

Reducing Readmissions through Medication Reconciliation Program in Primary Care

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Abstract

Background: Hospital readmissions are a major expenditure within our healthcare system. Poor medication adherence and literacy greatly increases the risk of readmission. To combat this problem insurance payors incentivize prompt and effective post discharge medication reconciliation and education.

Objective: To develop and implement a protocol in a primary care clinic utilizing a proven medication assessment tool to improve patient understanding resulting in improved readmission outcomes, medication literacy, and self-management regarding patient medication adherence.

Methods: The project was conducted in two parts over a six month time frame. Initially, data was collected using web-based insurance portals for a two months for patients of an independent primary care clinic. Next, a protocol was developed to increase the capture and scheduling of recently discharged patients. Once in the clinic the Self-Assessment of Medication (SAM) tool was administered to quantify a patients understanding of their medication regimen.

Results: Results did not show statistical significance among reducing hospital readmissions within the primary care clinic. However, more patients were identified in the SAM tool cohort and were readmitted at a lower rate.

Conclusions: The findings of this project indicate that prompt and effective medication reconciliation and patient education in a primary care setting following hospitalization can positively effect readmission rates where no current policy exist.

Key words: hospital readmission, medication reconciliation, medication literacy

Healthcare in the United States is shifting from a fee-for-service to a value-based care model. Primary care is well positioned to screen for future health concerns, manage chronic disease and identify gaps in understanding within the community (Dunphy, Winland-Brown, Porter & Thomas, 2015). The goal of this shift is improved health outcomes while reducing limited resources. Medication adherence and literacy is a growing issue within the patient community this author serves. Through comprehensive assessment and education, post-discharge hospital readmissions can be reduced.

Overview

Background

Hospital readmissions are a growing problem in the United States costing upwards of 17 billion dollars to an already fragile healthcare system (Zuckerman, Sheingold, Orav, Ruhter & Epstein, 2016). While many readmissions remain unpreventable due to the progression of chronic conditions, an increasing number are found to be a result of inadequate medication education and reconciliation at discharge. Randomized trials have shown that up to 75% of all readmissions can be prevented with quality education, patient assessment of discharge and medication information, and post-discharge care (Conner, Gum, Schonfeld, Beckstead, Meng, Brown & Reynolds 2018). As impressive as these figures are, it is unreasonable to assume every discharged patient qualifies for, or can afford in-home care or a rehabilitation facility. Despite an emphasis on more rigorous discharge education, hospitals in a Midwestern city continue to be inundated with patients, requiring quick patient turnover. Obstacles too, exist in the outpatient setting including medication literacy and discharge comprehension. Patients often have an inadequate level of knowledge regarding treatment plan and medication regimen post-discharge.

The population in the United States is an aging one; both in a larger sense and within the patient community of an independent primary care clinic in a Midwestern city. Nearly all of the patients within the independent primary care community in a Midwestern city are insured at some level, with Medicare serving as one of the more prevalent insurers of those recently discharged from inpatient or emergency care. Currently Medicare, and most commercial insurers define successful post-discharge consultation as visiting with greater than 80% of patients within 30 days of release from in-patient or emergency care (Healthcare Effectiveness Data and Information Set, 2016). The current Healthcare Effectiveness Data and Information Set (HEDIS) measures set the target of less than 10% of readmissions (number of readmissions/number of admissions) for the United States. There exists a need for improved medication reconciliation and education from an outpatient primary care perspective. Medication reconciliation includes updating outpatient medication list with discharged medication changes. 2016 hospital readmission data from a primary care clinic in a Midwestern city was 18%, much higher than the HEDIS goal. Further analysis of this vulnerable population would help to identify avoidable readmissions.

Reducing patient readmissions to the hospital is the ultimate goal of this project. There are multiple stakeholders of this program. Hospitals are penalized when patients are readmitted within 30-days of discharge with certain diagnoses; the same holds true with primary care providers. Insurance companies often bear the financial brunt of readmissions. Incentives have been developed by these payers, rewarding providers and hospital systems that work toward mitigating this problem (Chen & Grabowski, 2017).

Problem Statement

Decreased hospital readmission was the ultimate goal of this project however,

improved statistics with payers, leading to fewer provider penalties and possible incentives has become increasingly important among primary care providers. As the shift from fee-for-service to a value-based care model occurs, there will be a continued emphasis on proactive patient education. A medication reconciliation program (MRP) utilizing the self-administration of medication (SAM) tool will assist providers in recognizing potential gaps in knowledge.

Purpose Statement

The clinical question for this project was “if recently discharged patients who are seen within 14-days for a post-hospital examination, and undergo the MRP assessment, are found to have a reduced readmission rates compared with patient who do not participate in the program?”

Outcomes

The expected outcome for this project was that the MRP would reduce readmission rates, bringing the clinic closer to national standards. The development of a clinic specific medication literacy tool to administer to patients, post-hospitalization, following consultation with their primary care provider, can help to meet industry goals. This tool was used to identify gaps in knowledge of discharge medications and the treatment plan set forth at hospital discharge. Additionally, the patient-provider relationship should be enhanced; improved communication and a better understanding of patient specific health disparities can be obtained by using the MRP.

Review of the Literature

Articles published between 2008-2018 in English were reviewed. A full text database search was conducted of CINAHL, PubMed, MedLine, with publication dates of 2008-2018, and Cochrane Database of Systematic Reviews using publication dates of

2013-2018. No design types or levels of evidence were excluded from this search. The search terms used were hospital readmission, readmission, Medicare, outpatient medication reconciliation and medication reconciliation. This search produced thousands of articles. Further exclusion criteria included pharmacist, pharmacy, telephone, and telehealth in an effort to concentrate articles looking directly at outpatient, provider-led medication reconciliation programs and tools with an aim to reduce readmission.

Articles that did not mention medication reconciliation or readmission in the title or the abstract were not included. 14 articles met the aforementioned set of criteria. Of the 14 articles, six were chosen after selecting for the term hospital readmission (Appendix A).

Confirmatory Findings

The purpose of this project was to reduce avoidable hospital readmissions through prompt medication reconciliation in a primary care clinic. However, the literature review found conflicting results regarding the strength of this intervention. Research conducted by Lindquist, Yamahiro, Garrett, Zei, & Feinglass (2013) found a significant reduction in medication errors following a post-hospital visit within 48 hours of discharge. Lindquist et al. (2013) utilized controlled case studies in order to determine whether there are protective effects of medication reconciliation by providers within 48 hours of discharge. Lindquist et al. (2013), discovered a mean of greater than 2 medication discrepancies per patient during follow-up. The most common discrepancies included incorrect medication, dose and rate. Lindquist et al. (2013) concluded these errors were a major cause of avoidable readmission. This data highlights the importance of prompt consultation, need for oversight and patient education. While this information underscores the purpose of

this author's project Lindquist et al. (2013) had the inability to enroll more patients (n=114), which limits the clinical application of the findings.

