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Transitional Care Medical House Call: A Pilot Project

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Abstract

Problem Description: Vulnerable, homebound older adults are highly susceptible to unplanned 30-day hospital readmissions, which is costly for the health care system. As a result, health care expenditures for this population continue to rise. Studies have shown that transition of care programs, when complemented with home-based primary care delivery, may improve health care outcomes for this population.

Purpose: The purpose of this quality improvement pilot project was to implement medical house calls as a component of transitional care management (TCM) and measure patient outcomes such as unplanned 30-day readmission rates and correlate predictors of readmission. As a secondary outcome, the project explored, tracked, and later analyzed point-of-care concerns during medical house call visits, which were conducted by a provider with prescriptive authority, a nurse practitioner (NP).

Interventions: Medicare beneficiaries, 65 years and older, who were discharged from skilled nursing facilities (SNFs) to home were identified by convenience sampling through referral and offered a home visit by a NP. Before discharge, patients' acuity was assessed, and a LACE Index score was assigned. Unplanned 30-day readmissions to the hospital were measured and correlated to point-of-care conditions found during medical house call visits: number of days to see patients; common distribution of LACE Index scores; number of medications (polypharmacy) before and after visits; prescriptions required; comorbidities; and time to primary care provider (PCP) visits.

Results: A total of 145 patients were seen by the NP. LACE Index scores ranged from 11-15 ($M = 12.6$; $SD = 2.9$). The readmission rate was 19.2%, which was higher than the benchmark, 18.5%; however, the patients' LACE Index scores indicated high acuity. Most patients

experienced two comorbidities, with hypertension being the most common. Regression analysis showed that heart failure was a significant predictor of unplanned 30-day hospital readmissions. Heart failure patients were 5 times more likely to be readmitted than patients with other comorbidities. Medications were reduced after medication reconciliation from 17 to 11, which was statistically significant ($z = -7.497, p < .001$). Almost half of the patients required prescriptions during the visit, and more than half were unable to see their PCP for 14 days or more.

Interpretation: This project has shown that older adults discharged from a higher level of care can benefit from TCM through medical house calls by a NP within 14 days after discharge. Visits significantly reduced polypharmacy, provided a way to get prescriptions that would otherwise be unobtainable from a PCP for 14 days or more after discharge, and managed high readmission risks.

Conclusion: Further study of system redesign and policy change that affect care delivery by NPs in care transitions is highly recommended.

Keywords: readmission reduction, transitional care management, medical house call

Transitional Care Medical House Calls: A Pilot Project

Introduction

The population of adults aged 65 years and older is increasing because of better health care and longer life expectancy. By 2030, older adults are projected to comprise 19% of the total United States (U.S.) population, as compared with 13% in 2010 (Wilson & Bachman, 2015). The care of the aging population presents a unique challenge for the health care system. Adults aged 65 or older often have complex and interrelated medical and social comorbidities (Stall, Nowaczynski, & Sinha, 2014). In the United States, roughly one million older adults are homebound because of their age and health status (Stall et al., 2014). In addition, advancing age is associated with the likelihood of chronic diseases such as chronic kidney disease, diabetes, and hypertension (Gabayan, Sarkisian, Lian, & Sun, 2015; Levine, Steinman, Attaway, Jung, & Enguidanos, 2012). Thus, older adults may experience frequent hospital admissions and are at higher risk of readmission that may precipitate functional decline (Ornstein, Smith, Foer, Lopez-Cantor, & Soriano, 2011; Stall et al., 2014). As a result, health care expenditures are increasing (Towne, Jr., Ory, & Smith, 2014) and will continue to grow. They have soared from \$6.2 billion in 1997 to \$2.8 trillion in 2012 (Hamar et al., 2016). If not addressed, this amount will continue to increase.

In October 2012, Medicare began reducing payments to hospitals that reported excessive readmissions, based on benchmarks recommended by the Medicare Payment Advisory Commission (2007). Of 12 million hospital discharges for Medicare beneficiaries, 20% resulted in readmission within 30 days of discharge. In the first year of the Hospital Readmission Reduction Program, 2,200 hospitals received cumulative penalties of \$280 million (Hamar et al., 2016).

Transitional care management (TCM) programs have been developed to lower hospital readmissions (Coleman, Parry, Chalmers, & Min, 2006; Naylor et al., 2004). Transitional care refers to the movement of patients between levels of care, between health care practitioners, or between health care settings, during an acute or chronic illness (Center for Improving Value in Health Care, 2012; Geary & Schumacher, 2012). TCM models can help reduce unplanned 30-day hospital readmissions by 30%; this type of medical care is efficient, affordable, and more accessible for both families and the health care system (DeJonge & Taler, 2002; Smith, Pan, & Novelli, 2016). TCM services include medication reconciliation, medication refills, pain management, prevention or early treatment of infection, chronic care management, and coordination of care. Patients who receive TCM usually have complex chronic conditions and are homebound, which makes them more vulnerable (Naylor, Aiken, Kurtzman, Olds, & Hirschman, 2011; Naylor & Sochalski, 2010).

