciliation and teaching.

The CRVNA Home Medication Reconciliation Program is translating evidence into practice, and is making a positive impact on current issues with transitions of care and medication management. The program supports that older adults have appropriate understanding and ability for self-management of medications and chronic disease, and any needed resources are in place for successful transition back to home and the community.

Implications for Future Practice

With focus on nurse-led home medication reconciliation, medication teaching, and assessment and identification of any barriers to self-management and care needs post-discharge, this program will continue to help older adults remain as independent as possible. Expanding upon the lessons learned with this program across a larger population could potentially support better medication management across care transitions for all, contributing to improvement of population health, decreased health care costs, and improved quality and satisfaction with care (IHI, 2013).

Ongoing analysis of results and communication to leadership, providers, and health care teams is needed to support continued review and dialogue about patient-, provider-, and system-level issues associated with medication management, which is vital when considering the potential to expand the program beyond the currently identified population. Expansion of this program, and continued education for patients and health care prescribers, could have a

significant positive effect in reducing and eventually eliminating gaps in medication management across care transitions for all patients. The CRVNA Home Medication Reconciliation Program is an excellent example of the potential for improvement of patient-centered care across the population.

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Appendix A

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
Barnsteiner, J. H. (2005). Medication Reconciliation. *American Journal of Nursing*, March 2005 Supplement, 31-36.	Ambulatory practices, hospitals, outpatient geriatric center	Systematic review of nine studies of medication reconciliation			4 A
Barnsteiner, J. H. (2008). Medication reconciliation. In Hughes R. G. (ed.), *Patient safety and quality: An evidence-based handbook for nurses* (pp. 1-14). Rockville, MD: Agency for Healthcare Research and Quality.		Systematic review and clinical practice guidelines including research and implications for practice			4 A
Coleman, E., Smith, J., Raha, D., & Min, S. (2005). Posthospital medication discrepancies, prevalence and contributing factors. *JAMA Internal Medicine (formerly Archives of Internal Medicine), 165*, 1842-1847.	Sample: community-dwelling older adults, n=375. Location: large managed care delivery system in Denver, Colorado	Descriptive analysis/study of medication discrepancies	14.1% of adults in the study had 1 or more medication discrepancies, and the average number of medication discrepancies was 1.6. For those adults with medication discrepancies, the average number of medications they were taking was 9, compared to an average of 7	Strengths: study was done in a community hospital, and data was collected from multiple sources for medication reconciliation and discrepancy investigation. Limitations: subjects were recruited from one	3 B

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
			medications for those adults who did not have a medication discrepancy identified. Rehospitalization rates were much higher for those adults with identified medication discrepancies, 14.3% vs 6.1%.	community hospital/health care system; population in the study were "…predominantly white and relatively well educated, and all had prescription drug coverage" (Coleman, Smith, Raha, & Min, 2005). This may limit the generalizability of the findings of this study.	
Corbett, C. F., Setter, S. M., Daratha, K. B., Neumiller, J. J., & Wood, L. D. (2010). Nurse identified hospital to home medication discrepancies: implications for improving transitional care. *Geriatric Nursing, 31*(3), 188-196. doi:10.1016/j.gerinurse.2010.03.006	Sample: A total of 201 patients were accepted into the study; 101 of these were assigned to the intervention group, which was the focus of this sub-sample study of a larger randomized clinical trial	Descriptive analysis of the nursing role in identifying medication discrepancies	94% of the patients assigned to the intervention group had at least 1 nurse-identified medication discrepancy, with the average of 3.3 discrepancies per person. Nurses identified discrepancies across almost all medication classes, including known high-risk medications. Conclusion was that	Strengths: Utilization of Medication Discrepancy Tool (Coleman, 2005) for collection of data, including identification of causes and contributing factors, as well as indication of patient vs. system level factors. Two trained nurse	3 B

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
	Location: Two hospitals located in the Inland Northwest		Evidence based practice to improve medication reconciliation with transitions of care is needed, as well as the potential for policy change.	interventionists and one pharmacist for implementation of the research tool and data collection. Weaknesses: Only focused on hospital to home medication discrepancies; did not include transition between other settings of care	
Costa, L. L., Poe, S. S., & Lee, M. C. (2011). Challenges in posthospital care - nurses as coaches for medication management. *Journal of Nursing Care Quality, 26*(3), 243–251.	Sample: n=32	Descriptive non-experimental pilot study testing two posthospital interventions, telephone follow up and home visit	Evidence to support nurse-led post-discharge intervention with one-on-one communication increased detection of medication discrepancies and addressed knowledge deficits about self-management.	Strengths: Supported early handoff to PCP increased chance of safe care. Increased knowledge of home care needs of indigent population and understanding of high admission rates. Weaknesses: only included people discharged from	3 B