MRP Tools

Like Lindquist et al. (2013) findings from Muegge (2014), illustrates the clinical impact of assessing medication literacy and how it affects health outcomes. Medication reconciliation is a process that needs to be taken seriously to avoid discrepancies and adverse outcomes that lead directly to increased cost or harm (Muegge, 2014). Muegge (2014) identifies various tools used successfully for medication reconciliation in a primary care setting, based on that author's experience. There was no clinical research or research evidence to support the use of such tools.

Conflicting Data

Research from Field, Ogarek, Garber, Reed & Gurwitz (2015) incorporated a large sample size, however found no protective benefit from post-hospital medication reconciliation within seven days of discharge. Field et al. (2015) conducted an observational study set with a randomized controlled trial of 3,661 discharged patients over a one-year period. Of those patients 1,000 (27.3%) saw their own primary care provider within seven days of discharge, while another 1,808 (49.4%) saw another provider for an office visit during this period. A major drawback of the Field et al. (2015) research was their failure to incorporate non-physician providers, including but not limited to nurse practitioners. While the data carries weight, it does not take into account the unique perspective and practice style that is central to the success of this project. Like Muegge (2014), Field et al. (2015) utilized multiple methods of capturing patients following discharge for medication reconciliation.

Retrospective Data Collection

Conflicting research on the merits of post-hospital medication reconciliation questions the overall readmission rates assigned specifically to adverse medication reactions. Results from a retrospective cohort study from Hauviller et al. (2016) found adverse medication events accounted for 8.7% of readmissions in a singular, large health system in France. Hauviller et al. (2016) concluded these events could have been avoided with more stringent medication reconciliation and promotion following discharge, such as utilization of the methods proposed by Muegge (2014). Interestingly, 8.7% readmission were primarily due to adverse medication reaction. This signals an even larger amount of readmission were likely in some manner due to poor medication reconciliation (Hauviller et al., 2016) data echoed by research from Fields et al. (2015). Similarly, research from Picker et al. (2015) found a correlation between the number of medications at discharge and higher rates of readmission. Important for this project, Picker et al. (2015) found statistical significance concerning the number of new medications as a predictor of readmission. Due to the rapid nature of patient turnover in a hospital setting, post-discharge capture is more critical than ever. This underlines the importance of pre-discharge education and post-discharge capture in a primary care setting to assess adherence and understanding.

Choosing a Method

Muegge (2014) introduced a number of different methods for how to introduce medication reconciliation protocols into practice; however, she did not weigh these methods against each other. Hung & Leidig (2015) used systematic reviews of descriptive and qualitative studies to assess the success and implementation of evidenced based transition intervention programs along with community based health care models with the goal of reducing readmissions. Like Lindquist et al. (2013), results from Hung &

Leidig (2015) identified a significant reduction in readmissions when these measures were deployed. Similar to Lindquist (2013), Hung & Leidig (2015) had a limited sample size. Unlike Muegge (2014), Hung & Leidig (2015) set out to differentiate between different programs however, constantly changing policies and lack of adequate participation diluted the sample and made it difficult to assess.

Each of the aforementioned articles (Appendix B) targeted older adults, listed as 65 years or older a demographic this author will focus on during this project. Not all of the articles selected generated successful results. The varied nature of the research based evidence highlights the multi-faceted issues within post-hospital discharge as it pertains to medication reconciliation. Each article offers different components that this author plans to utilize to reduce hospital readmissions through the assessment and reconciliation of medication post-discharge.

Theoretical Framework

Healthcare suffers greatly from an overarching inability to efficiently translate valuable research findings into clinical practice. The advent of the internet has allowed researchers from around the world to share data, findings and ideas instantaneously, yet translation of evidence-based research into practice remains a significant barrier (Curtis, Fry, Shaban & Considine, 2017). Funk's Model for Improving the Dissemination of Nursing Research and the BARRIERS scale (White, Dudley-Brown, Tehaar, 2018) were chosen to reduce transition gap. The Funk Model supports three mechanisms that promote quicker dissemination of research in practice, including leading practice focused meetings, recording project-specific notes, and developing a medium that allows for ongoing consultation and dissemination of results (White, Dudley-Brown, Tehaar, 2018). The goal of the Funk Model is to effectively transfer best practices and relevant findings

into practice; such is the case with this author's project.

Organizational Assessment

The independent primary care clinic in a Midwestern city is aligned with an Accountable Care Organization (ACO), which provides detailed information on Medicare patients. Those in the clinic receive quality measure scores from the Center for Medicare and Medicaid Services (CMS). Quality measures include, colon cancer screening rates, mammogram completion rates, diabetes compliance, hypertension and hypercholesterolemia medication adherence and hospital readmission data. Quality measure scores are incentivized through financial bonuses paid to providers and clinics who achieve national targets.

Hospital readmission and medication reconciliation are two measures that have been emphasized by CMS in 2018. While this independent primary care clinic met quality measure scores in 2017, early returns from 2018 yield significant increase in readmissions. National targets have been revised due to the rising financial strain of hospital readmissions, and this clinic's numbers are falling further behind. Barriers to the objective of this initiative include patients who may not be willing to be seen post-discharge within the proposed time period of 14 days.

Methodology

This project was designed for internal organizational improvement of post-hospital transitional care management of an independent primary care clinic in a Midwestern city aligned with an Accountable Care Organization (ACO). The findings of this project are intended to demonstrate a reduction in hospital readmissions. This project is not funded or supported by an outside entity. To help facilitate early and comprehensive capture of the Medicare post-discharge population, this author provided

the medical receptionist with a list of patients to be seen following discharge. If the patient were to have any questions or concerns, this author educated him or her on the benefits of seeing their clinician within 14 days of discharge from the emergency department (ED) or hospital. Prompt medication education and reconciliation strengthens communication between patient and provider.

Setting

This independent, primary care clinic based in a Midwestern city employs seven providers: six physicians and one nurse practitioner with an overall patient population of approximately 8,000 patients spanning all ages. The office staff includes four medical receptionists, three secretaries, one medical coding specialist, a billing specialist, five medical assistants, a registered nurse and an office manager.

This clinic includes 18 patient rooms, a functioning lab and x-ray machine, four provider offices, in a middle class neighborhood in a Midwestern city. This clinic serves patients from all around eastern Nebraska and western Iowa; however, a majority of the population reside in a two-mile radius of the clinic. This area has a higher mean household income than the average Nebraska zip code. It is primarily a White community (88%), of which nearly all possess at least a high school diploma (97%) (Census, 2018). These figures are representative of the Medicare population for this clinic, when referenced in a web-based platform provided by this clinic's ACO. Providers offer same-day care as well as chronic condition management, wellness exams, physicals, Department of Transportation (DOT) physicals, pre-employment exams, well-child exams, school physicals, sports physicals, Medicare wellness exams and Medicaid physicals. The clinic is not affiliated with any other medical offices or health system.