However, the American Academy of Home Care Medicine (AAHCM, n.d.) believes that traditional TCM may not be the best approach for older adults because their access to providers is compromised by cognitive impairment and homebound status, even if temporary. With no recourse, family members or caregivers have no choice but to send patients to an emergency department (ED). This happens most frequently when patients, their families, or caregivers cannot contact the primary care provider, medication refills have been exhausted, pain cannot be managed or controlled, or signs of infection have appeared (Levine et al., 2012; Stall et al., 2014). Thus, the cycle of hospital admission and readmission begins. The AAHCM proposes that adding medical house calls, where patients are seen in their homes, to the traditional TCM model can measurably improve successful implementation of TCM (AAHCM, n.d.).

In recent years, Medicare data have shown that medical house calls have increased from 1.4 million visits in 1999 to 2.3 million in 2009 (Bonvissuto, 2013). According to the American Academy of Family Physicians, medical house calls are fast becoming a tool for primary care providers; they provide access to care and reduce the institutionalization of older adults (Unwin & Tatum, 2011). TCM provides patients with services as they transition from high acuity care, such as they receive in hospitals or skilled nursing facilities (SNFs), to home or residential care (Centers for Medicare & Medicaid Services, 2016).

Problem Description

Placer County, a rural county in Northern California, has a growing number of adults aged 65 years or older, who represent 17.8% of its estimated population of 371,694 (U.S. National Census Bureau, 2014). The older adult population living alone is estimated to be 30,496. The population aged 65-74 years is 6,212, the population aged 75-84 years is 5,089, and the population aged 85 years and older is 2,994. These statistics highlight an older adult population who may be living alone and who may need assistance in transitioning from acute or SNF care to their domicile.

In the Sacramento region in 2015, the 30-day, all-cause, hospital readmission rate was 17% versus California's rate, as a whole, which was 18.5% (Health Services Advisory Group, Medicare Quality Improvement Organization for California [HSAG], 2016). Of those who were readmitted to hospitals, 16.1% were discharged to their home, 18.8% were discharged to a SNF, and 18.9% were discharged to a home health agency (HHA). Of patients who were discharged from a hospital directly to home between January 1, 2015, and December 31, 2015, 41.2% were readmitted who did not see their primary care provider. Almost 60% (58.8%) of patients who

were readmitted to a hospital did not have a 30-day follow-up visit; 36.2% returned within a week of discharge (HSAG, 2016).

Available Knowledge

The Johns Hopkins nursing evidence-based practice model (Dearholt & Dang, 2012) was used to synthesize the evidence from 17 articles and develop recommendations. A search of selected databases (i.e., CINAHL, MEDLINE, PubMed, Regional Business News, Social Gerontology, and WorldCat) was conducted using the key terms *hospitalization of older adults*, *cost of hospitalization*, and *Medicare readmission reduction*. See Appendix A for the evidence table.

Four randomized controlled trials provided substantial evidence that home-based primary care lowers unplanned readmissions to EDs and hospitals (Coleman et al., 2006; Goldman et al., 2014; Levine et al., 2012; Naylor et al., 2004). The hospital discharge process needs innovative alternatives to prevent readmissions; home-based primary care or transitional care medical house call (TCMHC) visits can effectively complement the process (Goldman et al., 2014). Because the discharge process varies from one health care facility to another, an efficient TCM program is not without benefits, especially for older adults with cognitive impairment (Wilson & Bachman, 2015). This is a gap that the AAHCM (n.d.) believes could be filled by medical house call practices.

Several studies (Hamar et al., 2016; Stall et al., 2014) suggest that community resources such as home health and hospice services can prevent unplanned readmissions for older adults, especially those with readmission-sensitive diagnoses. These include chronic heart failure, chronic obstructive pulmonary disease, pneumonia, and an underlying comorbidity of Alzheimer's disease and dementia (Wilson & Bachman, 2015). TCMHC visits are recommended

within the first 24 hr (Naylor & Sochalski, 2010) and up to 7 days after discharge (Gabayan et al., 2015). In addition, to enhance effectiveness, visits should be coordinated with discharge protocols at hospitals or SNFs (Coleman et al., 2006; De Jonge & Taler, 2002; Society of Hospital Medicine, 2010; Walker et al., 2007).

Transitional care reduces readmissions. Transitional care interventions have been shown to address the needs of vulnerable older adults (Coleman et al., 2006; Naylor et al., 2004). In the two randomized controlled studies just cited, readmission to EDs was reduced by using a variation of the transitional care model. Stall et al.'s (2014) systematic review of the literature corroborates the findings of these studies.

Nurse practitioners in transitional care initiatives. Naylor and Sochalski (2010) proposed that advanced practice nurses like nurse practitioners (NPs) play a significant role in the TCM model. NP-led, home-based, primary care programs are a feasible option in preventing unplanned readmissions (Ornstein et al., 2011). Transitional care visits reduce unplanned readmissions; result in a higher quality of care and greater patient and family satisfaction; and, ultimately, reduce health care costs. The opportunity is ripe to integrate medical house calls, already developed in TCM models, into transitions of care for homebound older adults (Coleman et al., 2006; Naylor & Sochalski, 2010; Ornstein et al., 2011).

Studies (Kuo et al., 2015; Smith et al., 2016) corroborate that NP-led primary care is comparable to generalist physician care and has shown positive effects in quality, outcomes, and reductions in unplanned readmissions (Kutzleb et al., 2015).

