

Transitional Care of Adults with Chronic Diseases Post- Discharge from Acute Settings

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### Abstract

Ineffective transitional care programs for ensuring the continuation of care from acute settings to the home settings post discharge can result in rehospitalization of elderly patients with chronic diseases. Usually, transitional care should be time-sensitive, patient-centered services intended to ensure continuity of care and an efficient transition between health care settings or home. A patient centered transitional care program was implemented at an outpatient primary care facility to reduce readmission rates. Institutional Review Board approval was obtained. Twenty adult patients with chronic diseases discharged from an acute setting were identified. A follow up phone call and/or a home visit within 24-72 hours post discharge was employed. The Care Transitions Measure (CTM®) and Medication Discrepancy Tool (MDT®) were utilized to identify quality of care of transition and medication discrepancies. A chart audit collected data on the age of participant, diagnosis for initial hospitalization, CTM score, home visit, and ED visits or re-hospitalizations after 30 days of discharge. The outcome indicated that transitional care within primary care utilizing evidence-based practices is beneficial in reducing readmission rates. A logistic regression showed model significance,  $p = .002$ , suggesting that the CTM score was effective for both telephone support (TS) and home visit (HV). A correlation analysis showed that as age of participants increased, the CTM score decreased, indicating that older adults required more support. A significance  $p < .001$ , of a proportional test indicated that readmission rates after the intervention was lower. It is evident that providing a timely and effective transitional care intervention in a primary care setting can reduce hospital readmissions, improve symptom management and quality of life of adult patients with chronic diseases.

*Keywords:* elderly, chronic diseases, care coordination, transitional care interventions, transitional care management, symptom management, quality of life.

### Transitional Care of Adults with Chronic Diseases Post- Discharge from Acute Settings

Adults with multiple chronic conditions complicated by other risk factors, such as functional deficits or social barriers, experience multiple challenges in managing their healthcare needs, especially during episodes of acute illness. As a result, this patient group also experiences significantly higher rates of healthcare encounters, including physician and emergency department (ED) visits and hospitalizations. A majority of these patients experience frequent changes in health status that require transitions among health care providers and care settings. These transitions meant to incorporate an in-person contact, phone calls and an interdisciplinary team approach is lacking and profoundly interrupt patterns of effective care management for complex patients (Naylor et al., 2018).

#### **Background and Significance**

Inefficient transition of care is significantly contributing to ever-increasing health care costs. Approximately 60% of community based chronically ill patients transitioning from hospitals to next sites of care or home, experience care deficits (Coffey et al., 2017). The Centers for Medicare and Medicaid Services (CMS) reports that chronic medical conditions such as congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), pneumonia, and acute myocardial infarction (MI) account for a large portion of the transitional care economic burden on health care in the United States (U.S.) and the Medicare Payment Advisory Commission (MedPAC) estimated that the costs associated with 30-day hospital readmissions account for an estimated \$15-\$17 billion annually in Medicare spending (Bindman & Cox, 2018). An additional \$34 billion is lost annually by American businesses because of employees' need to care for elderly family members (Huckfeldt, Neprash & Nuckolset, 2018).

The Department of Health and Human Services (HHS), through the CMS and the Accountable Care Organization (ACO) liaises with health care providers to provide coordinated, high quality care to patients and expects primary care settings to provide transitional care services post discharge from an acute setting (Lewis, Tierney, Colla, & Shortell, 2017). However various primary care settings lack an appropriate guideline or policy set up at the practice to aid in transitional care so hence the issues with noncompliance and nonadherence to medical therapy from patients during the transitional care period after discharge. Bindman & Cox (2018) recently showed that nearly one-fifth of all Medicare beneficiaries are rehospitalized within 30 days and one-third within 90 days of hospital discharge. The issue of these patients in and out of hospitals comes at a price with adverse clinical events, serious unmet needs, poor satisfaction with care, and avoidable readmissions.

Currently the issue with transitional care interventions mainly stem from the problems faced by most primary practice settings. These challenges associated with undesirable outcomes among hospitalized older adults who transition to post-acute settings or their homes are lack of patient engagement, absent or inadequate communication, lack of collaboration among clinicians, limited follow-up and monitoring, poor continuity of care and serious gaps in services as patients move between healthcare providers and across care settings. The purpose of this project was to explore transitional care as a patient-centered approach intended to improve transitions following discharge from acute hospital settings and involved the combination of a multidisciplinary team approach through post discharge phone calls and home visits to reduce readmissions, improve the quality of care and improve symptom management for adult patients with chronic diseases.

More than 90% of Americans over the age of 65 have at least one chronic disease with European countries showing similar numbers (Le Berre, Maimon, Sourial, Gueriton & Vedel, 2017). The coordination of care across the health care continuum is crucial to the implementation, management, and evaluation of a patient's treatment plan. Therefore, the transfer and receipt of patient information between different levels of care and locations should ensure continuity and promote successful treatment (Jackson, Kasper, Williams & Dubard, 2016; Rennke & Ranji, 2015). Unfortunately, breakdowns in these processes, as well as the ineffective handoff of information among care providers, is leading to poor transitions and miscommunication among providers (Coffey et al., 2017; Hirschman, Shaid, McCauley, Pauly & Naylor, 2015). This, in turn, is causing confusion regarding treatment plans, duplicative testing, discrepancies in medications, and missed healthcare provider follow-up, ultimately leading to fragmented care and patient dissatisfaction. Moreover, hospital readmissions may result from failures in communication as well as from poor coordination of services, incomplete treatment and incomplete discharge planning (Mansukhani, Bridgeman, Candelario & Eckert, 2015; Morrison, Palumbo & Rambur, 2016). As noted by Baldwin, Zook, & Sanford (2018), there is a lack of coordination and communication between hospitalists, other specialists and primary care practitioners (PCP). PCP's often do not receive discharge summaries and when they do receive them, the summaries often lack appropriate documentation of medication indication and advice for follow-up. It is therefore difficult for PCPs to plan an appropriate follow-up after hospital discharge.

To guarantee quality transitional care after a patient has been hospitalized, the transfer of accurate patient information from hospitals to independent practices is imperative to ensure that all patients receive strong continuity of care, following hospital discharges. Utilizing various

interventions such as phone calls and home visits is shown to enhance transitional care and bridge gaps in patient management during the transition from acute hospital care to home and community (Morrison et al., 2016). As evidenced by additional studies from Jackson et al., (2016) & Mansukhani et al., (2015), home visits and phone contacts identified changes in the patient's health status, managed and/or prevented declining health problems and included adjustments in therapy in collaboration with the patient's healthcare provider. In addition, various literature sources emphasized the significance of delivering a smooth transitional care process through effective coordination and communication between acute settings and healthcare providers by incorporating an appropriate follow-up strategy post discharge (Coffey et al., 2017; Son & You, 2015; Rennke & Ranji, 2015). High rates of preventable hospitalizations and ED visits are among the most burdensome consequences. In a recent Medicare Payment Advisory commission (MedPAC) report to Congress, all-cause 30-day rehospitalization rates for Medicare beneficiaries decreased from an average of 16.7 percent to 15.6 percent, at least in part due to major changes in incentives (MedPAC, 2019). However, among Medicare beneficiaries with four or more medical chronic conditions, the 30-day rehospitalization rate was 36% (Bindman & Cox, 2018; Finlayson et al., 2018; Huckfeldt et al., 2018).

Together these studies demonstrate that successful translation of a transitional care program that incorporates an in-person contact, communication through phone calls and a multidisciplinary team approach can effectively interrupt patterns of frequent rehospitalizations, reduce costs, and improve patient health status. On a whole, bridging the gap created in the transition of care is pliable to change, as it will improve care and satisfaction of patients whereby patients will be well informed of expectations post discharge from an acute setting and healthcare providers can address their pertinent issues during the follow up appointment.

Findings from these studies inform challenges that must be overcome to facilitate the translation of effective care management innovations into mainstream practice. Identifying the problem, issue or gap is beneficial in uncovering the root cause analyses and identifying practice strategies to improve care transitions and outcomes for this population.

An outpatient internal medicine primary care facility that treats and manages adult patients with common chronic medical conditions faced the challenge of having an efficient transitional care approach designed to prevent health complications and rehospitalizations of these chronically ill patients. The facility was committed to providing their patients with outstanding, efficient and effective health care in a compassionate and cost-effective manner. However, it reported at least two out of four patients were affected by inadequate practices post discharge from an acute setting. Among the 455 adult patients seen within a 3-month duration, 57% had five or more chronic conditions. Approximately 25% of these patients were admitted to an acute setting due to their chronic conditions and nearly 50% of these patients are affected by insufficient transitional care process and clinicians spent an extra 30 minutes during patients' follow up office visit to reconcile patients' discharge information and medications. Occasionally some of these patients were admitted at different acute care settings or hospitals and many of them were often discharged earlier in their recovery period with inadequate self-care instructions, poor management of the underlying problems, and poor multidisciplinary coordination. Transitional care of patients following discharge from an acute setting continuously posed an issue for this organization. This inquiry led to the PICOT question, in adults with chronic diseases (P) how does transitional care (I) compared to usual care (C) affect hospital readmissions, quality of life and symptom management (O) within 30 days of discharge from an acute setting (T).

### **Evidence Synthesis**

An extensive internet search was conducted using PubMed, Cumulative Index of Nursing and Allied Health (CINHAL), and PsychINFO databases available through the Arizona State University Library. Evidence examining transitional care interventions was investigated. A combination of search keywords and MeSH terms used included *adults, chronic diseases, elderly, geriatric, post discharge care, quality of life, readmissions, symptom management, transitional care, transitional care and hospital readmission, and transitional care management.*

Inclusion criteria were restricted to peer-reviewed English only articles with full text published between 2014 and 2019 with a focus on transitional care interventions targeting older adults with chronic diseases. To broaden the search of the strongest and most relevant evidence related to the research question, the reference list of key articles was also reviewed. The initial searches yielded 197 results. Review of article titles and abstracts were examined to determine its significance to the clinical question, and then hand searched which yielded 56 articles eligible for review. The use of phrases “transitional care,” “hospital readmission,” further narrowed the selection of articles. An analysis of abstracts and results eliminated duplication and articles that did not meet inclusion criteria. All adult populations were considered with emphasis on disease specific as well as more general chronic conditions or age-based populations were included. Pediatric and psychiatric focused populations were omitted, as it was not the envisioned population of study. A search of grey literature was conducted for background and significance and included position papers, practice guidelines, and quality improvement projects but again were excluded based on a low level of evidence and inconclusive results.

After screening for relevance and removing duplicates, 44 studies remained for further review. These 44 articles were then narrowed to 15 articles, which were critiqued with attention



to the following sections of each article: literature reviews, theoretical frameworks, designs, samples, data analyses, and authors' discussions. Each study was critically analyzed and an evaluation table of the pertinent details of each article was created (Appendix A). The final yield included 10 studies, which comprised of systematic reviews, meta-analysis, randomized controlled trials, and various quasi-experimental and cohort studies with and without controls.

The ten studies included in this literature review were all evaluated using Melnyk and Fineout-Overholt's (2015) rapid critical appraisal and hierarchy of evidence and are presented in evidence tables for analysis of data (Appendix A). In general, the strength of the studies was high, levels of evidence ranged from one to three: two systematic reviews (SR) and one meta-analysis (MA) for level one evidence; four randomized control trials (RCT) for level two evidence; and three various cohort studies: quasi experimental, descriptive and retrospective cohort studies for level three evidence (Appendix A). Apart from three of the studies, which denoted being funded by a grant from their research or project fund, minimal bias existed across studies. All studies had a clear conceptual framework to guide their work. Overall, the studies had large sample sizes with moderate heterogeneity. Though the SR's included studies from numerous countries that can signify a possible bias, the SR's were composed of all RCTs and they described measures to ensure quality and minimize bias. The meta-analysis models and methods to test for heterogeneity, including Chi square,  $I^2$  and Cochran's Q, varied but were all appropriately utilized. Sequential matching for comparison between groups in studies that were not randomized involved L1, Wald statistic, and Mahalanobis distance. Though there was moderate practical heterogeneity, a robust statistical and clinical homogeneity existed among the final ten studies evaluated (Appendix A).