Utilization data from 2017 within the web-based platform shows 328 overall ED

visits, which led to 99 hospitalizations of this population; a 30% admission rate. 165 patients completed a 30-day post discharge visit with one of the providers (HEDIS, 2016). Overall, 7.93% of this population was readmitted to the hospital within the 30-day period. Data from January 1, 2018 until June 30, 2018 revealed 117 ED visits with 41 hospitalizations; a 35% admission rate. These statistics are similar to the 2017 data for the clinic. Similarly, 65 patients completed a 30-day post-discharge visit with one of the providers, however the clinic's readmission rate nearly triple to 18.80%. Permission to complete this project at the independent, primary care clinic was obtained by the office manager.

Sampling

The project focused on the Medicare population within a Midwestern, independent, primary care clinic. Medicare covers adults aged 65 years and older, patients placed on disability or with End Stage Renal Disease (ESRD) (CMS, 2018). The Medicare population of this clinic is 1,069 (20.8%) patients. Information regarding hospitalizations, medication adherence, screening measures, immunizations, depression screening, fall risk assessment, blood pressure and diabetes management can be accessed and updated through multiple ACO supplied portals. These ACO portals allow for real time identification of in-patient and recently discharged patients of this population. Demographic metrics of this clinic's Medicare population include an average of three chronic conditions, of which hypertension is the most common; and an average age of 73 years (Health Endeavors, 2018).

The project focused on this population because of the poor health outcomes associated with hospital readmission and difficulty managing medications within this sample (Jencks, Williams, Coleman, 2009). Included in this sample are the

aforementioned characteristics, greater than or equal to 65 years of age, those deemed disabled by CMS, or those battling ESRD. This sample has been uploaded into the web-based platform with assistance from the ACO to best manage this population, per CMS regulations. The web-based platform excludes all patients within the clinics population who do not meet one of these three criteria. This tool allows for real time identification of in-patient and recently discharged patients of this population.

SAM Tool

In order to measure the outcomes of this capstone project, the Self Administration of Medication (SAM) tool was used. The SAM tool (Appendix C) is a 14 question evaluation of the patient's ability to self-administer medications. The tool assessed the patient's ability to name medications, identify the correct dosage, translate instructions, identify shapes and colors of medications, open and close medication containers, place medication in mouth and obtain proper amount of fluid to consume medications. This tool helped identify gaps in knowledge and ability and further transfers ownership of a patient's health by education of his or her regimen.

The SAM tool is a valid and reliable measure for quantifying patients' ability to manage their medications (Anderson, Manias, Kusljic & Finch, 2014). The SAM tool had a high content validity scores with regard to clarity, representation and comprehensiveness with content. Internal consistency for the SAM tool was high with a correlation coefficient of 0.819 (95% CI 0.666 to 0.902) (Manias, Beanland, Riley & Hutchinson, 2006). A moderate to strong correlation was obtained when comparing the SAM tool with other validated self-administration assessment measures. Permission to utilize the SAM tool for the project was requested and consent for usage was acquired from the developer of the SAM tool, Dr. Elizabeth Manias, Research Professor at Deakin

University in Victoria, Australia.

Implementation Procedures

Identification of discharged patients is the initial step of the process and was two-fold. Identification of recently discharged patients was completed on a daily basis by this author and the names given to the medical receptionist. The medical receptionist was instructed to schedule these appointments within 14 days of the patient's discharge date when she received the call to schedule the appointment from either the patient or the hospital staff. The clinic nurse collected the patient's discharge summary and medication list from the hospital-based encounter using both hospital specific medical records departments as well as Nebraska Health and Information Initiative (NeHII), an online tool that allows for remote access to discharge summaries, history and physicals, lab work, imaging, and medication lists of every major hospital and health system within this Midwestern city. Secondly, the clinic nurse accessed the United Health Care (UHC), Humana, Blue Cross Blue Shield (BCBS) or Coventry insurance web portals that provide live-insight into current in-patient and discharge status, depending on the patient's insurer. The medical receptionist attached copies of the SAM tool to charts of patients who were eligible for assessment prior to the patient arriving for his or her appointment.

Upon arrival to the clinic, the medical assistants registered the patient and notified the clinic nurse of the patient's arrival. The patient was escorted to an exam room by the nurse. The nurse obtained vital signs, reviewed social and family history and reconciled medications with discharge paperwork. Changes were made in the electronic medical record (EMR) for the provider to review. The provider next saw the patient. Any changes to the medication regimen based on the primary care provider's assessment of medications was updated in the EMR. Following these steps, the SAM tool was

administered to the patient by the nurse. Of the 14 questions within the SAM tool, not all applied to each patient. Those questions were skipped and were not considered when determining whether a patient was capable of self-administration. The SAM tool was not administered if the patient was not in charge of his or her medication regimen. If the person who handles medications for the patient was present, the SAM tool was administered to them. If the primary medication handler was not present during the appointment, the SAM tool was not administered to the patient. The SAM tool was scored outside the room and the score conveyed to the provider. If it was determined the patient was not able or safe to self-administer medication it triggered a follow up phone call within the next two business days in order to reassess gaps in understanding and assess compliance, or prompt the provider to discuss a home health referral for safety.

Data Collection Procedures

Data collection began with identification of eligible post-hospital appointments. The tool used clinic specific EMR numbers as the only patient identifier. Patient EMR numbers were kept on a spreadsheet along with date of discharge, date of clinic appointment, and SAM tool score and readmissions status. These scores were kept for evaluation of hospital readmission rates. Rates were compared with previous data of hospital readmission rates within the clinic by the aforementioned insurance portals and clinic specific Medicare approved websites.

Ethical Considerations/Protection of Human Subjects

Nebraska Methodist College Institutional Review Board (IRB) approved initiation of this project on April 3, 2019. Collaborative Institutional Training Initiative (CITI) certification was obtained by the researchers. Informed consent was obtained for each patient who participated. Refusal to participate in this project did not alter care with the

provider. Ethical considerations regarding safety for patients who scored less than 7 on the SAM tool deemed incapable of self-administering their own medications were discussed. Providers contacted family to assist with medication adherence and administration. Those who did not have family to assist were referred to home health services and it was requested the agency see the patient on the same day. A combination of three separate home health agencies were utilized to ensure same day service. No patient chose to return to the clinic for medication administration.

Health Insurance Portability and Accountability Act of 1996 (HIPAA) law was maintained as only this author and the providers were privy to SAM tool results. This author utilized office specific EMR numbers on SAM tool score sheets and not patient names. Scores were scanned into the corresponding patient charts.