Cost savings for Medicare. Readmissions for Medicare beneficiaries average between \$9,000 and \$15,000; by contrast, a single NP visit costs roughly \$180 per visit (Smith et al., 2016). Scalable models, including service delivery models that use primary care physicians and

NPs in home-based care delivery, can reduce readmissions and Medicare costs (Hamar et al., 2016). See Appendix B for synthesis of evidence.

Rationale

The theory of transitions (Meleis, 1978, 2010) guided the development of this project and provided its theoretical framework. According to Meleis (2010), transitions are triggered by events that begin as soon as a change situation is anticipated. Transitions are passages from one relatively stable state to another. In the context of health care, they affect individuals as they move from acute care hospitals or SNFs to home or residential care. Recognizing that transitions affect vulnerable populations like older adults (Stall et al., 2014), Meleis' theory integrates the concepts of facilitating more effective transitions from higher levels of care to home and minimizing adverse events that trigger a return to a higher level of care (Geary & Schumacher, 2012).

Applying transitions theory to this scholarly project took into account the complexity of the transitions that affect patients, formal and informal caregivers, health care providers, and the health care system. The intervention incorporated contextual frameworks and techniques from the evidence (Coleman et al., 2006; Naylor & Sochalski, 2010; Society of Hospital Medicine, 2010).

As a vulnerable segment of the health care population, most, if not all, homebound, older adults risk the loss of their independence. According to Shearer (2009), this population also confronts the challenges of economic insecurity, access to community services, and health care. Chronic health conditions also predispose many to have multiple, unmet, social and health care needs. On a societal level, older adults prefer to stay in their own home as long as possible (Eckert, Morgan, & Swamy, 2004).

In this scholarly project, transitions theory was used to help older adults better recognize and understand their transitions from health care facility to home. The personal and social resources of patients and families were determined, and shared health care goals, and the means to attain them, were explored and developed. Reducing unnecessary trips to the ED was presented to participants as a shared goal. Transitions theory bolstered our assumption that vulnerable older adults need as much support as they can get during transitions and that a TCMHC intervention could help them immeasurably during that vulnerable time. The intervention was designed to bridge the gap in care between health care facility and home. The intervention addressed the transition theory's stipulations.

The project used the Kellogg logic model (2004) in tandem with Meleis' (2010) theory of transition to evaluate the project's effectiveness. The logic model provided the framework to organize the project into workable steps and trackable milestones, taking into account available resources, input from stakeholders, and short- and long-term outcomes. For example, the framework synchronized the attainment of short-term outcomes (e.g., Outcome 1: development of a workflow) with the project's long-term outcomes (e.g., Outcome 13: use of the workflow for broader audiences).

Integrating selected concepts from transitions theory added perspective on the complexity of transitions (Geary & Schumacher, 2012). Health care providers (e.g., cardiologists, hospitalists, primary care providers, and other specialists), formal caregivers (e.g., HHA nurses), informal caregivers (e.g., family members or significant others), pharmacists, suppliers of durable medical equipment, food stores, and others are all interrelated components in transitions to home. See Appendix C for theoretical framework.

Specific Aims

The purpose of this quality improvement project was two-fold: to examine medical house calls as a component of TCM in reducing unplanned 30-day readmissions to the hospital and to examine the care issues that are encountered during TCMHC visits. Medical house call visits by NPs differ from HHA visits by nurses because the former have a broader scope of practice. NPs have prescriptive authority.

The project was appropriate for the host organization and its collaborators because it addressed recent developments in Medicare programs. Further, the 4-month pilot period allowed the project implementation sufficient time to collect data, useful now and for future development, without taxing limited resources.

Methods

This quality improvement project used a pilot study approach to examine medical house calls as part of TCM and its effect on unplanned 30-day hospital readmissions after discharge from a SNF. It implemented evidence-based practice using a case study design (Issel, 2004). The referral sources for the project came from SNFs in an area that serves roughly 69,447 residents aged 65 and older (U.S. Census Bureau, 2014). SNFs have short-stay residents whose 30-day unplanned hospital readmissions are measured by Medicare.

Context

Medicare's readmission reduction initiative (Medicare Payment Advisory Commission, 2007) triggered the development of this pilot project. All health care agencies are now challenged to meet the requirements of this initiative. This project thoroughly examined the pros and cons of initiating such an endeavor. The pilot project found that most of the challenges were manageable, while others were better addressed in future projects or studies.

SWOT analysis. Strength, weakness, opportunity, and threat (SWOT) analysis provided a clear profile of the project's basic characteristics (see Appendix D for SWOT analysis). A local, home-based, primary medical practice in collaboration with local medical groups, SNFs and HHAs, which offered the most accessible resources, hosted the project (see Appendix E for memorandum of understanding). Home-based care is cost-effective in providing care to older adults with complex morbidities and comorbidities (Wilson & Bachman, 2015). Like HHAs, a home-based primary medical practice, led by an NP, can provide essential care to older adults at home. This infrastructure, coupled with the medical practice's pioneering efforts in establishing home-based primary care in its region, allowed for relatively seamless and time-efficient implementation of the house call portion of the project.