Most of the studies were conducted in the US and settings varied from large hospital settings to smaller medical homes as well as one outpatient setting. The studies display a reasonable degree of demographic information and disease processes (Appendix B). The mean age of subjects was variable, ranging from 55-88 and most studies reported mean ages in the 70's with most of the subjects 65% primarily being women. All subjects in the studies included patients with at least one chronic disease and were at a high risk for readmissions. The majority of the studies focused on CHF, COPD, DM, and MI, while the rest of the studies targeted Medicare and Medicaid patients, older adults, or those with other chronic diseases (Appendix B).

Common themes identified across studies were benefits of transitional care programs, use of various care bundles or interventions in transitional care. The selected independent variables or interventions utilized were heterogeneous across studies but were categorized into several obvious groupings (Appendix B). Studies utilizing home visits were considered more robust, while telephone support was the next most frequently utilized intervention. Most studies utilized bundled interventions, although the RCT's in the SR's differed in approach by including components such as medication reconciliation, patient education or care coordination along with the main intervention. (Appendix B). All study interventions lasted at least 30 days, while several included prolonged interventions up to one year with the focus associated with reduction in readmission rates in the short, intermediate or long terms. Almost all the telephone calls and home visits were done by a nurse with supplementary workforce specialties such as social workers, nursing students, and pharmacists. Additionally, while there were no comparative studies among the ten retained to demonstrate effectiveness of one transitional care model over the other, except one study that categorized the interventions into high intensity and low intensity to determine the most effective intervention. The literature reviewed, and evidence synthesized

demonstrates that transitional care interventions are effective and can be feasible within the practice setting. Overall, the studies addressed the clinical question and compared transitional care interventions to standard care or no distinct intervention. Primary outcomes measured were homogeneous and interests mainly focused on hospital readmission, symptom management and quality of life (Appendix B). All ten studies identified at least one substantial outcome related to an intervention, and they measured and reported hospital readmission rates for common chronic diseases, with two stating an all-cause reason for readmission rates. All studies, even those concerning chronic diseases among the elderly patients looked at all-cause readmission rates at 30 days with additional outcomes measuring all cause readmissions at other periods varying from three months to one year. Secondary outcomes cited included ED visits, cost savings, mortality rates, self-efficacy and patient satisfaction.

Measurement instruments were heterogeneous and included self-completion of intervention questionnaires, interviews and telephone conversations. While the measurement tools varied, all studies directly assessed readmission rates as a dependent variable (Appendix A). Reliability and validity of evidence is implicit by utilizing standardized measuring tools for outcome evaluation and the production of statistically significant data. Most studies reported confidence intervals (CI), effect size, means, standard deviations (SD), and level of significance ( $p$ ). Most CI's were narrow with statistically significant  $p$  values indicating positive effects. All studies determine that single interventions, such as, telephone support, home visit, patient education and scheduling follow-up, are all likely to bridge the post-discharge gaps with congruent approaches on improving transitions of care and/or reduce readmissions. It is apparent that health care professionals continually develop programs to achieve specific goals in efforts to attain a desirable impact on patients' health and quality of life. Implications for practice change

included improving the outcomes of adult patients with chronic diseases by providing a comprehensive transitional care program to prevent rehospitalizations and equip patients to effectively manage their chronic disease.

Transitional care has demonstrated efficacy in reducing hospital readmission rates in chronically ill older adults and denotes the appropriate transfer of patients between practice settings and home. The evidence suggested that multifaceted, bundled transitional care are effective to reduce 30-day readmissions and necessary to substantially improve quality of life and patient care. However, as noted by Malley & Kenner (2016), insufficient data are available on whether and to what extent there is benefit beyond 30 days, and for populations other than Medicare beneficiaries. While the impact of a transitional care program is most notable during the 30-day post-discharge period, the effect continues to exist after 60- and 90-days post-discharge. Additional evidence from the literature also suggested a universal agreement on the content of the transitional care programs, developed as a resource tool to provide evidence-based interventions. Although the literature identified several transitional care programs that have been launched to reduce hospital readmissions and augment the quality of care, a gap exists in designing a program specifically for primary care facilities to facilitate a smooth transition.

### **Theoretical Framework and Implementation Framework**

Identifying effective strategies to improve care transitions and outcomes for adult patients with chronic diseases is essential. Healthcare providers are required to use evidence-based healthcare delivery models to improve outcomes for this population. *The Chronic Care Model* (CCM) (Wagner, 1998; Appendix C), translates a multifaceted framework of six interrelated fundamentals that provides an organizational approach to caring for people with chronic disease in a primary care setting. The elements that encourage high-quality chronic disease care are the

community, the health system, self-management support, delivery system design, decision support and clinical information systems. This model can be applied to an evidence-based project as it has proven to be effective in primary care by improving and sustaining patients' health care through transitional management programs (Yeoh et al., 2018).

Utilizing the CCM created a culture and mechanisms that promoted a safe, high quality care; assured the delivery of effective, efficient clinical care and self-management support; promoted clinical care consistent with scientific evidence and patient preferences; organized patient and population data to facilitate efficient and effective care; empowered and prepared patients to manage their health and health care needs; and mobilized community resources to meet the needs of these patients. The target population of patients is primarily composed of those with one or more chronic conditions, therefore the idea of employing this theoretical/conceptual framework presented a systematic way of guiding a scheme to concentrate on the necessities of adults with chronic illnesses and their transitional care needs. This created timely and practical data through clinical information systems, a supportive evidence-based interaction between an informed, active patient and a coordinated proactive care team. A practice that aims to provide an effective transitional care for its patients would need to integrate these fundamental areas to achieve better outcomes.

Translation of evidence into practice is a task for many health care settings. Regardless of the substantiation that reinforces the efficacy of health care programs, gaps exist between evidence-based everyday practices. The increased interest in transitional care to address readmission rates requires a thorough evaluation of existing evidence before developing a transitional care program. Hence, the appropriate selection of the right model was essential to demonstrate that the selected program created an impact. Utilizing the Larrabee (2009) model

for evidence-based practice change (Appendix D) was pivotal to assist in guiding this evidence into a sustainable practice change because it followed an evidence-based practice (EBP) process and involved phases to incorporate elements of change. This model was designed to guide practice change projects by incorporating six components which included assessing the need for change in practice, locating the best evidence, critically analyzing the evidence, designing the practice change, integrating and maintaining change in practice and then implementing and evaluating change in practice (Melnyk & Fineout-Overholt, 2015).

Upon initial assessment of the internal evidence obtained from the outpatient primary care practice setting, it appeared that an inadequate transitional care method was the basis of their frequently occurring mishap in delivering efficient patient care. The desire to support the development of a satisfactory transitional care program designed to address the challenges faced by the practice in decreasing readmission rates, preventing reimbursement delays as well as delivering effective patient care was the first step. Secondly the evidence from reviewed literature, critically analyzed and synthesized (Appendix A & B) supported the value of post hospitalization follow-up with a phone call and/or home visit. Developing the next steps utilizing the EBP model integrated the design phase through the interventions assessed, outcomes defined, the needed resources determined, and an implementation plan enacted. Next, the subsequent steps addressed the issue and provided a clearly measurable care of the highest quality change through an effective transitional care process. During the implementation step, potential resistors were noted, along with strategies for overcoming resistance. Currently, the last step is to integrate the change into practice by acknowledging the importance of educating all stakeholders and providers that will be affected by the change and evaluate the results of the change periodically and to address any modifications required to maintain its continuity.

### **Methods**

Several initial meetings occurred prior to start of the project site to get internal data and organize a team for the project. Focusing on the feasibility for the practice change as well as what is proven in the literature, a logic model was created (Appendix E), that presented the shared relationships among the resources, activities, outputs, outcomes, and impact for the project. A review and approval of the project was obtained from the Arizona State University Institutional Review Board (IRB) and the medical director and owner of the project site. The project was completed at an outpatient internal medicine primary care facility which serves patients with various chronic medical conditions including CHF, Diabetes, COPD and HTN. Twenty adult patients with one or more chronic disease such as CHF, COPD, DM and HTN as well as Medicare and Medicaid patients, discharged from acute settings consented to participate in the project. A one-page written consent/recruitment document in English was offered to the patient or caregiver, which contained information on tools to be used for project and patients' rights which indicated that agreeing to a post discharge contact means agreeing to be part of the project. For participants who did not speak or read English, a caregiver was required to translate to qualify for the recruitment process. Adult patients or care givers who were unable to consent were excluded from the project sample.

Transitional care was implemented within a 30-day period starting from day of discharge from acute setting. The project timeline was set for 16 weeks from the day of IRB approval. Key stakeholders were well informed, updated and involved from the start and throughout the process. Key concepts included transition care planning such as patients' hospitalization, medication reconciliation management, and scheduling a provider follow-up appointment. A collaboration involved clinicians, practice manager, patient care coordinators and medical

assistants within the practice to initiate transition care planning 24 to 72 hours post inpatient discharge through follow up phone calls only or phone calls and home visits. The Care Transitions Measure (CTM<sup>®</sup>, Appendix G), a 15-item uni-dimensional measure and the Medication Discrepancy Tool (MDT<sup>®</sup>, Appendix H), developed by Coleman et al., (2002) were utilized to determine the need for more than the usual care of routine post hospitalization follow up visit. Permission was obtained from the primary author to use this instrument. This additional care included phone calls to the patient, and some home visits to ease the transition from hospital to home and to decrease the incidence of ED visits or re-hospitalizations within 30 days of discharge.

The project commenced with a notification to the project coordinator from the medical assistants (MA) at the project site of a patient admission to an acute setting. The patient was seen by the project coordinator within 24 hours to establish a relationship, explain the purpose of project, provide a brief background and the significance of project, inform of intent/purpose of post discharge contact and obtain consent. Upon discharge, a notification was received from the MA to contact the patient at home or discharge location within 24-72 hours. The first contact was a phone call to patient to complete the questionnaire as well as two subsequent follow up phone calls if unable to reach the patient within the 24-72 hours. The CTM and the MDT questionnaires used during the phone interview measured and assessed the quality of care transitions, identified and addressed medication discrepancies that were of concern. This was through a 4-point Likert-type format which measured responses ranging from 1 (strongly disagree) to 4 (strongly agree). Different codes were assigned to missing responses, and to Don't Know/Don't Remember/Not Applicable responses which did not contribute to the overall CTM<sup>®</sup> score of 60. The estimated time required to complete the questionnaires was



approximately 10 to 15 minutes, while additional time was provided to answer any questions the patient/caregiver had regarding the discharge and transitional process. Moreover, the patient's response to the questionnaires based on the score during the phone call determined the inclusion or exclusion of a home visit, which was offered to the patient. A CTM score of 24 points or less using the Likert scale based on questions 1-12 determined if a home visit was needed, whereas a CTM score of 6 or less based on the medication reconciliation questions 13-15 triggered the use of the MDT questionnaire.

A home visit occurred within 24-72 hours after the phone interview and focused on concerns noted during the phone interview. Apprehensions were conveyed to the PCP at project site. In addition, a post discharge follow-up appointment with their PCP was scheduled. The CTM®-15 scoring protocol (Appendix I), was used to perform a Rasch analysis on survey data to convert ordinal numeric results from the Likert scale into an interval score from 0 to 100 to help provide statistical results.

To evaluate the effectiveness of the intervention, project outcomes included the scores from the CTM & MDT, if a home visit was required, ED visits and re-hospitalizations within the 30-day period as well as the reason for the ED visit or re-hospitalization. Additionally, a chart audit tool (Appendix J) was utilized for data collection during the interventional process. Participants were identified only by a project ID number on the chart audit tool. Data collected consisted of the age of the participant, gender, phone call and/or home visit, diagnosis/reason for the initial hospitalization, the CTM score, and any ED visits or re-hospitalizations within 30 days of initial discharge and the reason for the ED visit or re-hospitalization.