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
				one hospital in the inner city. Men were not well represented. Participants had high school education or less, and limited financial means.	
DeVeau, M. (2011). The complexity of care transitions. *Home Healthcare Nurse*, 29(10), 655-656. doi: 10.1097/NHH.0b013e3182341547		Expert commentary and opinion	Recommendations to review and incorporate a care transitions program for better facilitation of support and services needed for patients to return to home and community		5 B
Ellenbecker, C. H., Frazier, S. C., & Verney, S. (2004). Nurses' observations and experiences of problems and adverse effects of medication management in home care. Geriatric Nursing, 25(3), 164-170. doi:10.1016/j.gerinurse.2004.04.008	Convenience sample of home health nurses from twelve certified home health agencies in Connecticut, Ohio, Massachusetts, Michigan, Montana, and Wisconsin	Non-experimental descriptive study	Medication management for the older population in home care is challenging with increased medications and costs that may impact ability for adherence. Recommendations to improve technology for more accurate communication and information. Support additional research to	Strengths: Supported other similar research regarding lack or incompleteness of communication between transitions of care Weaknesses: Small response rate at 30%, lacks generalizability. Information was	3 B

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
			identify factors that contribute to medication errors for the older population managing meds in the home.	reported in aggregate, cannot conclude correlation between variables and events	
Fitzgibbon, M., Lorenz, R., & Lach, H. (2013). Medication reconciliation: reducing risk for medication misadventure during transition from hospital to assisted living. *Journal of Gerontological Nursing, 39*(12), 22-29. doi:10.3928/00989134-20130930-02	Sample: retrospective chart review of pre- and post-hospital medication profiles; n=80 residents 65 and older Location: large commercial pharmacy serving multiple assisted living facilities	Retrospective non-experimental study	Evidence-based guidelines for medication reconciliation to decrease medication errors is within scope and practice of nurses. Recommended that regulations need to change to require assisted living facilities to employ nurses to supervise and administer meds.	Strengths: Study supported the need for improved care transitions with completed medication reconciliation; supports other similar research Weaknesses: Small study, narrow geographic area, findings lack generalizability	3 B
Foust, J. B., Naylor, M. D., Bixby, M. B., & Ratcliffe, S. J. (2012). Medication problems occurring at hospital discharge among older adults with heart failure. *Research in Gerontological Nursing, 5*(1), 25-33.	Sample: retrospective chart review of medical records n=324; 126 were excluded and 198 were included,	Retrospective non-experimental study	From the review, approximately 71% of discharge summaries had at least 1 medication reconciliation problem, with a range of 0-5 medication reconciliation problems per discharge. The	Strengths: the results of this retrospective review coincide with other similar research and review studies.	3 B

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
doi:10.3928/19404921-20111206-04	representing 162 patients. Location: six hospitals in the Philadelphia, PA area.		average over the 198 hospital discharges reviewed was 1.3 problems per discharge.	Weaknesses: the discharge process and documents were different across all six hospitals. There are implications to potential inconsistency of the process in each of the sites, and it is unclear how this may have affected integrity of the represented data.	
Henriques, M. A., Costa, M. A., & Cabrita, J. (2012). Adherence and medication management by the elderly. *Journal of Clinical Nursing*, 21, 3096–3105. doi: 10.1111/j.1365-2702.2012.04144.x	Sample: Two focus groups, each consisted of nine adults aged 65 and older. Location: Lisbon's Health Centre in Lisboa, Portugal	Descriptive qualitative study	Focus group participants noted the importance of relationship with health care providers and nurses to support appropriate disease management and medication management for the elderly population.	Strengths: Questions for the focus groups were developed from theoretical framework; fairly balanced groups of men and women Weaknesses: Small number of participants in focus groups, and done as a convenience sampling	3 B