Among the project's perceived weaknesses was that home-based primary care has inherent challenges. It has to account for logistics such as provider travel to/from patients, environmental variables such as hazardous weather conditions, and the lack of resources available in an office-based practice (e.g., the assistance of medical assistants for vital signs and intake activities). Geographic location, although predetermined, limits the number of transitional visits per day, hence the number of patients per day. Compared with office-based practice, in which providers can see three to four patients an hour, a house call practice averages one to two patients an hour.

Nonetheless, this model of care is strategically positioned to address a growing need. A home-based care model can address one of Medicare's highest priorities: reducing hospital readmissions for homebound patients. Further, it offers opportunities for partnerships between hospitals, health systems, medical practices in the community, HHAs, Medicare and other governmental agencies, voluntary health associations like the Alzheimer's Association and the

American Association of Retired Persons (AARP), and other stakeholders to strengthen transitions of care. This model of care focuses on TCM to address a larger population of patients.

The project confronted several perceived threats, not the least of which was Medicare's potential denial of claims for TCMHC visits. Medicare could change payment structures and decide not to reimburse medical house call visits at all. Of added concern was the scarcity of duplicated results, less homogeneity in protocols, and the perception that home-based primary care was a relatively new model of care.

Based on a preliminary SWOT analysis, the project determined that the strengths and opportunities of a TCMHC model outweighed its weaknesses and threats. The host organization provided the local care environment, and the organizational culture, which showed a readiness to change, supported the project without external funding.

The participants in this pilot project were older adults in Sacramento and Placer Counties who had been discharged from a SNF. The local care environment supports care for homebound older adults, a strategy that can reduce readmissions. The NP-led medical house call practice, which collaborates with other local providers, provided appropriate support personnel.

Interventions

The project's workflow offers a blueprint for other investigators and researchers who wish to reproduce or improve upon it (see Appendix F for workflow of the Transitional Care Medical House Call Project). The workflow document was created with input from various stakeholders prior to project implementation and correlated interventions with Meleis' (2010) theoretical model, which accounts for the interrelationship of factors that affect patients, families, and caregivers in the transition of care cycle.

Local medical groups, HHAs and SNFs referred potential participants to the project. Before or at the time of discharge, patients in the SNF were assessed and assigned a LACE Index score, Step 1 in the TCMHC workflow. LACE Index scores determined visit priority. However, all of the referred patients had LACE Index scores of 9 or higher, which implied a sicker patient population and higher risk for readmission.

In Step 2, HHAs were assigned patients upon discharge who required nursing, physical therapy, and social services. The workflow adhered to Medicare protocol that patients must be called 48 hr after discharge (Step 3). During initial contact, consent was obtained, and a TCMHC visit by the NP was scheduled with the patient, family, or caregiver. During face-to-face visits (Step 4), data points, beginning with LACE Index scores, were noted, recorded, and tracked. Care coordination was implemented, which marked Step 5 in the TCMHC workflow.

Step 6 in the TCMHC cycle entailed evaluating and measuring outcomes, the data for which was collected from HHA nurses by online survey and from patients or their family by telephone follow up phone call. Step 7 was determined in one of two ways: positively, the end of a home health episode or, negatively, readmission to the ED or hospital.

Logic model. The Kellogg logic model (W.K. Kellogg Foundation, 2004) describes the steps and activities that measured this project's outcomes. It provided a blueprint of tasks that corresponded to targeted outcomes and served as a guide to implementation. The model also guided data collection and served as a reference point for project implementation and evaluation. The interventions were closely correlated with the theoretical model. The logic model is outlined in more detail in Appendix G.

The pilot project was simplified by organizing resources into four foci: partnerships, clinical collaboration, measurements, and financials.

The first focus entailed the development of *partnerships* with collaborating and referral organizations (i.e., medical house call providers, medical groups, HHAs, local SNFs, and other agencies) and comprised short-term Outcomes 1 and 2 and long-term Outcomes 12 and 13. Activities included discussion of the proposed workflow and exploration and synthesis of existing TCM models. The output was the development of the TCMHC workflow and the impact of hospitals, SNFs, and other HHAs on the future development of the TCMHC program.

The second focus, *clinical collaboration*, engaged physicians, NPs, physician assistants, registered nurses, licensed vocational nurses, licensed social workers, medical assistants, and others. Activities included ongoing discussion of TCMHC workflow and modifications during the implementation phase, as needed. This focus comprised short-term Outcome 3 and long-term Outcome 14. Activities included the tasks that the NP performed during each visit: medication reconciliation (polypharmacy addressed); medication refills as needed; pain management; prevention or early treatment of infection; chronic care management; and coordination of care with the HHA and other agencies, such as a pharmacy. Output included feedback that was incorporated into the workflow. The intended impact of this focus was the development of clinical teams for future TCMHC programs.

The third focus, *measurements*, involved data collection on the 30-day hospital readmission rate for patients who received a TCMHC visit. The collaborating HHA provided the software to retrieve this data. Also tracked were concerns raised during visits and point-of-care data points that corresponded to short-term Outcomes 4, 5, 6, 7, 8, 9, and 10 and long-term Outcomes 15 and 16. HHA nurses and patients, families, or caregivers were polled on their satisfaction with TCMHC. The intended output was data points tracked, readmission rate measured, and survey responses collected. The intended impact was reducing unplanned 30-day

hospital readmissions and the impact on patient, family, or caregiver stress, managing Medicare cost, and developing a sustainable practice initiative.