A budget plan (Appendix F), developed showed the estimated total cost for a 3-month budget proposal for a pilot program would be \$4405.00. Initial funding for this project was

managed and implemented solely on in-kind donations. The operating costs for this 16-week project was provided by the project site practitioners and individual team members who donated their time to the project. The project coordinator incurred other costs such as travel to participants' home and cost of business cards.

### Results

Outcomes to be measured for practice change focused on ED visits and hospital readmissions, medication adherence and reconciliation within the 30-day post discharge period. The Intellectus statistics program (Appendix K), was utilized to analyze and interpret descriptive statistical data. The outcome indicated that developing a transitional care program in primary care utilizing evidence-based transitional care practices was beneficial in reducing readmission rates in chronically ill older adults within 30 days of discharge. The outcomes were analyzed over the 30- day period through data collected by the using the chart audit tool. Fourteen participants received only phone calls (72.2%) and 6 received both phone calls and a home visit (27.8%). All the participants were Caucasian (100%) and were mainly female (76.3%). The average age was 72.5 years with ages ranging from 55 to 90. However, the average age for a home visit was 83.50 ( $SD = 5.24$ ), with a minimum age of 76 and maximum age of 89. The average age for phone calls was 68.86 ( $SD = 12.33$ ) with a minimum of 55 and a maximum of 90. For those who received home visits, the most frequently observed diagnoses included CHF and DM, each with an observed frequency of 2 (33%). For phone calls, the most frequently observed diagnosis was CHF ( $n = 4$ , 29%). This depicts the vulnerability of older adults with chronic diseases and how ineffective care transitions can be detrimental to their health. Therefore, the phone interview and/or home visit identified a national patient safety goal to ideally recognize problems before patients experience them.

CTM scores were obtained from all 20 participants and calculated based on the Likert scale with a total of 60. This 15-item CTM scale demonstrated an inter-item Spearman correlation range from 0.388–0.594 based on the a 4-point Likert-type format. A Binary logistic regression showed overall model significance,  $p = .002$ , suggesting that the CTM score had a significant effect on utilizing either a phone call or home visit indicating the quality of either intervention in achieving expectations. In addition, the CTM scores reflected the overall quality of the care transition from acute setting to home, with lower scores indicating a poorer quality transition, and higher scores indicating a better transition. Moreover, a Pearson correlation analysis showed that as age of participants increased, the CTM score decreased, indicating that older adults required more support during the transitional period.

Further data analysis showed a less proportion of ED visits and rehospitalizations. The result of the two proportions z-test calculated based on the internal evidence received prior to starting the project was equally significant  $p < .001$ , suggesting that the proportion of readmission rates before the intervention was significantly higher than the proportion of readmission rates after the intervention. Out of the 20 participants, for home visit, the most frequently observed category of 30-day readmission rate was 0 ( $n = 6, 100\%$ ) and for the phone calls was 0 ( $n = 12, 86\%$ ). Only 3(15%) participants had an ED visit and were hospitalized.

Overall, the project outcome showed a clinical impact where there were less medication discrepancies, improved patient satisfaction and quality of care based on the phone interview and CTM scores. This is apparent that the evidenced based interventions used determined the possibility of reducing readmissions among older patients as well as a measure that is both substantively and practically consistent with the concept of patient-centeredness, and useful for the purpose of performance measurement. This project reveals that outcome measurement of transitions in care using a

reliable and valid instrument presents a new insight for providers, influences organizational changes and environmental system factors that either contribute or confound the quality of transitions in care. Moreover, the evidence notes that healthcare providers using evidenced based practices and the appropriate tools can bridge the gap in transition related issues. It is expected that these outcomes will model and facilitate new behaviors, skill transfer, and communication strategies for patients and families to build confidence that they can successfully respond to common problems that arise during care transitions.

A successful transitional care program will depend on team collaboration to inform practice through delivering a smooth transitional care process. In order to integrate the change into practice, it will be vital to acknowledge the importance of educating all stake holders and providers as well as medical assistants and receptionists that will be affected by the change to continue to measure and evaluate the results of the change periodically to address any modifications required to maintain its continuity. The changes are essential to continue to justify a care coordination team to assist transitional practices within the practice. Also a potential revenue or cost savings to practice site can include money saved through reduction in time burden for the primary care providers at the post discharge follow up face-to-face patient visit, the prevention of readmission of the patient in a 30-day period, reduction in the use or duplication of ancillary procedures because early diagnosis prevented exacerbation or complications of the disease, and an increase in the rate of patient satisfaction. Currently transitional care management accounts for all the services that primary care providers deliver during the 30-day post-discharge period and this is billable by using appropriate codes (CMS, 2020). Given that readmission rates occur at a higher rate in patients with chronic illnesses, it is important for practitioners and policy makers to understand the financial implications of

readmission reduction and sustain transitional care programs. An estimated a 50–66% savings could be saved based on Medicare estimates that transitional based care has total health care costs averaging \$5,000 less than the usual costs with no transitional care interventions (HHS, 2016). As need dictates, the practice site is well vested and willing to aide in the sustainability of the program by continuing.

### **Discussion**

Improving transitions of care is significant as primary care providers play a key role in the transition and continuity of care for elderly patients with various chronic diseases transitioning from the inpatient settings to the home. In addition, the outcome proposes that, the collaboration and coordination of multidisciplinary interventions conducted in a primary care setting can facilitate transitional care post discharge from acute care settings. It is apparent that a patient-centered timely and effective transitional care intervention using EBP such as phone calls and home visits and education can reduce readmissions, bridge gaps, prevent complications and improve healthcare outcomes for adult patients with chronic diseases. A patient-centered intervention that focuses on transitional care through phone calls and a home visit have shown promising results in reducing hospital readmissions and these interventions have been evident in both randomized control trials and in real-world open healthcare delivery systems (Henke, Karaca, Jackson, Marder, & Wong, 2017).

The reliability and validity of evidence is implicit that utilizing standardized measuring tools for outcome evaluation and the production of statistically significance is relevant. In addition, the efficacy was proved through enrolling patients with identified risk factors, and engaging intervention questionnaires, telephone conversations and home visits. According to Rustad, Furnes, Cronfalk & Elin (2016), a measurement tool that captures the essential domains of successful transitions across care

settings is the first step in improving transitions in care. The project was successful in reducing 30-day hospital readmission rates and utilizing these tools for this transitional care program assisted with the innovation and development of interventions needed to ensure high quality care. Efforts in defining the process indicators from the patient's perspective during both interventions identified the gaps that were present in existing measures of care transitions and brought clarity to the information that was required for a successful transition in care to occur.

As noted by Finlayson et al., (2018), the most important transitional care components such as phone calls and home visits, and also easing the time burden on providers requires standardized provider meetings to address the need to increase evidence-based services, mainly home visits. Although the findings suggest that an effective transitional care intervention is crucial in a primary care setting, there is a disparity in designing a program specifically for primary care facilities. Some of the staff delayed in notifying of admissions and discharges mostly due to busy practice schedule and patient complaints. Some patients had more concerns which required a lengthy phone call and longer than anticipated home visit. The suggestion of enacting a team to increase feasibility of more home visits is recommended especially for those patients at highest risk. Moreover, audits can be conducted of patient calls to ensure consistency and more resources should be provided for patient education with an included requirement to discuss self-care measures. In addition, a successful program in practice settings will serve as a model for analyzing functioning where gaps in their processes are affecting performance and analysis can then be used to recommend evidence-based practice changes.

In summary, features of effective transitional care programs include but not limited to comprehensive care bundles such as telephone follow-up, home visit, self-care support and education. For patients discharged home from an acute care setting, a complete discharge support

and education that includes a timely follow-up with health care providers can be essential to a successful transition. Paramount to patient goals can be dependent on relationships built between the patients and their primary care provider. A prearranged telephone call supplemented with a home visit confirms patient's continued progress toward established goals. Positive support and reassurance are also vital by a scheduled follow up visit post discharge. This transitional care program will assist elderly patients with chronic diseases to successfully transition from the hospital setting to home after an inpatient admission. The envisioned outcome of these changes will be improved patient outcomes evidenced by reduction of readmission rates, ED utilization, reduce the time burden for the primary care providers at the post discharge follow up face-to-face patient visit, higher quality of service, and improved communication with other providers within the practice and other settings. It is of the notion that providing a timely and effective transitional care intervention in a primary care setting can reduce hospital readmission, improve symptom management and quality of life during at 30-day readmission evaluation. Further studies should include medication reconciliation, self-care support, education and a 60-day readmission rate evaluation, but not limited to telephone support and home visit. A complete discharge support and education that includes a timely follow-up with health care providers can be essential to a successful transition.

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Appendix A

Table 1  
Evaluation Table

Citation	Theory/Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
<p>Baldwin et al. (2018) Implementing posthospital interprofessional care team visits to improve care transitions and decrease hospital readmission rates</p> <p><b>Country:</b> US</p> <p><b>Funding:</b> Practice setting grant for project</p> <p><b>Bias/Conflicts:</b> Authors are employees of PC practice setting</p>	<p>Interprofessional care team model</p>	<p><b>Design:</b> RCT</p> <p><b>Purpose:</b> To employ an interprofessional care team (ICT) to improve transitions of care posthospital, for complex care patients</p> <p><b>Intervention:</b> ICT to collaborate and ensure safe and effective TCI from hosp. to home by utilizing post hosp. f/u clinic (DC. Clinic) for pts w/ complex conditions and multiple comorbidities, requiring higher utilization of acute</p>	<p>n= 75 IG - 40 CG- 35</p> <p><b>Setting:</b> The posthospital Discharge Clinic in California via direct contact and/or telephone.</p> <p><b>IC:</b> Pts aged &gt;18 yrs DC from acute care setting with complex MCD's requiring higher utilization of acute care post hospital DC</p> <p><b>EC:</b> Pts not affiliated with PC setting.</p>	<p>IV: ICT (TS, HV, MEDR, F/U, EDU)</p> <p>DV: RR</p>	<p>ICT (FNP, a clinical pharmacist, a NCM, and a social worker performed the study selection, data extraction and assessment of study quality. At each step, any disagreement was resolved by consensus</p>	<p>Standard descriptive, parametric &amp; nonparametric analyses used to differentiate gap between acute care and PC transitional services</p>	<p>DC Clinic project participants achieved a 30-day readmission rate of 2.7%.</p> <p>DC Clinic's estimated impact in reducing RR at 9.63% and an estimated savings of \$689,199.84</p> <p>Only two pts enrolled in project were readmitted within 30 D of hospital DC</p>	<p><b>LOE: II</b></p> <p><b>Strength:</b> Acute care and PC formed collaborative relationships to bridge gap in TC. Ensured safe and effective transitions of care from hospital to home. Decrease 30-D hospital RR.</p> <p><b>Weakness:</b> Small sample size; One PC location.</p> <p><b>Conclusion:</b> Significant decrease in RR compared with national benchmark data.</p> <p><b>Feasibility:</b> The Discharge Clinic serves as an innovative model that health systems throughout the country can replicate to improve transitions of</p>