Data Analysis

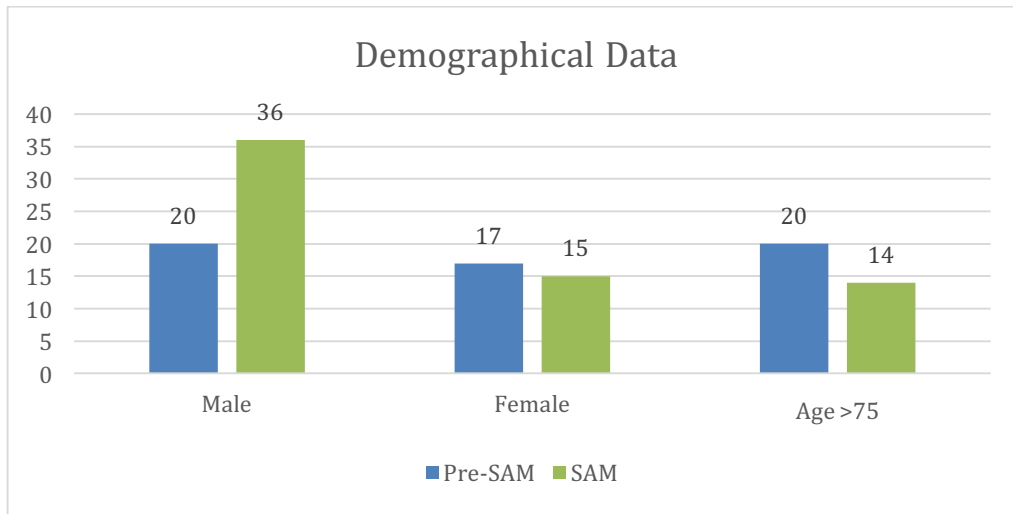
Data was largely collected from insurance and CMS portals focused on recently discharged patients. Clinic readmission rates from January 1, 2019 through February 28, 2019 were compared against readmission rates from April 3, 2019 through May 31, 2019, when the SAM tool was utilized. Data was collected and organized on an excel spreadsheet document secured on a data encrypted computer within the clinic. This document was only be accessible by password, and the password was given to the primary investigator by clinic manager for the sole use of this project. Clinic specific patient medical record numbers (MRNs), date of birth, hospital discharge date, date of post-hospital clinic visit, number of days post-discharge, number of medications, SAM tool score and date of readmission (if applicable) were recorded. SAM tool scores of 8 (maximum 14) signified an acceptable level of medication understanding (Richardson, Brooks, Bramley, & Coleman, 2014). Patients scoring less than 7 were flagged and

reviewed with the provider. Action plans were developed for patients deemed unfit to handle their own medications. This determination was made by the provider, following both visit and consultation over SAM tool results. Action plans included involving family members to assist in medication administration as well as referrals to home health agencies, social work and medication aides. Contact with family members, gleaned from HIPPA forms, was attempted the same day as their appointment. If no viable plan was implemented prior to leaving, patients were given the choice of enlisting family members to assist at home, asked to return to the clinic the next day for assistance with medication administration and continued education by nursing staff, or referred to home health services. Post-visit communication via telephone was conducted via clinic nursing staff within 48 hours to ensure these measures were still being utilized.

Results

Both the January-February, (pre-SAM group), and April-May, (SAM group), samples were comprised of 43 clinical days of operation. The pre-SAM tool group was composed of 37 Medicare eligible patients; 54.1% (20) males and 46% (17) females; 54.1% (20) of this cohort was over 75 years old (Figure 1). However, 54.1% (20) were not seen within 30 days of discharge. Ultimately, 18.9% (7) patients within the pre-SAM group were readmitted over this time period (Figure 2).

Figure 1. Demographical Data



The SAM group was composed of 51 Medicare eligible patients; 70.6% (36) males and 29.4% (15) females; 27.5% (14) were older than 75 years old (Figure 1). Despite increased efforts for identification 19.6% (10) of the SAM group were not seen within 30 days of discharge; six of whom were unable to be contacted and four declined follow-up appointment (Figure 3). Of the 41 patients seen in clinic, 30 were seen within seven days of hospital discharge, the 11 remaining patients were seen within two weeks (Figure 3). The SAM tool was successfully applied to all 41 patients. Thirty-three patients scored at or greater than 8 on the SAM tool, the remaining eight patients scored lower than 8 (Figure 4). Of these eight patients, six of them were referred to home health services for assistance with medication administration and adherence, the other two were assisted by family. All eight were discharged with a new prescription. Of these eight, only one was readmitted to the hospital. Overall, 15.6% (8) in the SAM tool group were readmitted to the hospital within one month of discharge (Figure 2).