Finally, the fourth focus, *financials*, examined whether Medicare reimbursement was sufficient enough to sustain the program, as outlined in short-term Outcome 11 and long-term Outcome 19. Activities included ensuring timely billing, establishing Medicare reimbursement rate, and determining financial sustainability based on billing and reimbursements. The expected output was funding to sustain and scale the initiative, namely income generation for the host organization to sustain the program but scalable to other organizations.

Short-term outcomes are listed below:

1. By December 2016, the TCMHC workflow was developed.
2. By May 2017, 80% of providers were oriented to the TCMHC workflow.
3. By October 2017, feedback from stakeholders was incorporated into the TCMHC workflow.
4. By August 2017, the readmission rates of TCMHC recipients were determined using third-party software.
5. By August 2017, data points were tracked to determine significant point-of-care activities. These data points included the number of days to see patients, LACE Index scores, the number of medications used before and after visits, need for prescriptions, PCP appointments, and comorbidities.
6. By August 2017, 75% of eligible and consenting patients who were discharged from the SNF received a TCMHC visit.
7. By September 2017, 30% (target) of clinical staff whose patients received a TCMHC visit were to rate their satisfaction with TCMHC services as either *very aware/satisfied*

or *completely aware/satisfied*, using a modified CSAT-CM (Hsieh, 2006) online survey.

8. By September 2017, 30% (target) of clinical staff whose patients received a TCMHC visit were to participate in the modified CSAT-CM (Hsieh, 2006) online survey.
9. By September 2017, 30% (target) of patients, families, and caregivers who received a TCMHC visit were to participate in a 30-day postvisit telephone survey.
10. By November 2017, the goal of reducing unplanned 30-day hospital readmissions by 2%, compared with baseline, using third party software, was calculated.
11. By December 2017, 100% of visits were billed to Medicare, and average reimbursement was determined.

Timeline. This pilot project followed a structured timeline (see Appendix H for timeline). The pilot project started with discussions among stakeholders on a workflow that participants could use as a guide. Current and existing transitional care models were explored and incorporated into the project's overall approach.

The implementation phase occurred over 4 months, during which time data points were tracked. At the end of 4 months, the data points were collated and analyzed. During the implementation phase, the project averaged one to two TCMHC visits per work day. At the end of the implementation phase, all data underwent statistical analysis. Patient and client confidentiality was strictly maintained throughout the pilot project.

Measures. A convenience sampling method was used for this pilot project which comprised Medicare patients who were referred for TCMHC visits from medical groups, SNFs and HHAs. Patients who had been discharged from a SNF were given a LACE Index score (Wang et al., 2014), which was a reliable and validated instrument. As defined by

Niewiadomski (2015), “The LACE Index identifies patients that are at risk for readmission or death within 30 days of discharge. It incorporates four parameters” (para. 3).

The letter *L* stands for the length of stay of the index admission; *A* stands for the acuity of the admission, specifically, if the patient is admitted through the Emergency Department vs. an elective admission; *C* stands for co-morbidities, incorporating the Charlson Comorbidity Index; *E* stands for the number of Emergency Department visits within the last 6 months (Niewiadomski, 2015, para.4)

Patients with a LACE Index score of or greater than 10 were considered at high risk of unplanned ED visits. Permission to use the instrument (see Appendix I for LACE Index scoring tool) was granted by the author (see Appendix J for consent to use LACE Index scoring tool).

During each TCMHC visit, the NP provided patient education, medication reconciliation, management, prevention or early treatment of infection, and chronic care management. All activities during the visit were documented using a tracking worksheet (see Appendix K for point-of-care data tracking worksheet). In addition, the NP wrote orders as requested by HHA nurses, the pharmacy, and others.

To measure the satisfaction of HHA nurses who conducted home health visits in collaboration with the NP, HHA nurses were emailed a link to complete an eight-item SurveyMonkey® questionnaire on the project. This systematic survey, adapted from Hsieh’s (2006) validated survey instrument, was used to gather and measure baseline data (see Appendix L for modified CSAT-CM). In addition, the project administrator telephoned patients, families, and caregivers after TCMHC visits to determine commonalities in baseline data on their experiences with the program. See Appendix M for consent to use CSAT-CM instrument.

Measures to indicate completion of outcomes were indicated by (a) the workflow of the TCMHC project (Outcomes 1, 2, 3), (b) the report on 30-day hospital readmissions (Outcomes 4, 6, 10), (c) point-of-care data points tracking (Outcome 5), (d) the SurveyMonkey® report (Outcomes 7, 8), (e) the results of follow-up telephone calls (Outcome 9), and (f) the report on Medicare billing and reimbursement (Outcome 11). Measures for Outcome 5 included

1. *Average number of days to visit patients.*
2. *Common distribution of scores* for length of stay, acuity, comorbidities, and ED visits (LACE Index).
3. *Management of polypharmacy through medication reconciliation* (a comparison of medications prescribed on discharge from a hospital or SNF with medications taken after visits).
4. *Prescription medications* (the number of visits that required prescriptions, including refills).
5. *Chronic conditions* such as chronic kidney disease, chronic obstructive pulmonary disease, dementia, diabetes mellitus, heart failure, and hypertension.
6. *Primary care providers* (the number of patients without a primary care provider at the time of visits or the number of patients with a primary care provider, whose follow-up visits were scheduled in less than 7 days, within 7 days, within 14 days, or more than 14 days).
7. *Readmission of patients* within 30 days of discharge from a SNF.
8. *Predictors of readmission*, data points that predicted readmission to the hospital.