**Key:** AA – African American; AC– all cause; ACF – Assisted care facilities; a/f- after; ANOVA- analysis of variance; ARR – absolute risk reduction; b/f-before; C – clinic; CC- care coordination; CG – control group; CFIR-consolidated framework for implementation research; CD- chronic disease; CLD- chronic liver disease; CNS- clinical nurse specialist; CRF- chronic renal failure; CTS-care transition solution; CV- cardiovascular; D – days; dc- discharged; DC – discharge; DDMP - designated disease management program; DM- diabetes mellitus; DV-dependent variable; EC- exclusion criteria; ED – emergency department; EDU – education; ETOH- alcohol detox; f – female; FNP- family nurse practitioner; FT- full time; F/U – follow up; Hosp- Hospital; HV – home visits; IC – inclusion criteria; ICT- interprofessional care team; IG – intervention group; IRR - incidence rate ratio; IS- inpatient services; ISF- interactive systems framework; IV – independent variable; L- level; LOE – level of evidence; LSD- least significant difference; m- male; M- mean; MCD- multiple chronic diseases; MDS – multidisciplinary; MEDR – medication reconciliation; MLHF- Minnesota Living with Heart Failure questionnaire ; MMSE - mini mental state; mos- month; N – number of studies; n – number of participants; NCM- nurse case manager; NS- nursing student; NNT- number needed to treat; OS- outpatient services; OR – odds ratio; PC- primary care; PCC- physicians specializing in palliative care; PCP – primary care provider; PRAiHS- promoting action on research implementation in health services; Post/I- post intervention; Pre/I- pre-intervention; pt- patient; pts – patients; QOL – quality of life; RCT – randomized controlled trial; resp- respectively; RE – readmissions; rt/o- related to; RR- readmission rate; sig- significant; SW- social worker; TC – transitional care; TCI – transitional care interventions; TCM- transitional care management; TCP – transitional care program; TF- time frame; TS – telephone support; UKDFCM- University of Kentucky Residency for the Department of Family and Community Medicine; wk- week; w/- with; w/o- without; 1<sup>0</sup> – primary; 2<sup>0</sup> secondary.

		care services.						care for complex patients.
Citation	Theory/Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Ballard et al. (2018) Effect of ambulatory transitional care management on 30-day readmission rates.  <b>Country:</b> UK  <b>Funding:</b> No grants  <b>Bias/ Conflicts:</b> Only TCM-eligible patients from July 2014 through December 2015 allowed in the study.	Transitional Care Model	Retrospective cohort study  <b>Purpose:</b> To determine the relative efficacy of primary care-based TCM in reducing 30-day RR.  <b>Intervention:</b> Mixed methods of TCM (TS, HV, MEDR, EDU, F/U) via direct contact, telephone, or electronic with primary outcome variable to reduce RR within 30 D. CC by a FT TCM RN.	n = 1884 <b>L1:</b> No TS & OS n = 597 (31.7%) <b>L2:</b> 48-hr TS but no OS visit n = 237 (12.6%) <b>L3:</b> w or w/o 48-hr TS, OS >14 D; n = 85 (4.5%) <b>L4:</b> No 48-hr TS, OS ≤14 D; n = 470 (24.9%) <b>L5:</b> Full TCM, inc. 48-hr TS & OS visit ≤14 D; n = 495 (26.3%) <b>M</b> age: 52.9 years  <b>Setting:</b> Outpatient practice site of a 302-bed community hospital for the UKDFCM in Lexington, Kentucky.	IV: TCM (TS, HV, MEDR, EDU, F/U)  DV1: No TCM components (TS & OS)  DV2: Pts had 48-hr TS, but no OS visit post DC  DV3: Pts had an OS visit beyond 14-day TF.  DV4: Pts had all TCM services (as per Medicare guidelines) but no post DC 48-hr TS	TCM tracking spreadsheet, EHR & scheduling software. Standardized TCM visit templates. Pt schedulers coordinating TCM visits.	Standard descriptive, parametric & nonparametric analyses ( $\chi^2$ ) used to evaluate differences in cohort characteristics ANOVA (Pt age × Cohort)  LSD (post hoc analyses)  Logistic regression	30 D RR (%): 70 (3.7%) $p \leq .005$  L1: 31 (5.2%) $p = .05$ L2: 15 (6.3%) L3: 3 (3.5%) L4: 7 (1.5%) L5: 14 (2.8%) L3-L5 $p \leq .001$ The greatest proportion of the 30 D RR were incurred by L1(no TS & OS visit) & L2 (TS but no OS visit). Together, these 2 cohorts	<b>LOE:</b> III  <b>Strengths:</b> large sample size, real-world conditions, and standardized TCM implementation throughout the study period. Instigating a TCM program in a primary care setting can reduce RR.  <b>Weakness:</b> Complete pkg of TCM components as defined by Medicare guidelines may not be required to achieve a reduction in RR.  <b>Conclusion:</b> TCM programs benefits high-risk pts, such as older adults with MCD, via targeted CC to reduce RR.  <b>Feasibility:</b> Valuable to PC practices, managed care entities when

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			<p><b>IC:</b> Pts aged &gt;18 yrs dc from the affiliated IS and/or desired to become a pt at the UKDFCM OS. <b>EC:</b> Pts DC against medical advice, admitted solely for ETOH w/o MCD.</p>	<p>DV5: Pts received full TCM services</p>			<p>comprised 44% of the population but incurred 66% of the RR.</p>	<p>considering implementing a TCM program/services. Useful to policy makers and hospitals interested in Medicare-prescribed TCM requirements for payment in reducing 30-D hospital RR.</p>
<p><b>Citation</b></p>	<p><b>Theory/Conceptual Framework</b></p>	<p><b>Design/ Method/ Purpose</b></p>	<p><b>Sample/ Setting</b></p>	<p><b>Major Variables &amp; Definitions</b></p>	<p><b>Measurement/ Instrumentation</b></p>	<p><b>Data Analysis (stats used)</b></p>	<p><b>Findings/ Results</b></p>	<p><b>Level/Quality of Evidence; Decision for practice/ application to practice</b></p>
<p>Hamar et al. (2016). Impact of a scalable care transitions program for readmission avoidance</p> <p><b>Country:</b> US</p> <p><b>Funding:</b> Healthways, Inc</p> <p><b>Conflicts/Bias:</b> Most of the authors are employees/stock holders of Healthways, Inc, which is the vendor of the Care</p>	<p>Chronic Care Model</p>	<p>Quasi-experimental retrospective cohort study <b>Purpose:</b> Evaluate impact of the Care Transition Solution on pts DC with a MCD (HF, MI, COPD, PNA)  <b>Intervention:</b> Identification of high RE-risk pts, assessment of individual needs, MEDR, dc planning, CC, TS (4 calls over 4</p>	<p>n=3900  IG=560 CG= 3340 Mean age = 59.3  <b>Setting:</b> 14 acute care hospitals in Texas</p>	<p>IV: TCI (MEDR, CC, TS)  DV1: AC-RR 30 D  DV2: AC-RR 6 Months</p>	<p>To determine readmissions, hospital admission records were assessed from each subjects index admission to the study end date</p>	<p>Zero-inflated Poisson multivariate models used to estimate intervention effects  Coarsened exact matching used for IG/CG comparison: L1 and Wald statistics</p>	<p>AC-RR 30 D: IRR (incidence rate ratio) 0.75, P =0.01  AC RR 6 Mo: IRR 0.78, P &lt;0.01 IG: 0.47 (0.35-0.65) CG: 0.56 (0.41-0.77) IG risk of RE 22% lower over 6</p>	<p><b>LOE:</b> III</p> <p><b>Strength:</b> TCI may be scalable, individualized to pt needs and risk level, relatively low intensity TCI utilizing TS and other CC services</p> <p><b>Weakness:</b> Was a hospital implemented intervention with possible bias</p> <p><b>Conclusion:</b> Participation in the CTS resulted in significantly lower RR among pts with RE-</p>

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Transitions Solution		weeks)					mo. period and 25% lower over 30 D period	sensitive conditions, offering a scalable and sustainable approach to reduce the number of preventable hospital RR.  <b>Feasibility:</b> A scalable care transitions program has a potential to be used in healthcare based on the sig. low RR
Citation	Theory/Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Jackson et al. (2016). Incremental benefit of a home visit following discharge for patients with multiple chronic conditions receiving transitional care.  <b>Country:</b> US  <b>Funding:</b> North Carolina Healthcare Quality Alliance and the NC Department of Health and Human Services  <b>Bias:</b> 2 of the authors	Chronic Care Model	Retrospective cohort study  <b>Purpose:</b> Examined whether home visits reduced the odds of 30-day RE compared to less intensive TCIs  <b>Intervention:</b> All pts received some degree of TC management support (early coordinated f/u with PCP, MEDR, and pt/caregiver	n= 27,706 IG=7,468 Mean age=38 f= 60% AA= 43%  IC: Non-dual Medicaid recipients with multiple chronic conditions enrolled in medical home in North Carolina	IV: TCIs (including HV)  DV1: AC-RE 30 D  DV2: Total inpatient admissions  DV3: Total Medicaid costs per member per mo. over the 6-month period	Readmission and admission identified through claims analysis during period of study For comparison, patients stratified based on RR risk using Clinical Risk Group	Multiple logistic regression analysis	AC RE 30 D: 0.52 (0.48– 0.57) P<0.001 Avg. monthly cost difference \$970, Chi-square = 14.94, p< 0.001 HV sig. reduced the odds of RE within 30 D; At 6 mos, HV associated	<b>LOE:</b> III  <b>Strength:</b> included HV in a TCI as adding HV reduced RR  <b>Weakness:</b> Medicaid, not Medicare patients  <b>Conclusion:</b> For complex chronic pts, HV reduced the likelihood of a 30-day RR by almost half compared to less intensive forms of nurse-led transitional care support. Higher risk patients experienced the greatest

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are employees of Community Care of North Carolina (the setting of study)		EDU);  IG also had HV with a nurse care manager		following DC			with lower total costs and reduced total admissions for highest risk pts	benefit in terms of number of inpatient admissions and total cost of care in the 6 mon following DC  <b>Feasibility:</b> Highly efficient and appropriate to be utilized in pts w/ multiple CD's.
Citation	Theory/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Le Barre et al. (2017). Impact of transitional care services for chronically ill older patients: A systematic evidence review  <b>Country:</b> Europe: 38 (UK-7; Spain- 7; Denmark - 4; Sweden- 4; Italy- 3; Netherlands- 3; Germany- 2; Austria-2; Belgium-1; Finland- 1; Ireland-1; Slovenia-1; Switzerland-1) North America: 32 (USA- 27; Canada-5) Oceania:16 (Australia-15; New Zealand-1) Asia: 6 (Hong Kong-4; China-1; Japan-1)  <b>Funding:</b> Canadian	PRISMA CFIR	<b>Design:</b> Systematic Review.  RCT's in English identified through Medline, CINHAL, PsycINFO, EMBASE (1995–2015).  <b>Purpose:</b> To determine the effectiveness of TCI from hospital to the PC setting for chronically ill older patients  <b>Intervention:</b> TCI	N= 92 <b>M</b> age: 73.8 (4.8) f- 47%  <b>IC:</b> Pts > 65 yrs w/ at least one CD who have been hospitalized and being DC back to home. CD including RA, Cancer, COPD, DM type 1 or 2, CHF, CAD, HTN, CLD, CRF, Dementia or cognitive impairment and other multiple	IV: TCI (CC, HV & TS)  DV1: AC-RR  DV2: AC-mortality  DV3: AC-ED visits  DV4: AC-QOL  All reported at 1, 3, 6, 12, 18 and/or 24 months.	Two independent reviewers performed the study selection, data extraction and assessment of study quality. At each step, any disagreement was resolved by consensus.  Minnesota Living with Heart Failure questionnaire (MLHF) for QOL.	Cochrane “Risk of Bias”. Risk differences (RD) and number needed to treat (NNT) Mean differences (MD) were calculated using a random-effects model	DV1: 3 mos (RD: -0.08; NNT: 7), 6 mos (RD: -0.05; NNT: 20), 12 mos (RD: -0.11; NNT: 9), 18 mos (RD: -0.11 (NNT: 9). No sig. change at 1 mos  DV2: 3 mos (RD: -0.02; NNT: 50). 6 mos (RD: -0.02; NNT:	<b>LOE:</b> I  <b>Strength:</b> Good methodological quality with 53 RCTs adequately explaining their sequence generation process, 40 RCTs describing blinding of outcome and 38 RCTs reporting some level of allocation concealment.  <b>Weakness:</b> QOL had the highest risk of bias in terms of incomplete data (≥20% without follow-up data).  <b>Conclusion:</b> TC for older