Figure 2. Readmission Rates

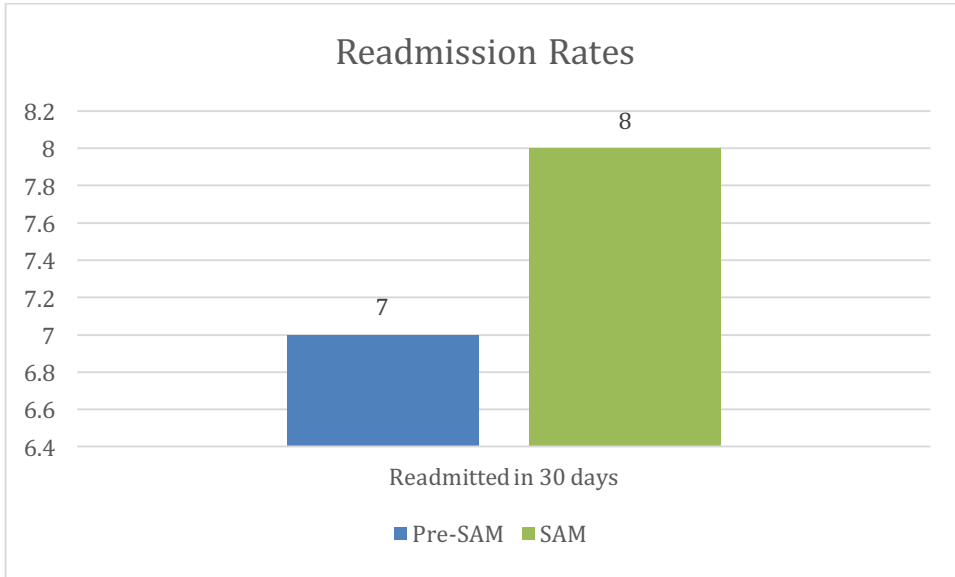


Figure 3. Follow up Visits

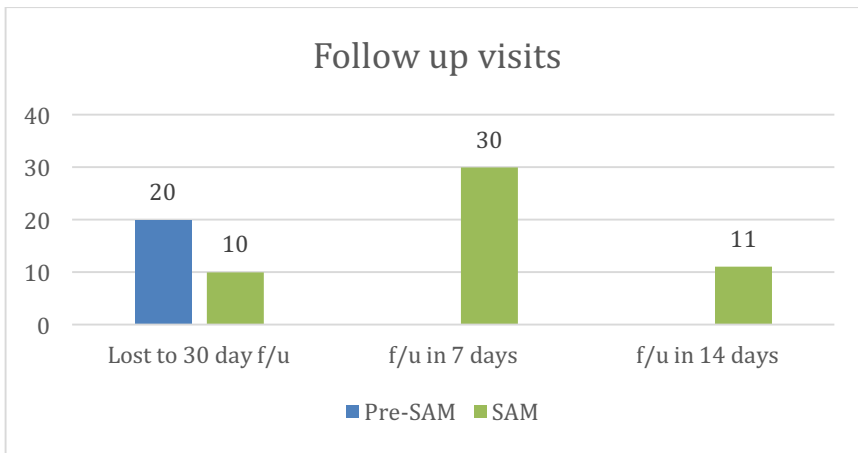
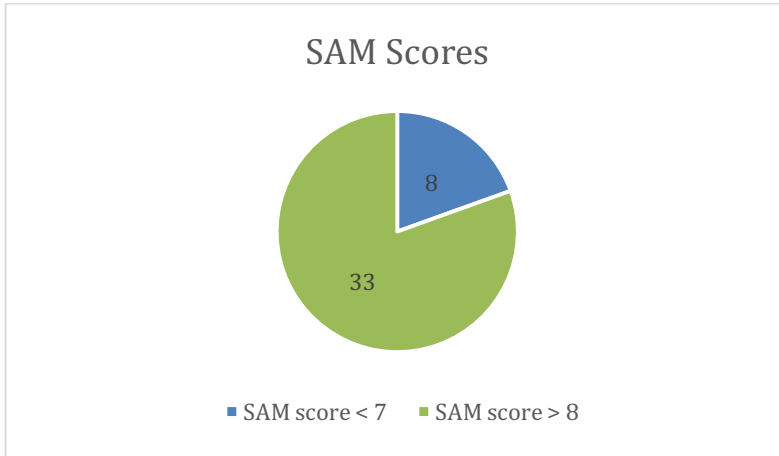


Figure 4. SAM Scores



Analysis reveals no statistical significance following the introduction of the SAM tool to reduce hospital readmissions, p value = 0.6531, 95% confidence interval (Figure 5). Even when patients who declined to be seen were subtracted from the group there was no statistical significance, p value = 0.8760, 95% confidence interval (Figure 6).

Figure 5. Statistical Significance: pre-SAM Tool (dark grey) vs. SAM Tool (light grey)

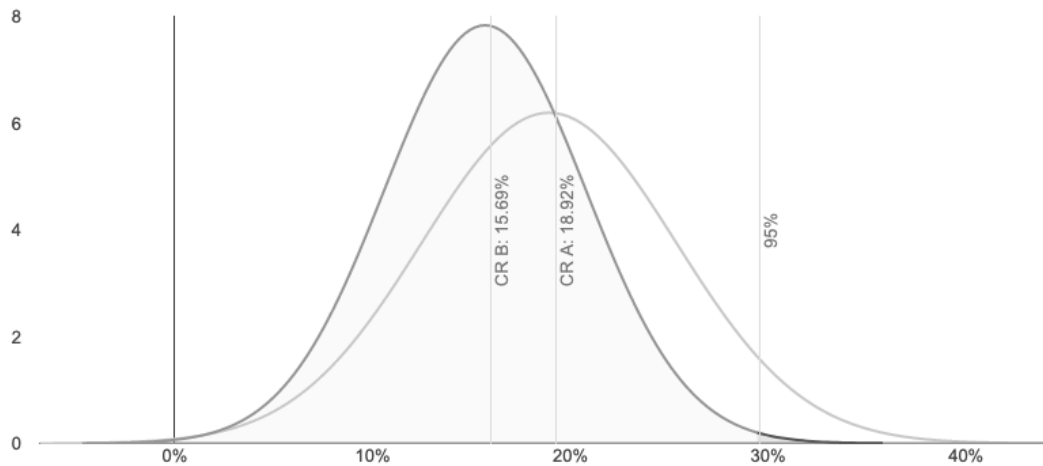
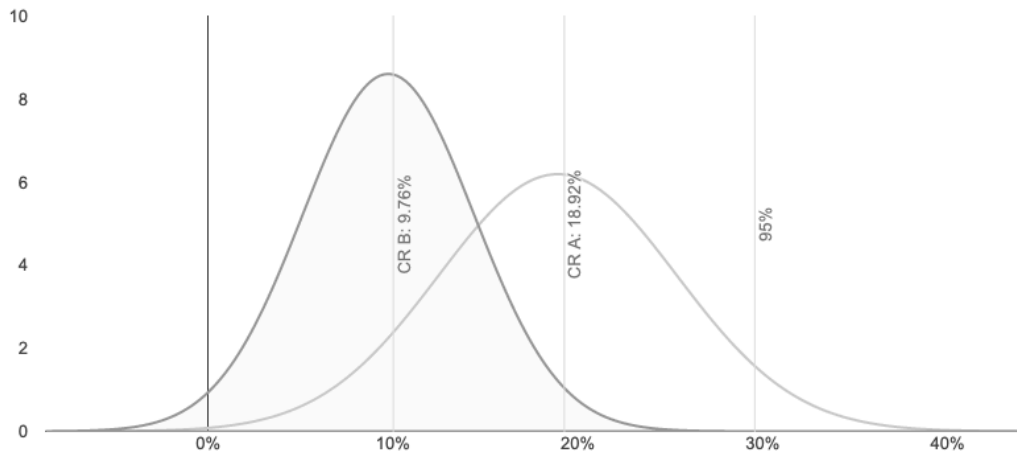


Figure 6. Statistical Significance: pre-SAM Tool (dark grey) vs. SAM Tool (light grey) without patients who declined post-hospital follow-up



Discussion

Among the most consistent patient feedback was how valuable addition education and discussion on medications, therapies and chronic conditions were to better understanding treatment plans. These comments were communicated to both providers and administration within the clinic. This sentiment was reciprocated by providers who universally felt this program strengthened their connection to their patients and worked to bridge the gap in health management following hospitalization.

While results of this project did not show statistical significance, further research within this independent primary care clinics in a Midwestern city is warranted. Increased utilization of web-based portals allows for recognition of discharged patients, while medication assessment can trigger added education or follow-up from clinic support staff. The continued push toward shared health records among community health systems will further facilitate accurate and prompt reconciliation. Engaging this vulnerable population through assessment and education is paramount to reducing hospital readmission.

In addition to the improved patient readmission outcomes, insurance payors allow for increased reimbursement when certain medication reconciliation steps are taken by providers following discharge. Requirements vary between insurance payors, however, primary care clinic staff, including nurses, are becoming more useful in completing these measures further suggesting dedicating resources to this aspect of care.

Limitations

Ample results regarding the impact prompt medication reconciliation has on readmission rates were available during the literature review search. However, there was limited current research with regards to interventions from an independent primary care standpoint. Most research was health system exclusive in which information and appointments were easily acquired and communicated. Lack of communication between the three main health systems was a major barrier in successfully scheduling and obtaining vital records for review. In general research favors these large health systems due to their ability to compile and store data. At the same time, fewer independent primary care clinics exist and are able to assess these issues on a significant basis. These limitations were offset by the great lengths clinical and reception staff went to obtain discharge summaries and prompt appointment schedules.