Analysis. The qualitative and quantitative methods that were used to describe how program outcomes were met can be found in Appendix N outcomes evaluation table.

For Outcomes 1, 2, and 3, a signed memorandum of understanding and the TCMHC workflow were the instruments used to determine that these outcomes were met. The information in the TCMHC workflow was used as a guideline for project implementation and helped determine milestones accomplished during implementation.

To meet Outcomes 4 through 6, software and a point-of-care tracking worksheet documented the following point-of-care data points: number of days to see patients, LACE index scores, polypharmacy, need for prescriptions, PCP appointments, and comorbidities. Descriptive statistics such as counts, percentages, averages, means and standard deviations were used.

Descriptive and inferential statistical tests were used to the point-of-care data to determine relationships among the data points gathered. Averages and standard deviations were used, but in cases where there were outliers, the median was used to maintain reliability of the data. A Mann-Whitney U test was conducted to compare point-of-care data, such as the medications before and after visits, to determine if there was a statistically significant difference.

To determine whether the project affected readmission rates (Outcome 4), a statistician was consulted. A power analysis was used to determine if the sample size was significant to detect whether there was a correlation between readmission rates. Binomial logistic regression was performed to ascertain the effects of the different data points during visits on the likelihood that patients were readmitted to the hospital within 30 days. In addition, a one-proportion z -test was also used to determine if readmission rates differed from the California benchmark rate.

The logistic regression model was not statistically significant, $\chi^2(13) = 11.681, p = .554$. This indicated that the independent variables in this project were not good predictors of the likelihood of patients being readmitted within 30 days. This phenomenon may have occurred

because the sample size of valid responses for the model was too small to detect whether the slope of the predictors was significant to the readmission rate.

To measure nurse and patient satisfaction (Outcomes 7, 8, and 9), descriptive statistics were used to describe nursing satisfaction with the TCHMC. Unfortunately, the nurses response (Outcome 7 and 8) and patient/family/caregiver response (Outcome 9) were too low to reliably report.

Outcomes 7 and 8 had a response rate (19.2%) which was well below target for HHA nurses modified CSAT-CM survey using SurveyMonkey®. The survey contained a total of eight questions on TCM, on awareness (two questions); on satisfaction (two questions); and on importance (four questions).

The patient/family/caregiver survey data (Outcome 9) was not included in this report because it lacked reasonable merit (3.4% response rate).

Outcome 10 (readmission reduction by 2%) was not met. Analysis was done using third-party software to extract data from the home health readmission rate of the patients who were recipients of TCMHC visits.

Outcome 11 was met and measured using Medicare billing software to gather data on Medicare reimbursements for TCMHC visits. Nominal data (averages) were determined.

Ethical considerations. This quality improvement project was reviewed and approved by the Boise State University Institutional Review Board (see Appendix O for Institutional Review Board Approval). Adherence to the Health Insurance Portability and Accountability Act was of particular importance (Hall & Roussel, 2014; U.S. Department of Health & Human Services, n.d.; Wood & Ross-Kerr, 2006). Data collection was conducted anonymously; no client information was linked to the data.

Conflicts of interest. The author is affiliated with and is the medical house call NP for the host organization. His professional affiliations were disclosed and did not affect the project's results.

Biases. Attrition bias was a concern in maintaining the sample's initial size. Measures to control loss of data from attrition were implemented by using a data points tracking system.

Threats to quality. Professional colleagues reviewed this quality improvement project. Peer-review was essential to assure quality control throughout the project's development, implementation, and analysis (Sandström et al., 2011; Wood & Ross-Kerr, 2006). Alternative explanations to changes in the project's outcome, which were not explored, were additional threats to internal validity.

Results

Outcomes 1, 2, and 3 were met by developing a workflow plan for the TCMHC project. The workflow plan, developed originally as step-by-step guide to implementation of the intervention, evolved over time. Before implementation, data points (e.g., how many medications were in the discharge plan of care compared with medications in the home, including the medication cabinet) were included for statistical analysis. These data points were developed based on Meleis' theory (2010) of the interplay of multiple factors in transitions. These contextual elements were an integral part of the TCMHC intervention, as shown statistically (polypharmacy) as significant in the clinical outcomes (reduction of polypharmacy).

The data measures of the intervention's processes and outcomes proved to be challenging. The HHA nurses' response rate (Outcomes 7, 8) and the patients, families, and caregivers' response rate (Outcome 9) were below the target goal of 30%. This aspect of the

pilot project bears further exploration. Future studies of client satisfaction (both nurses and patient/family/caregivers) with a TCMHC program are warranted.

The project adhered to a target budget and actually saved on projected expenses because the project administrator and NP doing the TCMHC visits donated his time.

Data for 145 patients were reviewed and analyzed. The outcomes and interpretation are discussed below. These results correspond to Outcome 5 (tracking point-of-care data points) of the logic model. Outcome 4 was met, having been able to generate a readmission rate after the pilot project period.