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<p>Institutes of Health Research</p> <p><b>Bias/Conflicts:</b> Funnel plots showed no systematic asymmetry versus the logarithm of the RD (data available upon request). Small sample bias shown in plots for mortality at 12 and 18 mos and for ED visit at 6 mos.</p>		<p>comprising of CC, F/U (HV &amp; TS) starting within 30-days post-DC</p>	<p>CD's.</p> <p><b>EC:</b> ETOH, spinal cord injury, MI, hip fracture, depression &amp; stroke as often directed to a rehabilitation center at DC</p>				<p>50), 12 mos (RD: -0.04; NNT: 25), 18 mos (RD: -0.07; NNT: 14).</p> <p>DV3: 3 mos (RD: -0.08; NNT: 13). No sig. change observed at 1, 6, and 12 mos.</p> <p>DV4: No significant differences observed MLHF total score, 2, 3, 6, and 12 mos.</p>	<p>pts w/ CD DC from hospital to home leads to better outcomes in mortality and RR. TC improves transitions for older pts and should be included in the reorganization of healthcare services</p> <p><b>Feasibility:</b> Stake holders, Decision-makers, managers and clinicians can employ these results when developing policies and interventions for older pts.</p>
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
<p>Morrison et al. (2016) Reducing preventable hospitalizations with two models of transitional care</p>	<p>Transitional Care Model</p>	<p>Retrospective descriptive study</p> <p><b>Setting:</b> CNS- small rural community hospital</p>	<p>n= 98 CNS program (Sept 2014 to Dec 2014) M age 69 yrs. f- 65%</p>	<p>IV: TCM (HV) DV1: CNS DV2: PPC</p>	<p>Pts' age and sex were collected. The outcome variables examined were the number of</p>	<p>CNS-2<sup>0</sup> analysis of existing data was performed.</p>	<p>DV1: RR /pt Pre/I- 1.03 Post/I- 0.21 M ED visits P/I 0.93 Pt/I 0.22.</p>	<p><b>LOE: II</b></p> <p><b>Strength:</b> CNS program significant decrease in ED visits, compared to PPC program. Efficient CC</p>

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<p><b>Country:</b> US</p> <p><b>Funding:</b> No grant</p> <p><b>Bias/Conflicts:</b> CNS used a comprehensive assessment applied to each pt and a standardized visit schedule, the PPC program left the assessment and visit schedule open to their discretion</p>		<p>PPC- an academic medical center in the principal city of a metropolitan area in a small rural state.</p> <p><b>Purpose:</b> To determine a model of health care designed to decrease preventable adverse events and associated utilization of health care through temporary f/u after hospital DC.</p> <p><b>Intervention:</b> Utilizing two distinct TC programs by master's-prepared clinical nurse specialists (CNS) with a CD self-management focus &amp; physicians specializing in palliative care</p>	<p><b>IC:</b> Chronic disease; rural population</p> <p><b>EC:</b> Pts with severe dementia, behavioral health as primary diagnosis, those w/ no risks for rehospitalization, Pts in long-term care facility. Pts who died before the end of 120-D period</p> <p>n=71 PPC program (Sept 2014 to April 2015) M age 81 yrs. F- 63%</p> <p><b>IC:</b> Palliative care; urban population <b>EC:</b> 30 participants who died within 120 D</p>		<p>hospitalizations and ED visits 120D b/f and a/f interventions began.</p> <p>PPC collected data regarding date of death; data collected over longer period due to fewer participants in the program at a given time</p>	<p>PPC- a r/v of pt charts was done to collect data on encounters.</p> <p>A Wilcoxon matched-pairs signed-rank test was performed to test for significance.</p> <p>Means were reported rather than medians due to several medians being zero.</p>	<p>Sig. fewer RR and ED visits (p &lt; .005)</p> <p>DV2: RR/ pt Pre/I- 0.72 post/I- 0.34</p> <p>Nonsig. reduction in ED visits (p = .327) and a sig reduction in hospitalizations post/I (p=.03).</p>	<p>from CNS program Developed skill sets by CNS in TCM.</p> <p><b>Weakness:</b> No data on cost reported; absence of an RCT design, and wide variety of differences between the two programs and their pt populations limits a direct comparison of its effectiveness</p> <p><b>Conclusion:</b> Both TC programs have a potential in decreasing rehospitalizations. However, CNS intervention sig. reduced ED visits for their target population</p> <p><b>Feasibility:</b> Shows the potential for a variety of TC programs to decrease unnecessary exploitation of health care at the critical periods of transition that leave pts susceptible to adverse events and poor outcomes</p>
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<p>Roper et al. (2017). Systematic review of ambulatory transitional care management (TCM) visits on hospital 30-day readmission rates.</p> <p><b>Country:</b> US</p> <p><b>Funding:</b> None</p> <p><b>Conflicts/Bias:</b> None</p>	<p>PICOTS (populations, interventions, comparators, outcomes, timing, settings) framework</p>	<p>Systematic review</p> <p><b>Purpose:</b> Evaluate evidence for establishing effectiveness of Medicare TCM bundle on RR of adults in the US health care system</p> <p><b>Intervention:</b> TC models to reducing RR were included in the first screening set. The 30-day TCM period began on the date the beneficiary is DC from the inpatient hospital setting and</p>	<p>N=3 (1 observational quality improvement with cohorts; 1 observational retrospective analysis; 1 observational nonrandomized quasi experiment)</p> <p>IC: Incorporated all required elements for TCM service</p> <p><b>Setting:</b> 2 large hospital systems, 1 smaller university practice</p>	<p>IV: Intervention involving all TCM requirements</p> <p>DV: AC-RR 30 D TCM requirements: Pt communication within 2 D, face to face provider visit in 7-14 D, MEDR, other services such as EDU, referrals, and community services</p>	<p>Utilized IOM’s Standards for Systematic Reviews; 3 stages of review to identify studies that utilized a fully reimbursable TCM approach</p>	<p>Rate of change in 30D RR. Utilized LACE scores (a validated measure incorporating Length of stay, Acute admission through the ED, Comorbidities, and ED visits</p>	<p>Study 1: hazard ratio 0.78 (TCM) versus 1.0 (no-TCM) p&lt; .001; 8.87% reduction in 30 D RE (16% reduction for highest risk group)</p> <p>Study 2: 20% reduction in RE</p> <p>Study 3: 19.9% reduction in RE, P= 0.02</p>	<p><b>LOE:</b> III (SR of level III-IV studies)</p> <p><b>Strength:</b> TCM (as directed by CMS) approach has been studied (though not widely) and has shown promising reductions in RE rates</p> <p><b>Weakness:</b> Study 1- Medicaid pts; study 3- mean age 43; 2 of 3 in large hospital settings, not primary care setting</p> <p><b>Conclusion:</b> TCM programs is pivotal to meet its intended goal of reducing avoidable hospital readmissions and addressing the greater</p>

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		continues for the next 29 days  <b>EC:</b> Studies were excluded at the second stage of review if they failed to follow all aspects of the required procedures to qualify under the CPT-coded criterion for a TCM visit.						needs of the chronically ill.  <b>Feasibility:</b> Study has potential for utilizing a variety of TC programs in improving patient centered outcomes.
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Stranges et al. (2015). A multidisciplinary intervention for reducing readmissions among older adults in a patient-centered medical home.  <b>Country:</b> US  <b>Funding:</b> None  <b>Conflicts/Bias:</b> an author attended	Patient Centered Medical Home Model	Retrospective Cohort Study  <b>Purpose:</b> Evaluate the effectiveness of MDS practice model with medical providers, pharmacists, and SW on reducing 30-D AC-RR  <b>Intervention:</b> pharmacist call for MEDR in 2-4 D;	n=1144  IG = 572  IC: Adults > 60 yrs old DC from a large academic medical center	IV: TCI (MEDR, early f/u with PCP/SW, HV)  DV1: AC-RR 30 D  DV2: time to RR	Identification of variables, outcomes, and TCP appointment status was completed using the health system’s clinical data repository and systemwide scheduling system	DV1: Logistical regression  DV2: Kaplan-Meier and log rank tests for statistical analysis CG and IG were matched using Mahalanobis distance based on criteria of	Intention to treat 21% vs 17.3% (CG); P = .133  As treated 11.7% vs 17.3% (CG), P <.001  Time to RR: 8 ± 9 days compared with 12 ± 9 days with	<b>LOE:</b> III  <b>Strength:</b> large sample, setting similar to PICOT, utilized intensive TCI  <b>Weakness:</b> majority of pts scheduled to complete intervention, did not. Intention to treat analyses were not significant. RR were sig. reduced for those completing the intervention;

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meetings and is on formulary committee for a large insurance company		clinic f/u in 1 wk with PCP/SW then 3 mos. of HV and intensive f/u				age, sex, race, length of stay, number of medications at dc, and comorbidity index scores	usual care; P = .015	<b>Conclusion:</b> RR were significantly reduced. Findings describe the potential impact of MDS transition-of-care interventions in reducing RE in a highly vulnerable patient population.  <b>Feasibility:</b> A community-based multidisciplinary TC program may reduce hospital readmissions among older adults
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Verhaegh et al. (2015). Transitional care interventions prevent hospital readmissions for adults with chronic illnesses.  <b>Country:</b> 11 US 3 Hong Kong 2 Australia, 1 Germany, 1 Spain, 1 Canada, 1	PRISMA Framework	Systematic review and meta-analysis of RCTs  <b>Purpose:</b> Examine if TCIs are associated with a reduction of RE rates in the short, intermediate, and long terms  Intensity of TCIs scored low – high	N=26 n= 7,932  IC: Any interventions that addressed hospital RE for adults with chronic illness  Duration of TCIs ranged from 30 D	IV: TCI  DV1: AC-RR 30 Days  DV2: AC-RR 31-180 Days  DV3: AC-RR 180-365 Days	Two reviewers independently examined the study titles and abstracts from each article to determine relevance. Any disagreements were resolved by consensus between the two authors.  Potentially	Random effects meta-analysis, Mantel - Haenszel method  Univariable meta regression analyses  Statistical heterogeneity	<b>Any TCI</b>  DV1: OR 0.76 (0.52, 1.10) NNT 33  DV2: ARR 5%, OR 0.77 (0.62, 0.96) NNT 20  DV3: ARR	<b>LOE: 1</b>  <b>Strengths:</b> TC was effective in reducing all-cause intermediate-term and long-term RR; short term RR were impacted most by care provided by an RN, communication between hospital and PCP; and HV within 3 D.  <b>Weakness:</b> Higher intensity