Plan for Sustainability

Results were shared with the providers and management within the independent primary care clinic in a Midwestern city. Authorization for the use of the SAM tool was granted for use within the project, thus would not be available or clinic staff. Since the introduction of the SAM tool was not shown to significantly reduce hospital readmission

rates, no additional request for utilization was made. All resources and protocols were left with clinic management for further use.

Implications for Practice

The project could have a significant impact on reducing hospital readmission rates with prompt medication reconciliation. As a result of the project, the staffing needs and roles within this clinic could be reevaluated. Reducing readmissions will be included in the HEDIS measures leading to financial implications for providers who are not proactive in addressing this problem. This project offers a quick and easy way of better understanding patient knowledge as well as assessing risk of readmission. Interventions are tailored to identify patient needs and improve health outcomes; however, the financial incentive to improve these measures in accordance with national guidelines will ultimately shape the need in this setting.

Conclusion

Hospital readmission is a growing issue within the United States healthcare system, both financially and in poor health outcomes. While inherent barriers exist throughout the discharge process, numerous web-based portals provide critical information to assist in identification and data collection. Prompt outpatient medication reconciliation represents an important aspect of patient safety and compliance. Primary care clinics serve as the focal access point for patient seeking assistance and education regarding their health. Promoting effective communication between discharging hospitals, clinic staff, patients and providers leads to improved health outcomes and fewer hospital readmissions.

Despite not showing statistical significance, this project was successful in narrowing the hospital readmission gap closer to the national benchmark. Discussions within the independent primary care clinic in a Midwestern city support the continuation of the protocol for identification and prompt scheduling for post hospital follow up. However, these appointments will not include the use of the SAM tool, for a number of reasons. Permission to utilize the SAM tool in the clinic was granted until the end of this project. While research has shown the SAM tool to be an effective medication assessment, the providers in the independent primary care clinic in a Midwestern city stated a preference toward a less time consuming tool. Collaboration between hospital systems and outpatient clinics to develop a tool is warranted.

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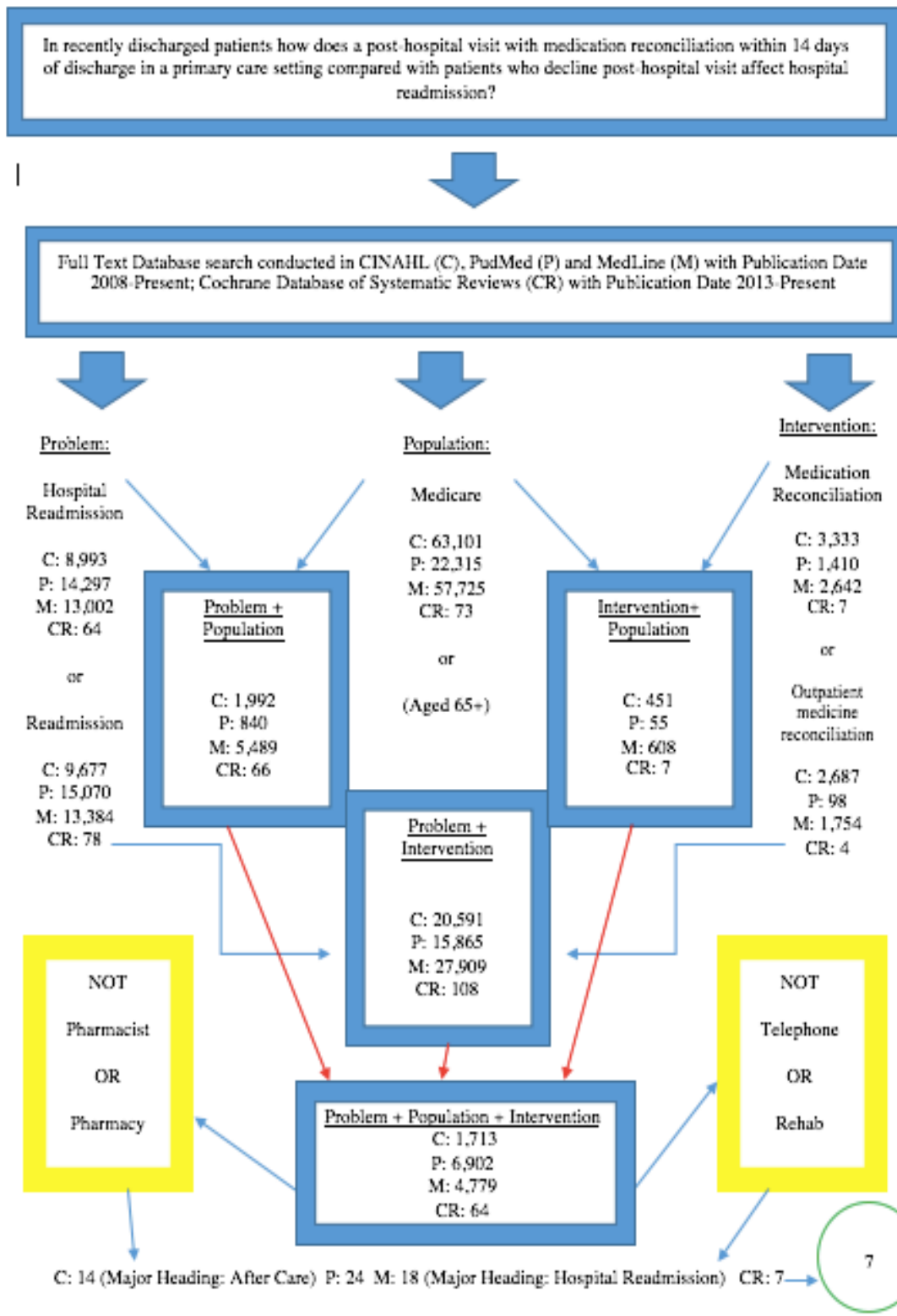
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Appendix A

Search Trail for Literature Review



Appendix B

Reference Matrix

Citation	Level of Evidence	Sample Size	Purpose	Design	Findings & Discussion	Strength/Weakness	Application to Capstone
Field, T.S., Ogarek, J., Garber, L., Reed, G., & Gurwitz, J.H. (2015). Association of early post-discharge follow-up by a primary care physician and 30-day re-hospitalization among older adults. <i>Journal of general internal medicine, 30(5), 565-571.</i>	Level II: Data obtained through observation study within a randomized trial.	n = 3,661 3,661 patients discharged into a home setting during this study; 1,808 (49.4%) of the sample were seen for an office visit within 7 days; 1,000 (27.3%) of those were seen by a primary care physician. Older Patients = 65+ years-old	Researchers set out to determine whether an office visit with a primary care physician within 7 days after discharge with 30-day re-hospitalization.	Observational study was set within a RCT if EMR-based transitional care intervention for older adults discharged from hospital to home. Messages were sent to patients to schedule an office visit within one week of discharge. Study was conducted in a multispecialty group with 265 physicians	Of the 3,661 patients 1,000 (27.3%) of the sample were seen by a primary care physician. 707 (19.3%) were re-hospitalized. Multiple different analyses showed no protective effect for office visits within 7 days with any provider (PCP or specialist). Follow-up visits are likely to have a better chance of improving outcomes for older patients incorporated into comprehensive	Strengths of this study are they followed a large discharged population over a one-year period. They were given access to a large clinic with multiple physicians. Appointments could not be completely randomized due to confounding factors such as deteriorating health. Limited to	Despite this study only looking at readmission rates of physicians in large, hospital associate clinics, it does provide valuable insight on how prompt office visit relates to re-hospitalization. While it does not yield the findings I would envision with such an intervention. These results help underscore the importance of administering the medication assessment to identify gaps in health literacy.