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
Hubbard, T., & McNeill, N. (2012). Thinking outside the pillbox: improving medication adherence and reducing readmissions [Issue Brief]. NEHI, The Network for Excellence in Health Innovation. Retrieved from http://www.nehi.net/writable/publication_files/file/nehi_improved_medication_adherence_and_hospital_readmissions_issue_brief.pdf.		Organizational review and expert opinion	Recommendations for improvement in care transitions, incorporating a proven care transition program with comprehensive medication reconciliation		5 A
Hughes, R. G., & Clancy, C. M. (2007). Improving the complex nature of care transitions. *Journal of Nursing Care Quality, 22*(4), 289–292.		Expert commentary and opinion			5 A
McDonald, M. V. & Peterson, L. E. (2008). Finding success in medication management. *Home Health Care Management & Practice, 20*(2), 135-140. doi: 10.1177/1084822307306630		Systematic review of multiple studies to develop clinical practice guidelines			4 A

Citation	Sample and location	Design	Outcomes/results	Strengths and weaknesses	Evidence Level | Quality
Setter, S. M., Corbett, C. F., & Neumiller, J. J. (2012). Transitional care: exploring home healthcare nurse's role in medication management. *Home Healthcare Nurse, 30*(1), 19-26.		Literature review and expert opinion			5 A

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American Nurses Association (2014). JHNEBP Research Evidence Appraisal, developed by The Johns Hopkins Hospital/The Johns Hopkins University (n.d.) Retrieved from http://www.nursingworld.org/DocumentVault/NursingPractice/Research-Toolkit/JHNEBP-Research-Evidence-Appraisal.pdf

American Nurses Association (2014). JHNEBP Non-Research Evidence Appraisal, developed by The Johns Hopkins Hospital/The Johns Hopkins University (n.d.) Retrieved from http://www.nursingworld.org/DocumentVault/NursingPractice/Research-Toolkit/JHNEBP-Non-Research-Evidence-Appraisal.pdf

Appendix B

Lippitt's Model of Change and the nursing process

Nursing process elements	Lippitt's theory
Assessment*	*Phase 1*. Diagnose the problem
	Phase 2. Assess motivation/capacity for change
	Phase 3. Assess change agent's motivation and resources
Planning†	*Phase 4*. Select progressive change objective
	Phase 5. Choose appropriate role of the change agent
Implementation‡	*Phase 6*. Maintain change
Evaluation‡	*Phase 7*. Terminate the helping relationship

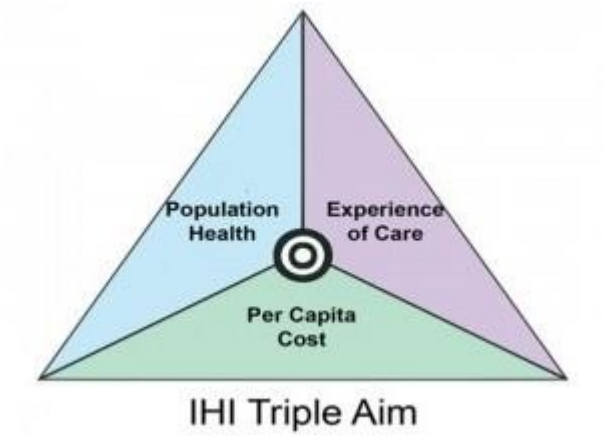
Key: * Assessment = Lewin's unfreezing stage
† Planning/implementation = Lewin's moving stage
‡ Implementation/evaluation = Lewin's refreezing stage

(Lewin 1951, Lippitt *et al* 1958, Pearson *et al* 2005)

Reference:

Mitchell, G. (2013). Selecting the best theory to implement planned change. *Nursing Management*, *20*(1), 32-37. Retrieved from http://rcnpublishing.com/doi/full/10.7748/nm2013.04.20.1.32.e1013

Appendix C



"Triple Aim":

- Improving the patient experience of care (including quality and satisfaction);
- Improving the health of populations; and
- Reducing the per capita cost of health care.

Reference:

Institute for Healthcare Improvement (2013). Retrieved from

http://www.ihi.org/Engage/Initiatives/TripleAim/Pages/default.aspx

Appendix D

10 Elements of Competence for Using Teach-back Effectively

1. Use a caring tone of voice and attitude.
2. Display comfortable body language and make eye contact.
3. Use plain language.
4. Ask the patient to explain back, using their own words.
5. Use non-shaming, open-ended questions.
6. Avoid asking questions that can be answered with a simple yes or no.
7. Emphasize that the responsibility to explain clearly is on you, the provider.
8. If the patient is not able to teach back correctly, explain again and re-check.
9. Use reader-friendly print materials to support learning.
10. Document use of and patient response to teach-back.