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<p>Sweden,1 UK,1 Ireland,1 Italy,1 China,1 Taiwan, 1 Spain/Belgium, 1</p> <p><b>Funding:</b> None</p> <p><b>Bias:</b> None</p>		<p>on a scale of 0-16 based on 11 measures of intervention intensity for subgroup analysis</p>	<p>– 1 year with average of 3 HV and 2 TS calls</p>		<p>relevant articles were acquired, and full-text articles were independently assessed by both authors</p>	<p>by Cochrane Q test</p>	<p>13%, OR 0.58 (0.46, 0.75) NNT 8</p> <p><b>High intensity</b>  <b>TCI DV1:</b>                  OR 0.59 (0.38, 0.92) NNT 20;                  DV2: OR 0.69 (0.51 0.92) NNT 14 DV3: OR 0.57 (0.35, 0.92) NNT 8</p> <p><b>Low intensity</b>  <b>TCI</b>                  DV3: OR: 0.62 (0.46, 0.82)</p>	<p>interventions are needed to reduce shorter term RR; no cost-effectiveness of these interventions reported. Developing a valid and reliable method to measure the preventability of a readmission.</p> <p><b>Conclusion:</b> The results of this meta-analysis suggest that TC interventions are associated with reduced hospital RR in the intermediate and long term, and any type of TCI can reduce longer term RR</p> <p><b>Feasibility:</b> Appropriate and efficient to be employed by PC providers.</p>
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<p>Wong et al. (2015). Comparison of effects between home visits with telephone calls and telephone calls only for transitional discharge support: A randomized controlled trial.</p> <p><b>Country:</b> Hong Kong</p> <p><b>Funding:</b> Grant from the Research Grants Council of the Hong Kong Special Administrative Region, China</p> <p><b>Bias:</b> None</p>	<p>Transitional Care Model</p>	<p><b>Design:</b> RCT with 3 groups</p> <p><b>Purpose:</b> To examine the overall effects of a TCP for a group of DC pts with chronic diseases and included a TS only group to determine its differential effects</p> <p><b>Intervention:</b> 3 arms control (CG received placebo calls); HV (wk 1 and 3) &amp; TS (wk 2 and 4); TS only (4 calls per wk) NCM and trained NS conducted HV and TS calls</p> <p>Length: 4 weeks</p>	<p>n= 610 IG1 (HV+TS) =196 IG2 (TS) = 204 CG = 210</p> <p><b>Demographics:</b> M age – 77yrs m/f/w/o EDU- 48%/52%/31%</p> <p><b>Setting:</b> Large regional acute care hospital in Hong Kong</p> <p><b>IC:</b> 1<sup>0</sup> diagnosis rt/o resp, CV, DM, and renal conditions, MMSE &gt;20, Cantonese speaking &amp; can be contacted by phone.</p> <p><b>EC:</b> DC to ACF and F/U by an immediate DDMP after DC.</p> <p><b>Attrition:</b> 66 (11%)</p>	<p>IV1: HV &amp; TS</p> <p>IV2: TS only</p> <p>DV1: RR</p> <p>DV2: QOL</p> <p>DV3: Self efficacy</p> <p>DV4: Pt. Satisfaction</p>	<p>RR data collected via hospital info. system. Omaha System</p> <p>QOL (MOS 36 item Short Form Health Survey),</p> <p>Self-efficacy (short version Chronic Disease Self Efficacy Scale),</p> <p>Satisfaction (15-item questionnaire, MMSE)</p> <p>Data on DV2-4 collected at time of DC, 4 wks &amp; 12 wks resp.</p> <p>Inter-rater reliability ranged from 0.930 to 0.982 for different instruments.</p>	<p>Logistic regression model</p> <p>ANCOVA PPA analysis (for DV 2-4)</p>	<p>HV &amp; TS - 11.3%, OR = 0.583, p = 0.028 (at 4 wks)</p> <p>HV only- 10.7%, OR = 0.541, p = 0.041</p> <p>TS calls only - 11.8%, OR = 0.624, p = 0.103</p> <p>Either intervention improved QOL, self-efficacy and Pt satisfaction</p> <p>At 12 wks there was no significant difference in CG and IG.</p>	<p><b>LOE: II</b></p> <p><b>Strengths:</b> Examined the effectiveness of single and combined interventions in TC. Sensitivity analysis done, reliable instruments utilized.</p> <p><b>Weakness:</b> TS alone is not effective but when combined with HV can reduce 30 D RR. RR reduction was not evident at 12 wks, suggesting this TCI may not have a permanent impact; cost analysis not included in study. Conducted in Hong Kong and may not be applicable to US.</p> <p><b>Conclusions:</b> Interventions involving both HV and TS are more effective in reducing RR.</p> <p><b>Feasibility:</b> Effectiveness of the interventions suggests applicable to practice.</p>
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**Key:** AA – African American; AC– all cause; ACF – Assisted care facilities; a/f- after; ANOVA- analysis of variance; ARR – absolute risk reduction; b/f-before; C – clinic; CC- care coordination; CG – control group; CFIR-consolidated framework for implementation research; CD- chronic disease; CLD- chronic liver disease; CNS- clinical nurse specialist; CRF- chronic renal failure; CTS-care transition solution; CV- cardiovascular; D – days; dc- discharged; DC – discharge; DDMP - designated disease management program; DM- diabetes mellitus; DV-dependent variable; EC- exclusion criteria; ED – emergency department; EDU – education; ETOH- alcohol detox; f – female; FNP- family nurse practitioner; FT- full time; F/U – follow up; Hosp- Hospital; HV – home visits; IC – inclusion criteria; ICT- interprofessional care team; IG – intervention group; IRR - incidence rate ratio; IS- inpatient services; ISF- interactive systems framework; IV – independent variable; L- level; LOE – level of evidence; LSD- least significant difference; m- male; M- mean; MCD- multiple chronic diseases; MDS – multidisciplinary; MEDR – medication reconciliation; MLHF- Minnesota Living with Heart Failure questionnaire ; MMSE - mini mental state; mos- month; N – number of studies; n – number of participants; NCM- nurse case manager; NS- nursing student; NNT- number needed to treat; OS- outpatient services; OR – odds ratio; PC- primary care; PCC- physicians specializing in palliative care; PCP – primary care provider; PRAiHS- promoting action on research implementation in health services; Post/I- post intervention; Pre/I- pre-intervention; pt- patient; pts – patients; QOL – quality of life; RCT – randomized controlled trial; resp- respectively; RE – readmissions; rt/o- related to; RR- readmission rate; sig- significant; SW- social worker; TC – transitional care; TCI – transitional care interventions; TCM- transitional care management; TCP – transitional care program; TF- time frame; TS – telephone support; UKDFCM- University of Kentucky Residency for the Department of Family and Community Medicine; wk- week; w/- with; w/o- without; 1<sup>0</sup> – primary; 2<sup>0</sup> secondary.



## Appendix B

Table 2  
Synthesis Table

Studies		Baldwin et al.	Ballard et al.	Hamar et al.	Jackson et al.	Le Barre et al.	Morrison et al.	Roper et al.	Stranges et al.	Verhaegh et al.	Wong, et al.
Demographics	Year	2018	2018	2016	2016	2017	2016	2017	2015	2015	2015
	LOE	II	III	III	III	I	II	IV	III	I	II
	Design/Method	RCT	RCS	QCS	RCS	SR	RCT	SR	RCT	SR	RCT
	<b>Type of Pt/dx</b>										
	CHF	X	X	X		X	X		X	X	X
	MI,		X	X			X		X		
	COPD,	X		X		X	X		X	X	X
	DM	X	X			X	X		X	X	X
	PNA		X	X					X		X
	Medicare/Medicaid				X		X	X	X		
	Other Chronic dx (Cancer, RA, HTN, CAD, CRF, CLD)	X	X		X	X	X	X	X	X	X
	<b>Setting</b>	<b>PC</b>	<b>PC</b>	<b>Hospital</b>	<b>PC</b>	<b>Hosp/PC</b>	<b>PC</b>	<b>Hosp/PC</b>	<b>PC</b>	<b>Hosp/PC</b>	<b>Hospital</b>
	# of participants	75	1884	3900	7468	92	169	1415	1144	7932	610
Mean Age (yrs)	>18	53	59	38	>65	75	76 yrs	>60	>60	77	
Bias	LR	LR	LR	LR	LR	LR	None	LR	None	None	
<b>Discipline involved</b>	<b>FNP, SW, Pharm</b>	<b>RN</b>	<b>NCM</b>	<b>NCM</b>	<b>RN, SW</b>	<b>CNS, PPC</b>	<b>RN</b>	<b>SW, Pharm</b>	<b>RN</b>	<b>NCM, NS</b>	
Tools utilized (reliability)	R	R	R	R	R	R	R	R	R	R	

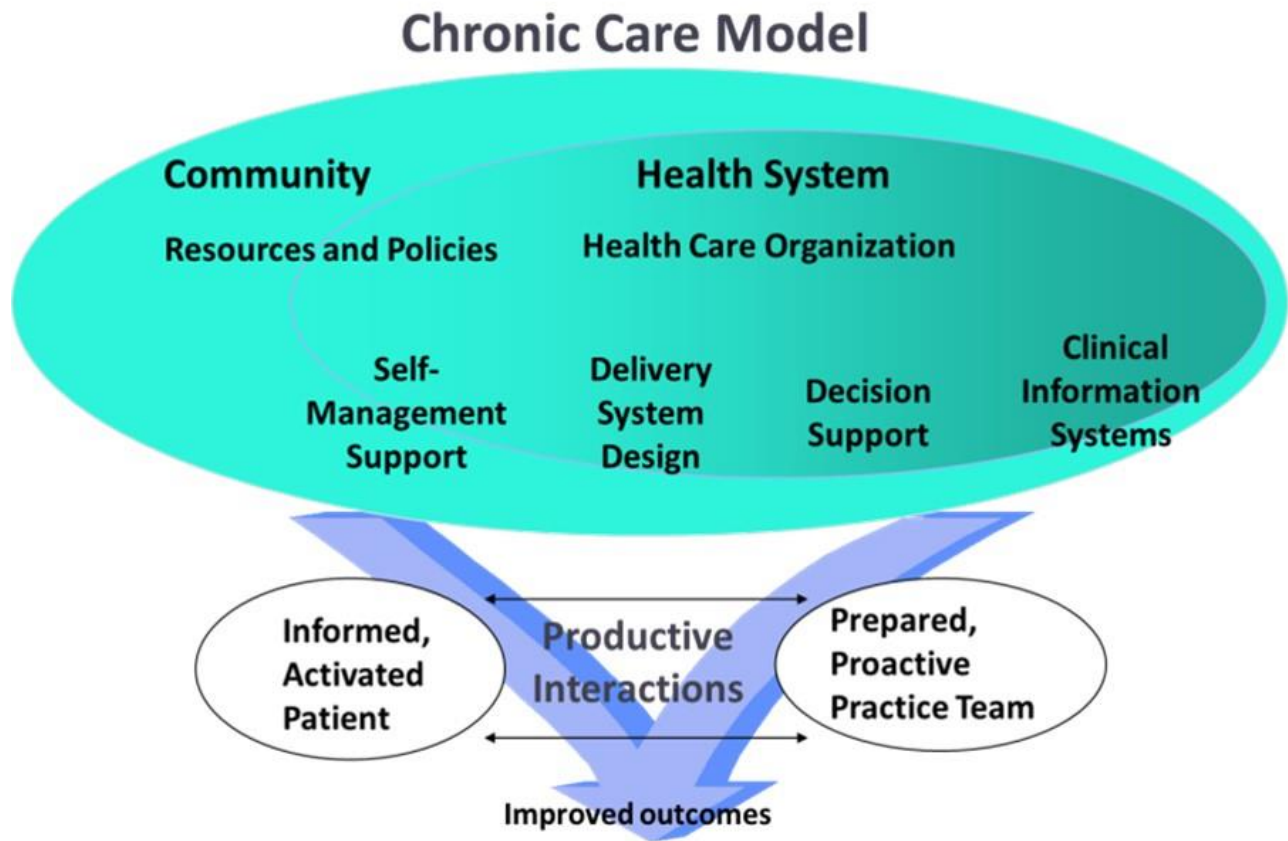
**Key:** CAD- coronary artery disease; CC – care coordination; CHF – congestive heart failure; CLD- chronic liver disease; CM – case management; COPD- chronic obstructive pulmonary disease; CRF- chronic renal failure; CS- cost Savings; D – days; DM- diabetes mellitus; dx – diagnosis; ED – emergency department; EDU – education; FNP- family nurse practitioner; f/u – follow up; Hosp- hospital; HTN- hypertension; HV – home visit; LOE – level of evidence; LR- low risk; MDS – multidisciplinary; MEDR – medication reconciliation; MI- myocardial infarction; mo -month; NCM – nurse case manager; NM – not measured; ns- not significant; NS- nursing student; NR – not reported; PC- primary care; PCP – primary care provider; pharm – pharmacist; PNA- pneumonia; QCS- quasi-experimental retrospective cohort study; QOL – quality of life; RA- rheumatoid arthritis; RCS- retrospective cohort study; RCT- randomized control trial; RE – readmissions; R – reliable; SM – symptom management; SR – Systematic review, SW – social worker; TC – transitional care; TCI – transitional care interventions; yrs. – years; ↓ - statistically significant reduction; ↑ -statistically significant increase; \*see Appendix A for details regarding classification (specific TCIs); \*\* - for primary outcomes based on PICOT; LOE based on Melnyk & Fineout-Overholt’s (2015) hierarchy of evidence.