				(66 PCPS)	transition programs.	physicians-only, no PAs or NPs.	
Hauviller, L., Eyvrard, F., Garnault, V., Rousseau, V., Molinier, L., Montastruc, J. L., & Bagheri, H. (2016). Hospital re-admission associated with adverse drug reactions in patients over the age of 65 years. <i>European journal of clinical pharmacology</i> , 72(5), 631-639.	Level IV: Evidence from well-designed case-control and cohort studies. Hauviller et al. (2016) designed this study as a cohort study with plenty of resources with regards to the French health database that they had at their disposal during the year of information collection.	n = 1,000 A search of a Toulouse database yielded 1,000 patients who were admitted with an Adverse Drug Reaction (ADR) ICD-10 code. These patients were followed and assessed for readmission with ADR associated reasons.	The aim of this study was to assess the rate of readmissions and factors associated with readmissions in an >65-year old population. Secondarily, the researchers looked at the characteristics and rate at which patients with an initial ADR diagnosis were readmitted to the hospital.	They performed a retrospective cohort study in a large French health system. Inclusion criteria was all admission to Toulouse University Hospital of patients >65 year-old in a one-year period (01/01/10-12/31/10) of which the discharge summary included an ICD-10 code relevant to	Over half (55.3%) of patients admitted with ADR related ICD-10 codes were readmitted at least once in a calendar year, and 8.7% (87/1000) were readmitted with an associated ADR diagnoses. 88% of readmission diagnoses had ADR as an 'associated' and not 'primary' diagnoses for readmission. However, this can be misleading and	There were several weaknesses in this study namely it was studied in a single hospital system. Readmissions to other facilities were not taken into consideration. Likewise, patients who died, or moved, were also excluded from the findings. Finally, since the French reporting system has a finite amount of listing	Hauviller et al., (2016) conducted a study of ADR readmissions in a similar demographic for which my capstone is based, however, many of their methods, study design and data collection vary greatly to how I envision my research. Similarly, there are many aspects of their study that do not translate to my population of the health system for which I will be working with. Np patient assessment was completed to identify gaps in

				<p>ADR.</p> <p>Those with insufficient data or those without ADR ICD-10 were excluded from the study.</p>	<p>should not correlate that the ADR was not a driving factor for readmission as in France ADR is often seen listed as an 'associated' diagnoses and never primary, even if ADR is the driving force for admission.</p>	<p>available for diagnoses the ADR was often left off due to other diagnoses that were seen to be of greater importance.</p>	<p>health literacy, a staple of my work, and they made little to no effort to identify gaps and use outpatient visits or education as a solution to this perceived issue.</p>
<p>Hung, D. & Leidig, R. C. (2015). Implementing a transitional care program to reduce hospital readmissions among older adults. <i>Journal of nursing care quality</i>, 30(2), 121-129.</p>	<p>Level V: Evidence from systematic reviews of descriptive and qualitative studies. This study use qualitative methods to examine a programs efforts to facilitate transitions among patient with high risk or preventable readmissions.</p>	<p>Small sample size</p>	<p>Hung & Leidig (2015) set out to examine how implementation of an evidenced based transitions intervention program along with community based health care models can curb hospital readmission in older adults.</p>		<p>Hung & Leidig (2015) found a number of hurdles associate with the roll-out of this transitional care program. While they understood there would be bumps in the road regarding implementation, the constant shift of policies ultimately decreased participation and a perceived lack of anonymitv</p>	<p>There were a number of weaknesses within this study, including small sample size, worry about patient anonymity, inability to adapt to changes the rapidly changing program.</p> <p>Funding. The transition program was</p>	<p>I found this study interesting and relevant to my capstone mainly due to Hung & Leidig investigation of which programs work in terms of assessing readmission risk and how programs were initiated into practice.</p> <p>I was also interested in</p>

					<p>due to small sample size could have altered patient feedback.</p> <p>Hung & Leidig (2105) named four aspects to further enrich this process. They included expanding eligibility of this program, better identification of key stakeholders and getting buy-in at an earlier stage, improving communication and coordination between hospitals and facilities, and better staffing policies to make enrollment for efficient.</p>	<p>funded through two non-profit organizations. If results yield promising figures there comes the question for how this program will be covered.</p>	<p>how unforeseen pitfalls and obstacles were handled and</p>
<p>Muegge, S. (2014). Safety Corner: Make Time for Medication Reconciliation. <i>AAACN Viewpoint</i>, 36(3), 1.</p>	<p>Level VII: Evidence from the opinion of authorities and/or reports of expert committees.</p>	<p>No Sample as this is a piece stating her opinion and sharing her expertise on this matter.</p>	<p>Muegge (2014) writes to continue the conversation regarding the importance of medication reconciliation in</p>	<p>There is no design for this article as is it an opinion piece from an expert on this topic in this</p>	<p>Muegge (2014) sets out to share ideas, insight and her experience regarding the new measures</p>	<p>As an open piece there no study. As this was written four years ago there is much that has</p>	<p>I found this article beneficial as it provides insight into ways and methods for how to reduce medication</p>

	<p>Muegge, an instructor at a Regional Health System in Missouri and member of multiple journal administration boards, assess the Joint Commissions efforts to increase Medication Reconciliation.</p>	<p>She does provide a number of examples to help illustrate her points.</p>	<p>an ambulatory setting.</p> <p>Medication reconciliation is a process that needs to be taken seriously to avoid medication discrepancies and adverse outcomes that lead to increased cost or harm to patients.</p>		<p>limit medication discrepancies.</p> <p>65+ year-old patient's present challenges because they have more health conditions and are likely to have multiple prescribers, and a greater amount of medications.</p> <p>Another important conversation she raises is the increased use of mail-order pharmacies and how that disrupts oversight.</p>	<p>regards to the conversation but the fact remains this is an increasing problem in ambulatory care and no clear-cut tool or method has been developed to systematically rid healthcare of this issue.</p>	<p>medication reconciliation in a primary care type setting. This is a big issue within the clinic I work and many of these tools Muegge speaks on would be helpful.</p> <p>It is critical that I assess all different types of tools and select based on evidence based practice for which method to employ in my capstone. Ultimately, I will also need to marry best practice with which method work best with the population for which I will serve.</p>
<p>Lindquist, L.A., Yamahiro, A., Garrett, A., Zei, C., & Feinglass, J.M. (2013) Primary care physician</p>	<p>Level III evidence. Lindquist et al. (2013) utilized controlled case</p>	<p>n = 114 114 adults who were</p>	<p>Lindquist, Yamahiro, Garrett, Zei & Feinglass (2013) set out to</p>	<p>Lindquist et al., (2013) directed hospitalist to</p>	<p>75 of the 114 patients enrolled completed the <u>48 hour</u> interview with</p>	<p>While the overall sample size was limited, the</p>	<p>Lindquist et al. (2013) inability to enroll enough patients hurts</p>