What is Teach-back?

- A way to make sure you—the health care provider—explained information clearly. It is not a test or quiz of patients.
- Asking a patient (or family member) to explain **in their own words** what they need to know or do, in a caring way.
- A way to check for understanding and, if needed, re-explain and check again.
- A research-based health literacy intervention that improves patient-provider communication and patient health outcomes.

Reference:

Institute for Healthcare Improvement (2013). Retrieved from http://www.ihi.org/resources/Pages/Tools/AlwaysUseTeachBack!.aspx

Appendix E

	Apr 2014	May 2014	June 2014	July 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015
Program implementation												
Initial program evaluation												
Program evaluation												

- Program implementation to all 11 CHMG primary care practices
- Evaluation of initial implementation and structure of program (led by CRVNA)
- Evaluation of program's process and outcomes measures

Appendix F

Data Analytics Year 1

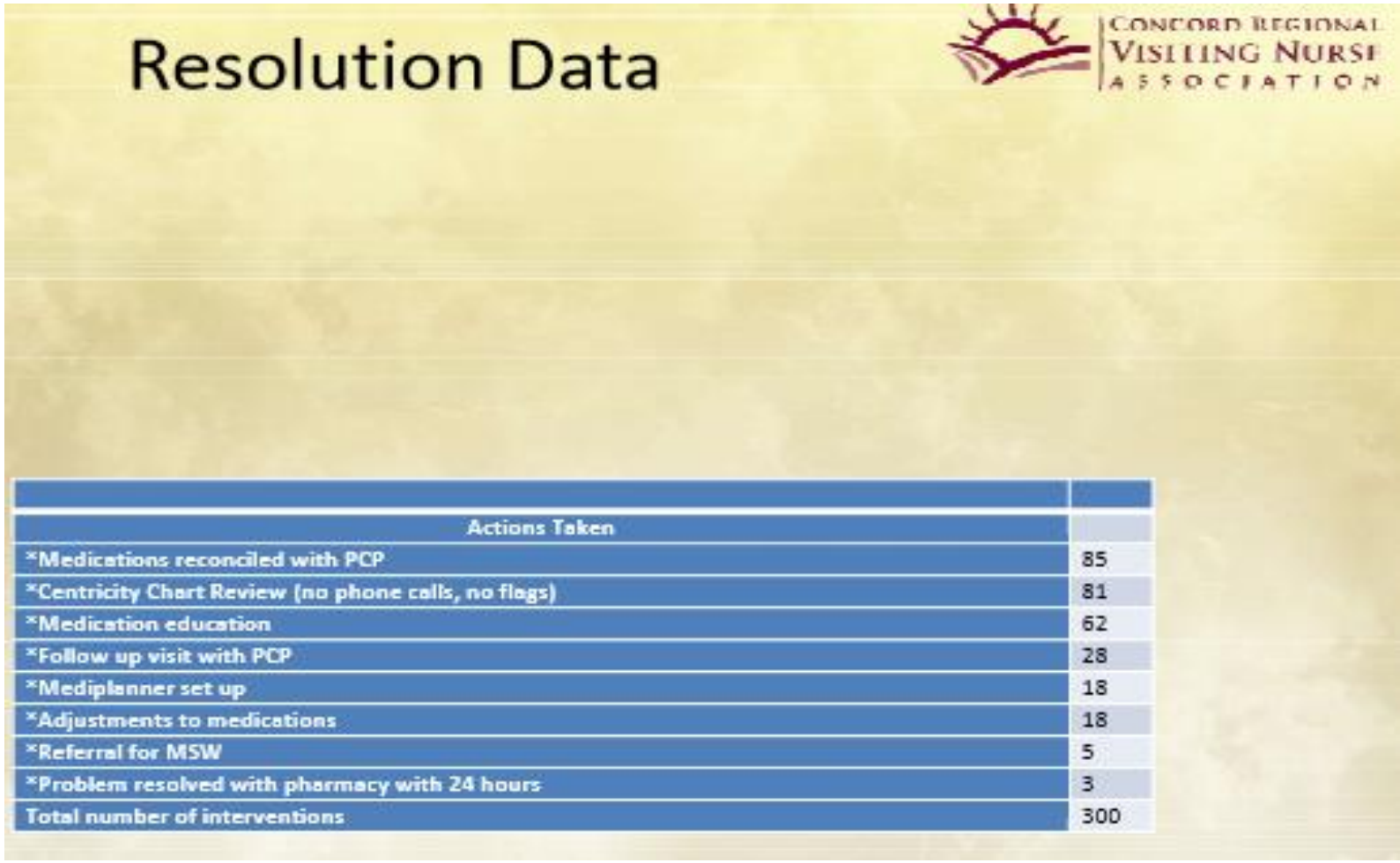
CONCORD REGIONAL VISITING NURSE ASSOCIATION

Time Period 2/6/2012 to 2/6/2013	
Problems Identified During Medication Reconciliation Process	
Patients served=204, Patients who Refused=48, Visits= 214, Telephone calls=60	
Patient Level Issues Inhibiting Accurate Medication Adherence	
*Number of patients taking incorrect dosage	27
Number of patients with financial barriers (do not have all medications/unable to afford)	27
Number of patients with intentional non-adherence "I was told to take this but I chose not to"	24
Non-intentional non-adherence "I don't understand how to take this medication"	20
*Number of patients with sight/dexterity/cognitive problems	19
*Number of patients with difficulty keeping up with multiple medications	16
Number of patients that did not fill new prescription	16
*Number of patients using outdated/inaccurate medication list resulting in med errors	9
*Number of patients not taking prescribed medication due to adverse reaction and or side effects	3
Total number of actual and/or potential medication errors identified in patient home	161

Data

CONCORD REGIONAL VISITING NURSE ASSOCIATION

System Level Issues Inhibiting Accurate Medication Adherence	
*Meds prescribed by physicians other than PCP not on PCP med list and/or hospital medication list	49
Conflicting information from different informational sources (example, DC med list & DC summary)	42
Discharge instructions incomplete/inaccurate/illegible	19
Incorrect label (label on the bottle does not match physician instructions)	19
*Duplicate medication orders (generic and brand names)	17