	Level of TCI									* High/ Low intensity	
<b>TC Intervention</b>	<b>TS</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>
	<b>HV</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>
	TM		X		X					X	
	MEDR	X	X	X	X			X	X	X	
	CC		X	X		X	X	X		X	
	Other (F/U/EDU)	X	X		X	X	X	X	X	X	
	<b>Length of study</b>	<b>1 mo</b>	<b>1 mo</b>	<b>1 mo</b>	<b>1 mo</b>	<b>1 mo-1yr</b>	<b>3 mos</b>	<b>1 mo</b>	<b>3 mo</b>	<b>1 mo-1yr</b>	<b>1 mo</b>
<b>Outcomes</b>	<b>**Readmission 30D</b>	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Readmission > 30D	NM	NM	↓	NM	↓	↓	NM	NM	↓	↓
	ED visits	↓	ns			↓	↓			↓	
	Mortality	ns		↓		↓	↓			ns	
	F/U w/PCP		↑		↑		↑	↑	↑	↑	
	<b>**QOL</b>	↑			ns	↑	↑	↑		↑	↑
	<b>**SM</b>	↑	↑	↑		↑	↑	↑	↑	↑	↑
	CS	↑		↑				↑		↑	

**Key:** CAD- coronary artery disease; CC – care coordination; CHF – congestive heart failure; CLD- chronic liver disease; CM – case management; COPD- chronic obstructive pulmonary disease; CRF- chronic renal failure; CS– cost Savings; D – days; DM- diabetes mellitus; dx – diagnosis; ED – emergency department; EDU – education; FNP- family nurse practitioner; f/u – follow up; Hosp- hospital; HTN- hypertension; HV – home visit; LOE – level of evidence; LR- low risk; MDS – multidisciplinary; MEDR – medication reconciliation; MI- myocardial infarction; mo -month; NCM – nurse case manager; NM – not measured; ns- not significant; NS- nursing student; NR – not reported; PC- primary care; PCP – primary care provider; pharm – pharmacist; PNA- pneumonia; QCS- quasi-experimental retrospective cohort study; QOL – quality of life; RA- rheumatoid arthritis; RCS- retrospective cohort study; RCT- randomized control trial; RE – readmissions; R – reliable; SM – symptom management; SR – Systematic review, SW – social worker; TC – transitional care; TCI – transitional care interventions; yrs. – years; ↓ - statistically significant reduction; ↑ -statistically significant increase; \*see Appendix A for details regarding classification (specific TCIs); \*\* - for primary outcomes based on PICOT; LOE based on Melnyk & Fineout-Overholt’s (2015) hierarchy of evidence.

Appendix C

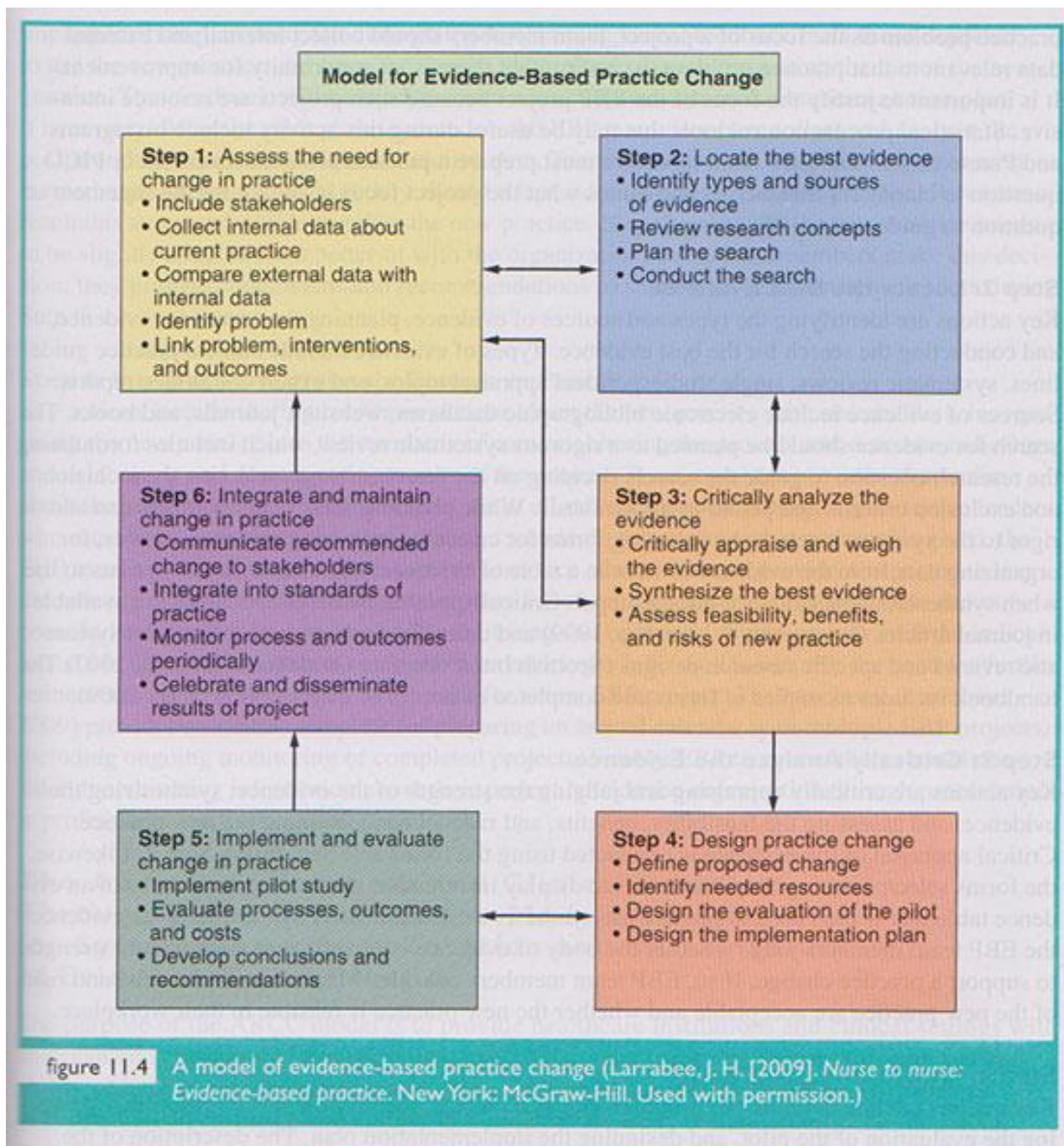
*Conceptual Framework*



(Wagner 1998)

## Appendix D

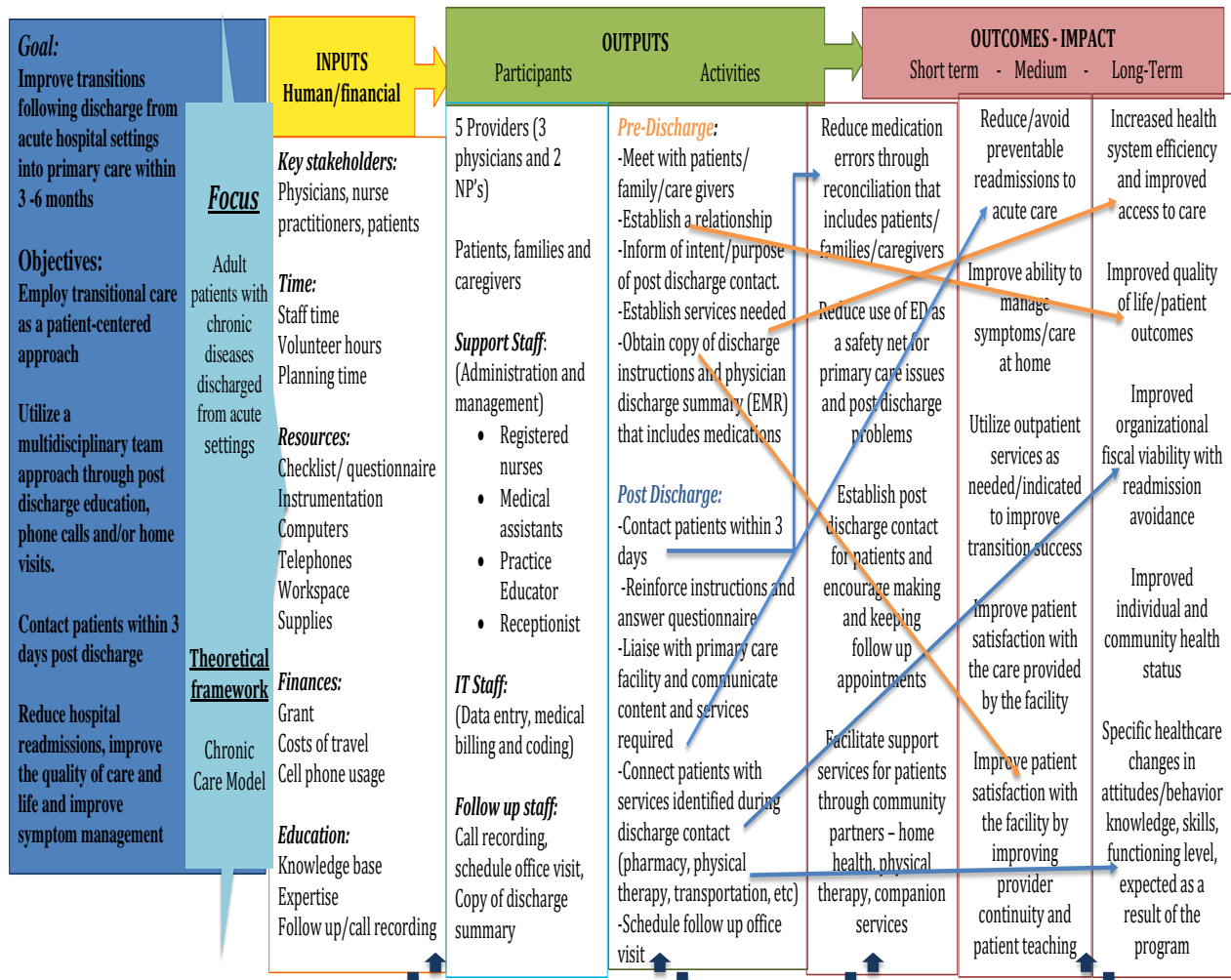
## EBP Model



(Melnyk &amp; Fineout-Overholt, 2015)

Logic Model

Appendix E



**Assumptions**  
Influence and shape practice facility policy and delivery of care; External agents and communities serve as a catalyst for change through services offered; Educate and connect patients with accessible services available; prevention of shifting revenues/incentives to providers to improve health; Workforce put together will address health care issue/concerns; Advocacy for patients/families/ caregivers; Increase in adequacy and efficiency during office visit; Overall smooth transition of patient from an acute setting into primary care.

## Budget Plan

## Appendix F

	<b>Costs</b>	<b>Direct Expenses</b>	<b>Indirect Expenses (In-Kind Support)</b>
<b>Personnel/Staff</b>			
<b>Project Director</b> (DNP Student: W. Sagoe)	\$40/hour for 20 hours per week X 12 weeks	\$1,920.00 (20%)	\$7,680.00 (80%)
<b>Practice Business Manager</b> , Janera Castro (TCM coding)	1 hour/week @ \$30/hr for 15 weeks		(\$450.00)
<b>CEO and Primary Care Physician</b> , Dr. Michael Castro	2 hours/week @ \$75/hr for 12 weeks		(\$1,800.00)
<b>Advanced Practice Provider</b> , NP Serena Roberts (Practice Champion)	4 hrs/week @ \$43/hr 12 weeks		(\$2,064.00)
<b>Office staff/MA</b> for admission, discharge and readmission tracking	4 hrs/week @ \$14/hr x 15 weeks.	\$840.00	
<b>Equipment/Materials</b>			
Tools for patient assessment during Home visit	Equipment Bag \$25.00 Thermometer \$15.00 BP cuff \$30.00 Weighing Scale \$35.00 Stethoscope \$70.00 Pulse oximeter \$15.00	\$190.00	
Cell phone to call patients for 12 weeks		\$400.00	
Printing Pt's EMR for paper chart, printing/duplicating Instrument, consent forms and evaluation questionnaires (and copy of signed consent form to be given to each pt)		\$100.00	
File folders to organize patient documents in the locked file cabinet		\$50.00	
Pill cutter for patients	@ \$5.00 X 20	\$100.00	
Pill organizer for patients	@ \$6.00 X 20	\$120.00	
<b>Office/Operations</b>			
Utilizing practice computer for checking the EMR to identify patients and data collection	2 hours/week for 12 weeks		\$200.00
Utilizing practice computer for documenting the home visit for 12 weeks			\$600.00
Utilizing practice computer for outcome data collection			\$400.00

<b>Travel Reimbursement</b>			
<b>Home visits by Project Director</b>	@ 0.50/mile estimating 40 miles roundtrip x 20 pts	\$400	
<b>Total Expenses</b>		<b>Expenses</b>	<b>Indirect Expenses</b>
		<b>\$ 4120.00</b>	<b>\$4314.00</b> <b>(In Kind)</b> <b>\$13194.00</b>

*Care Transitions Measure (CTM-15)* Appendix G

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_

Who completed interview?  Patient  Caregiver

The first few statements are about the time you were in the hospital . . .