Outcome 5 was met, which comprised documentation of significant activities that were essential components of the TCMHC visit and included number of days to see patients, LACE Index scores, the number of medications used before and after visits, need for prescriptions, PCP appointments, and comorbidities. The following describes the result of Outcome 5.

Average Days to See Patients

Most patients were seen just over a week ($M = 9.5$ days; $SD = 5.3$; 95% CI [8.6, 10.3]). However, two patients were considered to be outliers because it took an unusually long time to visit them compared with typical patients. In this case, the median was seen to be a more accurate indicator: The typical patient took 8.5 days to be seen (see Appendix P for histogram of average days to see patients).

LACE Index Scores

Data on the distribution of LACE Index scores were generated from 59 valid responses (20.3%); 86 patients did not receive LACE Index scores and were considered missing responses. In terms of the distribution, the most common score was 15 ($M = 12.6$, $SD = 2.9$, 95% CI [11.8, 13.3]). See Appendix Q for histogram of LACE Index scores.

Polypharmacy

Based on data from 140 valid responses out of 145 possible responses, the average number of medications listed on hospital or SNF discharge instructions before visits was 18.4 ($SD = 7.4$). After visits (medication reconciliation), the average number of medications was 11.7 ($SD = 6$). However, based on box plot analysis, one outlier was identified before visits, and three outliers were identified after visits. For this reason, the median was considered to be a more accurate measure. The median number of medications before visits was 17; the median number after visits was 11. A Mann-Whitney U Test was conducted to compare before visits with after visits to determine if a statistically significant difference existed. The median number of medications was statistically significantly lower after visits ($z = -7.497, p < .001$). See Appendix R for histogram of polypharmacy.

Need for Prescribed Medications

Based on 145 valid data points, 89 (61.4%) patients required no prescribed medications, 31 (21.4%) required one, 12 patients (8.3%) required two, 8 (5.5%) patients required three, and 5 patients (2.3%) required four or more prescriptions at the time of their visit (see Appendix S for histogram of visits requiring prescriptions).

Primary Care Provider Visits

All 145 patients had a primary care provider at the time of their TCMHC visit. Based on Medicare TCM guidelines (i.e., a PCP visit within 7-14 days after discharge), 4.8% of patients were within the Medicare guidelines and had an appointment with their PCP in fewer than 7 days, 22.8% had an appointment within 7 days, 13.1% had an appointment within 14 days. Most, however, fell outside of Medicare guidelines (59.3%); they were unable to see their PCP

for at least 14 days after discharge (see Appendix T for primary care provider visits). This situation could delay access to care and other essential medical services.

Comorbidities

The type and number of comorbidities including chronic kidney disease, chronic obstructive pulmonary disease, dementia, diabetes, heart failure, and hypertension were tracked among the 145 patients. The most common comorbidity was hypertension ($N = 103$; 71%); 37 (25.5%) reported having at least two comorbidities (see Appendix U for frequency of chronic conditions; Appendix V for histogram of comorbidities).

Unplanned 30-Day Readmissions to the Hospital

HHA data on unplanned 30-day readmissions to the hospital indicated that 19.2% of the 145 patients who received a TCMHC visit were readmitted to the hospital within 30 days. A one-proportion z -test was conducted to determine if the observed readmission rate differed from the Sacramento benchmark rate of 17%. No statistical significance was found, $z = 0.957$, $p = .339$. A one-proportion z -test was conducted to determine if the observed readmission rate differed from the California benchmark rate (18.5%). No statistical significance was found, $z = 0.597$, $p = .551$.

Predictors of Readmissions

Although not part of the outcomes measures but anticipating that some patients in this sample might be readmitted to the hospital within 30 days, a binomial logistic regression was performed to ascertain the effects of all the point-of-care data points (average days to see patients, LACE Index scores, prescribed medications, the number of chronic conditions, the types of chronic conditions, and primary care provider visits). The logistic regression model was not statistically significant, $\chi^2(13) = 11.681$, $p = .554$. This indicated that the independent

variables in this sample were not good predictors of patients being readmitted within 30 days. This phenomenon could be attributed to that fact that all of patients in the sample received a TCMHC visit, and there was no control group for comparison.

Heart failure as a predictor. This result was not part of the logic model outcomes. It emerged from the data quite unexpectedly. A binomial logistic regression was performed to ascertain the effect of any chronic condition on the likelihood that patients were readmitted to the hospital. Heart failure was statistically significant, $\chi^2(1) = 3.172, p < .10$. The model explained 6.4% (Nagelkerke R²) of the variance in hospital readmissions and correctly classified 80.8% of cases. Heart failure was a significant predictor at $p < .10$

Patients with heart failure are 5 times more likely than patients without heart failure to be readmitted to the hospital. However, the model and predictor variable were not significant at the $p < .01$ level; this was deemed unfit for statistical significance in medical-related research.

Outcome 6 was met and related to having more than the target 75% (145 out of 175 referrals) of eligible and consenting patients who were discharged from SNF discharges received a TCMHC visit.

After each 30-day cycle, it was a challenge to get both HHA nurses and patients, their family, and/or caregiver to respond via online or telephone survey to gather feedback on the TCMHC visits. Outcomes 7 and 8 returned five responses of the targeted 26 respondents (19.2%), which was well below the target 30%. On closer examination, the responses were split.