Incorrect dosage (dose on the bottle does not match prescribed dose)	14
Confusion between generic and brand names (brand name of med list while generic on bottle)	9
Cognitive impairment not recognized	9
No caregiver/need for assistance not recognized	4
Total number of system level issues causing actual or potential medication error	182



Actions Taken	
*Medications reconciled with PCP	85
*Centricity Chart Review (no phone calls, no flags)	81
*Medication education	62
*Follow up visit with PCP	28
*Mediplanner set up	18
*Adjustments to medications	18
*Referral for MSW	5
*Problem resolved with pharmacy with 24 hours	3
Total number of interventions	300

Reference:

Martel, D. & Sampadian, P. (2013). Care coordination model for collaboration with medical homes (PowerPoint presentation). New England Home Care & Hospice Conference, retrieved from http://www.nehcc.com/_documents/_session_handouts/Martel-and-Sampadian-Care-Coordination-Model.pdf

Appendix G

CRVNA Home Medication Reconciliation Program February-March 2015		
	February	March
Total patients referred	33	35
Total patients refusing/declining service	3	4
Patient age (mean)	75	79
Number of current medications (mean)	16	17
Number of current diagnoses (mean)	19	18
Patient-level issues*		
does not have all medications in the home	11	8
did not fill new prescription	4	4
money/financial barriers	3	1
taking incorrect dosage	5	2
taking OTC medications without informing PCP	4	0
intentional non-adherence (know medication should be taken, but chooses not to)	1	1
unintentional non-adherence	10	7
lack of knowledge of or reason for prescribed medications	3	3
sight or dexterity limitations or cognitive impairment	1	1
adverse drug reactions or side effects	1	2
expired meds in home	2	0
number of medication errors	21	12
Total actual or potential patient-level issues	**66**	**41**
Provider-level issues*		
discrepancies between PCP	10	8
duplicate medication orders - generic and brand names duplicated on med list	1	0
duplicate medication orders with differing dosing instructions	3	0
medications prescribed at discharge	3	4
prescribed with known allergies/intolerances	3	0
illegible or confusing discharge instructions or medication instructions	5	4
conflicting information from different providers across the system	2	1
Total provider-level issues	**27**	**17**
System-level issues*		
discharge instructions or medication list incomplete or unavailable	3	3
lack of appropriate services in place for return to the community	1	0
did not have new prescription after discharge	3	3
incorrect label on medication	0	1
Total system-level issues	**7**	**7**