1. Before I left the hospital, the staff and I agreed about clear health goals for me and how these would be reached.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/

Don't Remember/ Not Applicable

2. The hospital staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left the hospital.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/

Don't Remember/ Not Applicable

3. The hospital staff took my preferences and those of my family or caregiver into account in deciding where my health care needs would be met when I left the hospital.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/

Don't Remember/ Not Applicable

The next set of statements is about when you were preparing to leave the hospital . . .

4. When I left the hospital, I had all the information I needed to be able to take care of myself.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/

Don't Remember/ Not Applicable

5. When I left the hospital, I clearly understood how to manage my health.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/

Don't Remember/ Not Applicable



6. When I left the hospital, I clearly understood the warning signs and symptoms I should watch for to monitor my health condition.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

7. When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going to be met.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

8. When I left the hospital, I had a good understanding of my health condition and what makes it better or worse.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

9. When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

10. When I left the hospital, I was confident that I knew what to do to manage my health.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

11. When I left the hospital, I was confident I could actually do the things I needed to do to take care of my health.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

The next statement is about your follow-up doctors' appointments . . .

12. When I left the hospital, I had a readable and easily understood written list of the appointments or tests I needed to complete within the next several weeks.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

The next set of statements is about your medications...

13. When I left the hospital, I clearly understood the purpose for taking each of my medications.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

14. When I left the hospital, I clearly understood how to take each of my medications, including how much I should take and when.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

15. When I left the hospital, I clearly understood the possible side effects of each of my medications.

Strongly Disagree    Disagree    Agree    Strongly Agree    Don't Know/  
Don't Remember/ Not Applicable

*Medication Discrepancy Tool (MDT)* Appendix H

MDT is designed to facilitate reconciliation of medication regimen across settings and prescribers

- Medication Discrepancy Event Description: Complete one form for each discrepancy
- Causes and Contributing Factors :: Check all that apply

:: Italicized text suggests patient's perspective and/or intended meaning

Patient Level \_\_\_\_\_

1.  Adverse Drug Reaction or side effects
2.  Intolerance
3.  Didn't fill prescription
4.  Didn't need prescription
5.  Money/financial barriers
6.  Intentional non-adherence
  - "I was told to take this but I choose not to."
7.  Non-intentional non-adherence (ie: Knowledge deficit)
  - "I don't understand how to take this medication."
8.  Performance deficit
  - "Maybe someone showed me, but I can't demonstrate to you that I can."

System Level \_\_\_\_\_

9.  Prescribed with known allergies/intolerances
10.  Conflicting information from different informational sources  For example, discharge instructions indicate one thing and pill bottle says another.
11.  Confusion between brand & generic names
12.  Discharge instructions incomplete/inaccurate/illegible  Either the patient cannot make out the hand- writing or the information is not written in lay terms.
13.  Duplication.  Taking multiple drugs with the same action without any rationale.
14.  Incorrect dosage

- 15.  Incorrect quantity
  - 16.  Incorrect label
  - 17.  Cognitive impairment not recognized
  - 18.  No caregiver/need for assistance not recognized
  - 19.  Sight/dexterity limitations not recognized
- 

Resolution :: check all that apply

- Discussed potential benefits and harm that may result from non-adherence
  - Encouraged patient to call PCP/specialist about problem
  - Encouraged patient to schedule an appointment with PCP/specialist to discuss problem at next visit
  - Encouraged patient to talk to pharmacist about problem
  - Addressed performance/knowledge deficit
  - Provided resource information to facilitate adherence
  - Other
-

**Overall Quality of Care Transition Score:** This score reflects the overall quality of the care transition, with lower scores indicating a poorer quality transition, and higher scores indicating a better transition.

### Scoring Protocol

Step 1: Code responses as Strongly Disagree =1; Disagree =2; Agree =3; Strongly Agree =4.

Step 2: Assign code (e.g., 9) to missing responses, and a different code (e.g., 99) to Don't Know/Don't Remember/Not Applicable. These will not be counted as answered questions for Step 3a, as the 9 and 99 codes are not included in the 4 point Likert scale and therefore will not contribute to the CTM® score. You can, however, get a count of 99's in order to calculate a percentage of these responses relative to questions answered (step 3a.)

Step 3: Compute a mean score for each respondent based only on the questions answered. To do this:

- Step 3a: For each respondent count the number of questions answered. (In SPSS, Step 3a is accomplished with the Count command in the Transform menu and Step 3b by a Compute command).
- Step 3b: For each respondent obtain a summated score by adding Step 1 values across answered questions.
- Step 3c: Obtain **mean** for each respondent by dividing Step 3b result by Step 3a result. The name of this value is **mean**.

Step 4: Perform a linear transformation of the result of Step 3c to obtain a user-friendly 0-100 score. Use the following formula:

- 0-100 CTM® Score for each respondent =  $[(\text{Step 3c result}-1)/3]*100$  .
- In SPSS Syntax this computation is:

COMPUTE CTM15\_0\_100 = (((ctm15)-(1))/(3))\*100 . EXECUTE .

Chart Audit

Appendix J

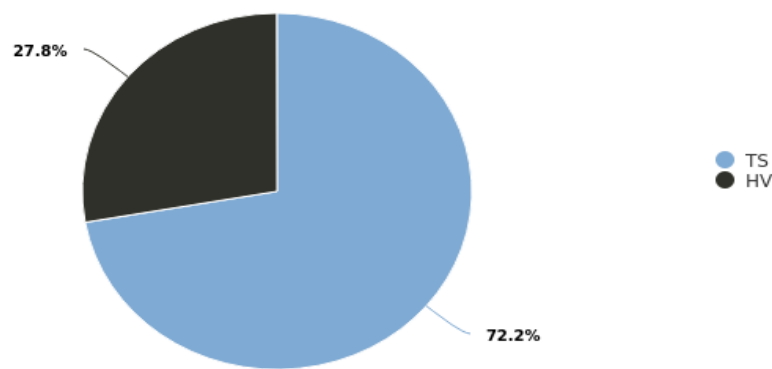
<b>ID #</b>	<b>AGE/ YEARS</b>	<b>GENDER 1 Male 2 Female</b>	<b>DIAGNOSIS</b>	<b>INTERVENTION 1 Phone Call 2 Home Visit 3 Phone Call/ Home Visit</b>	<b>CTM Score/60</b>	<b>Emergency Department visit 30 days</b>	<b>Hospital Readmission 30 days</b>
100							
101							
102							
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105							
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*Intellectus Statistics*

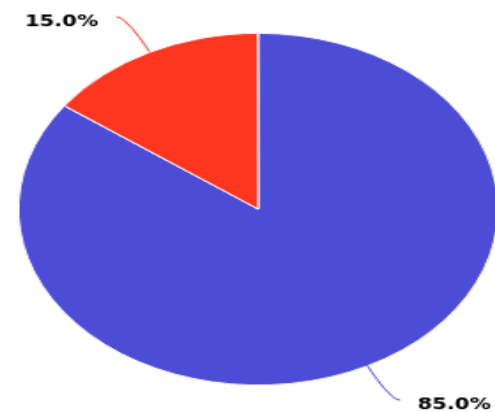
Appendix K

*Pie Chart of TS\_HV*

(% of Telephone Support (TS) & Home Visit (HV))



*Pie Chart (% Readmission\_Participant)*



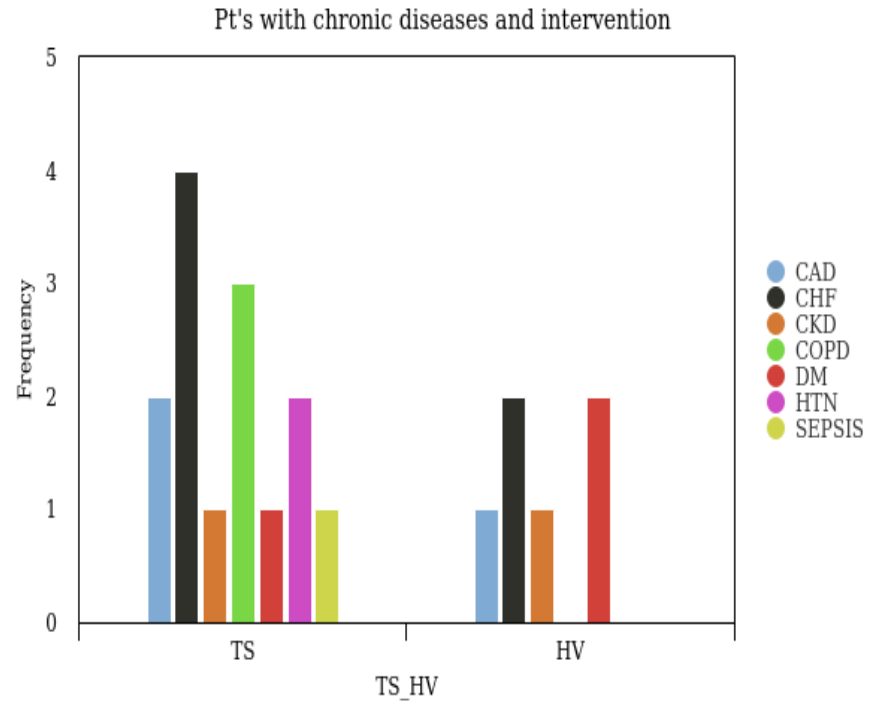
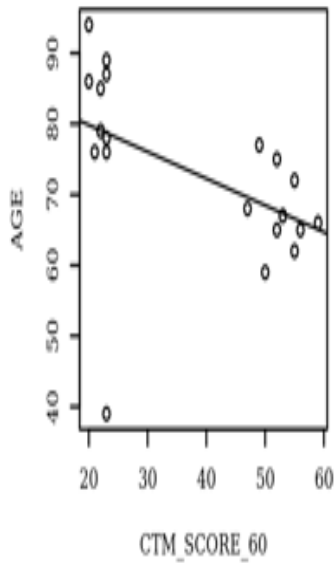
*Logistic Regression Results with CTM\_SCORE\_60 Predicting TS\_HM*

Variable	<i>B</i>	<i>SE</i>	95.0% CI	$\chi^2$	<i>p</i>	<i>OR</i>
(Intercept)	-4.12	2.74	[-9.50, 1.25]	2.26	.133	
CTM_SCORE_60	0.17	0.12	[-0.06, 0.40]	2.17	.141	1.19

*Note.*  $\chi^2(1) = 10.01, p = .002, \text{McFadden } R^2 = 0.41.$

Barplot of TS\_HV by DIAGNOSIS

Scatterplots between each variable with the regression line added



Two Proportions z-Test for the Difference between  $p_1$  and  $p_2$

Samples	Responses	$n$	Proportion	$SD$	$SE$
$p_1$	228	455	0.5	0.50	0.02
$p_2$	3	20	0.15	0.36	0.08

Note.  $z = 4.21, p < .001, CI$  for  $\alpha = 0.05: [0.19, 0.51]$