<p>communication at hospital discharge reduces medication discrepancies. <i>Journal of hospital medicine.</i> 8(12), 672-677.</p>	<p>studies in order to determine whether or not the protective effects of medication reconciliation by providers within 24 hours reduces discrepancies.</p>	<p>discharged home following a >2 4hour medical stay who have >5 prescription medications.</p>	<p>determine whether primary care physician communication and intervention within 24 hours of hospital discharge changed the frequency of medication discrepancies.</p>	<p>communicate with primary care physicians within 24 hours of discharge regarding treatment plan and medications.</p> <p>PCPs were then asked to phone or bring in the patient for an office visit to discuss treatment plan and new medications.</p> <p>Researcher then phoned enrolled patients at 48 hours following discharge to assess whether medication discrepancies</p>	<p>researchers. This assessment yielded 39 (50.6%) patients with medication discrepancies.</p> <p>Mean # of discrepancies = 2.1</p> <p>Patients who were contacted by their PCP were 70% less likely to suffer a medication discrepancy.</p> <p>Males were >4 times more likely to have a discrepancy.</p>	<p>demographic was highly selective, thus they did not examine hospital readmissions.</p> <p>Another limitation of the study due to sample size was the inability to randomize the participants further hurting the clinical significance of the results.</p>	<p>the application for my capstone.</p> <p>Despite the many limitations I feel the data supports further exploration of this idea and the enhanced communication between in- and out-patient providers.</p> <p>Like many studies this one merely looks at physician based care and does not mention NPs or PAs.</p>
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				existed.			
<p>Picker, D., Heard, K., Bailey, T. C., Martin, N. R., LaRossa, G. N., & Kollef, M. H. (2015). The number of discharge medications predicts thirty-day hospital readmission: a cohort study. <i>BMC health services research</i>, 15(1), 282.</p>	<p>Level III: Evidence obtained from a well-designed controlled trial without randomization</p>	<p>n = 5,507</p> <p>5,507 patients were followed from Barnes-Jewish Hospital System.</p> <p>Enrolled participants had to be >18 years in age, admitted through the ED or transferred from another institution.</p> <p>Excluded patients who died.</p>	<p>Picker et al. (2015) set out to assess whether the number of discharged medication is a predictor in thirty-day readmission rates.</p> <p>Picker et al. (2015), also researched any possible predictors of readmission rates within this large urban hospital system.</p> <p>Picker et al. (2015) utilized Fisher exact test, Mann-Whitney <i>U</i> test as well as logistical regression for identifying independently associated variables for 30-day readmission.</p>	<p>Picker et al. (2015) retrospectively evaluated patient of Barnes Jewish Health System who were >18 years-old and admitted to one of the eight inpatient medical units. Medications were tracked and monitored following discharge and assessed for trends following any readmissions. Medications only included daily medications prescribed by a healthcare</p>	<p>Results found the number of discharge medications were significantly greater for patients who were readmitted in a 30-day time frame.</p> <p>Statistical significance was also found in the number of new medications upon discharge for higher rates of readmission.</p> <p>>6 medication increased risk for readmission</p>	<p>This study had many strengths, including its sample size, it did not limit inclusion to only specific diseases, and they looked at potentially causes for readmission as a factor of medication regimens and prescribed medications.</p> <p>Weaknesses included the fact that this was a retrospective analysis, and they did not factor in for medication adherence as it relates to readmission</p>	<p>Picker et al. (2015) conducted a thorough assessment of the adult patient population of St. Louis in the Barnes-Jewish Hospital. While they felt their reliance on one hospital system was a weakness I found the depth of the population is representative of part of the population I hope to assess. Despite strictly researching patients >18 I feel their results apply to most demographics.</p>

				<p>provider.</p> <p>The researchers excluded any over-the-counter, herbal or prn medications from this study.</p>		<p>rates. They also did not have access to out-patient systems that would help identify whether prompt post-discharge visits were completed.</p>	
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Appendix C
SAM Tool

SELF ADMINISTRATION OF MEDICATION (SAM) ASSESSMENT TOOL

Name: _____ Residence: _____
 QMRP/Case Manager: _____ Nurse: _____
 Evaluate the individual's ability to participate in a self-medication program by placing a check in the appropriate box and providing comments

TASK	Yes	No	SUPPORT NEEDED	COMMENTS
Responds when name is called	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Requires physical prompt or gesture <input type="checkbox"/> Other	
Time concept recognition <input type="checkbox"/> am <input type="checkbox"/> pm <input type="checkbox"/> breakfast <input type="checkbox"/> lunch <input type="checkbox"/> dinner/supper <input type="checkbox"/> bedtime <input type="checkbox"/> day of week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Requires pictures to recognize correct time of day to receive medication <input type="checkbox"/> Other	
Understands basic number concepts and is able to count from 1 to 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Requires counter or assistance from staff <input type="checkbox"/> Other	
Identifies different colors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Requires picture to reference pill shape <input type="checkbox"/> Other	
Discerns different shapes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Requires picture to reference pill shapes <input type="checkbox"/> Other	
Identifies his/her name on medication bottle/drawer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Requires special sticker/symbol to recognized personalized medication container <input type="checkbox"/> Other	
Names medication s/he receives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Needs to write medication name to verify	
Knows correct dosage of medication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Requires prompts	
Opens and closes medication containers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Needs assistance	
Pours correct dosage of medication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Needs assistance	
Obtains an adequate amount of medication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Needs assistance	
Puts medication in mouth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Needs assistance	
Obtains adequate amount of fluid to take medication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Needs assistance	
Writes name initials on MAR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Needs assistance	

Based on this evaluation and observation, place a check on the appropriate box for recommendation:

<input type="checkbox"/>	Individual is not able to administer medication to him/her at this time and is not recommended for the "Self Administration of Medication" training program at this time.
<input type="checkbox"/>	Individual is capable of self-administering medication w/ assistance and under close supervision. and/or hands on assistance. The individual will participate in the med. administration and will start an individual training program.
<input type="checkbox"/>	The individual has the potential to self administer medication independently and safely. The individual is recommended by the team to start an individual training program.

Signature of RN completing assessment: _____ Date: _____
 Not recommended for self-medication program Recommended for self medication program
 Signature of Physician: _____ Date: _____