	February	March
Emergency Department visits, hospital admissions		
ED visit within 30 days after home med rec visit	2	2
Hospital admission within 30 days after home med rec visit	2	1
Nursing interventions		
home medication reconciliation completed	30	31
assessment of health literacy and teach back completed	30	31
caregiver assuming responsibility for medications identified	3	2
follow up visit with PCP	6	8
home care episode started	28	27
telehealth started	0	1
medication education	20	23
medications reconciled with PCP	17	14
mediplanner set up	3	7
referral for MSW	2	1
barriers to care identified	11	7
med equipment ordered	0	1
Total nursing interventions	**150**	**153**
Process measures		
increased understanding of medications and related disease processes	30	31
completed medication teaching and health education	30	31
demonstrated teach back documented	30	31
patients' self-reported ability to manage diseases	28	30
Outcome measures		
reduced medication discrepancies across transitions of care	30	31
decreased hospital readmission rates across the specified population	28	30
improved ability of patients to understand and self-manage multiple medications	27	29
**see definitions for patient-, provider-, and system-level issues in Appendix H*		

References:

Concord Regional Visiting Nurses' Association (2015). Home Medication Reconciliation Program, electronic medical record data from CRVNA and DHC, and internal reports.

Concord Hospital Medical Group (2015). Electronic medical record data and internal reports.

Appendix H

Definitions for patient-, provider-, and system-level issues

All the issues listed were identified at the time of a home medication reconciliation and teaching visit after patients were discharged from the hospital or post-acute care facility to home.

Patient-level issues:

does not have all medications in the home – medications on discharge list and/or PCP medication list are not all present in the home

did not fill new prescription – either chose not to fill new prescription or had barriers (i.e. financial, transportation to pharmacy) that precluded filling new prescription

money/financial barriers – may or may not have been identified while in hospital or post-acute care facility

taking incorrect dosage – may be due to lack of correct dosing information or lack of understanding of what correct dose should be

taking OTC medications without informing PCP – this may include supplements, herbals not reported at time of admission and not on active medication list with PCP

intentional non-adherence – patient knows medication should be taken, but chooses not to

unintentional non-adherence – patient does not understand how to take medication

lack of knowledge of or reason for prescribed medications – patient does not understand why medication was prescribed

sight or dexterity limitations or cognitive impairment – patient has difficulty with sight and reading medication labels, issues with fine motor skills and cannot open/close medication bottles, or has cognitive impairment and may not be able to self-manage medications

adverse drug reactions or side effects – patient is not taking medication(s) prescribed at time of discharge that patient had an adverse drug reaction or side effect to in the past

expired meds in home – patient has medications stored in the home that have expired, but has not disposed of them and may have them stored with all other medications

number of medication errors – total number of potential or actual medication errors identified in the patient's home

Provider-level issues:

discrepancies between PCP – discharge medication list from hospital or post-acute care facility and PCP's active medication list for patient do not match

duplicate medication orders - generic and brand names duplicated on medication list

duplicate medication orders with differing dosing instructions – same medication with two (or more) different dosing instructions

medications prescribed at discharge – total number of medications prescribed at time of discharge from hospital or post-acute care facility

prescribed with known allergies/intolerances – patient given prescription to take post-discharge for medication(s) causing allergic reaction or intolerance in the past, which was noted as allergy/intolerance on the medical record and discharge record

illegible or confusing discharge instructions or medication instructions – discharge instructions and/or instructions for medications not readable, or wording is confusing or unclear about how to self-manage care and medications

conflicting information from different providers across the system – patient's discharge instructions and/or medication list may differ from discharge summary or instructions or medication list included with referral to home care provider

System-level issues:

discharge instructions or medication list incomplete or unavailable – patient was discharged with an incomplete medication list or discharge instructions, or was not given discharge instructions and medication list before discharge to home

lack of appropriate services in place for return to the community – needed resources may or may not have been identified prior to discharge, and patient returned home without necessary services to support self-care and management

did not have new prescription after discharge –new prescription had either not been filled or picked up at pharmacy after discharge, so was not available for patient to take at home

incorrect label on medication – medication label from pharmacy did not match provider's instructions for taking medication

Reference:

Concord Regional Visiting Nurses' Association (2015). Home Medication Reconciliation Program.