When respondents were asked how aware they were of transitional care services, their responses were split: 50% (*unaware*), 50% (*very aware*). When asked how aware they were of TCMHC services, 40% said *unaware*, 20% said *barely aware*, and 40% said *very aware*. When asked how satisfied they were with their primary care provider's responsiveness to their

questions, 20% reported *completely satisfied*, while a total 60% reported *unsatisfied* and *barely satisfied*. When asked the same question about the TCMHC provider, 80% reported *not applicable* and 20% reported *completely satisfied*. It could be surmised that most respondents did not interact with the TCMHC during the pilot period. When asked their opinion of transitional care services, 60% responded *extremely important* and *very important*; 40% took a neutral position. When asked about the importance of TCMHC services, the same 60-40% split was noted. When asked how important it is to get responses from providers (MDs, NPs, PAs), 80% of respondents reported *extremely important* and *very important*. Finally, when asked how important it was to get responses from the TCMHC team, 80% responded *extremely important* and *very important*; 20% said the question did not apply to them. See Appendix W for the modified CSAT-CM survey results.

Outcome 9 was not met due to the low response rate (3.4%), which was below the target of 30%; the data were deemed inappropriate. This aspect of the pilot project bears more study.

Outcome 10 was not met. The readmission rate was 19.2%, which was 2% higher than state and federal benchmarks. The readmission rate data were not statistically significant. The project group's readmission rate was attributed to the fact that most had a LACE Index score greater than nine, which means most patients in this population were sicker and were high readmission risks. This is another area that should be explored in future quality improvement projects or research.

Finally, no program can be sustainable and scalable if it cannot be financially sound. Outcome 11 was met; all visits were billed to Medicare and generated an average of \$100 per visit for the host organization. Project expenses were lower compared with projected expenses, in large part because actual implementation was reduced from 6 to 4 months. No external

funding was required to support this pilot project (see Appendix X for statement of operation; Appendix Y for preliminary budget; and Appendix Z for 5-year budget).

Discussion

This pilot project met its target outcomes in the logic model except for outcomes measurements involving readmission rate, HHA nurses as well as patients, families, and caregivers for awareness, satisfaction and importance. Outcomes 1, 2, 3, 4, 5, 6, and 11 were met. Extraneous variables played a part in the response or lack thereof to survey instruments (Wood, et al, 2006) that can be turned into opportunities for future study development.

The overall results of the pilot project, however, point to the significant role a provider with prescriptive authority can play in a TCMHC model. The pilot project has shown that transitional care patients have higher acuity and thus are more susceptible to readmissions. Coupled with the information that patients in transition take about 14 days or more to see their PCP, a provider with prescriptive authority can be of great benefit to them. Additionally, Outcome 5 showed significant statistical results in addressing polypharmacy during the transition of care from hospital to home. In the context of Meleis' theory (2010) of transitions, this is significant because individuals during transitions are vulnerable.

Patients were seen by the NP in approximately 8 days from the time of referral. For most patients with a high readmission LACE Index score of 15, a TCMHC visit can address the high readmission risk. The findings that a significant number of patients had at least one or two comorbidities, heart failure being one of them, compound the need to strengthen home-based primary care. According to Gabayan et al. (2015), a 7-day time frame is recommended because prior studies have shown that adverse events occur within that time frame after ED discharge and

that more adverse events occur if the time frame is even longer. This pilot project can be improved upon by ensuring a visit within 7 days after discharge from a hospital or SNF.

Addressing polypharmacy proved to be a significant result in this project. Polypharmacy increases the risk of readmission, as shown in recent studies (Ahmed & Pearce, 2010; Hamar et al., 2016; Levine et al., 2012; Stall et al., 2014; Towne et al., 2014). House call providers with prescriptive authority, in collaboration with a multidisciplinary team, offer a strategic solution to polypharmacy because medications can be adjusted without delay. Additionally, although most patients (61.4%) did not require a prescription during TCMHC visits, 47.5% of the sample required at least one or more prescriptions. The intervention, a visit by a provider with prescriptive authority, avoids delay in refilling prescriptions. The need for prescriptions is compounded by the finding that most TCMHC patients (59.3%) could not see their primary care provider for at least 14 days. This finding affects systems redesign and has implications for policy development.

This project tested the applicability of a TCM model paired with an NP-conducted medical house call visit. It supports current literature and has generated data that may be used for future quality improvement projects. The project itself can be refined to generate further data points to advance patient care, specifically for homebound older adults.

Impact on Systems Redesign and Implications for Policy Development

The project results support strengthening home-based primary care by NPs with special focus on transitions of care. Policy development to encourage more NPs to practice in this subspecialty, thereby increasing access to medical care for homebound older adults, can decrease unplanned 30-day readmissions to the ED or hospital and reduce burgeoning health care costs for this underserved population.

Summary

The goal of this quality improvement pilot project was to apply evidence-based practice on TCM to improve transitions of care.

Interpretation

This project showed that patients who have been discharged from a higher level of care (e.g., a hospital or SNF) can benefit from a TCMHC program within the Medicare-specified transitional care period of 7-14 days. As the participants' LACE Index scores (Wang et al., 2014) showed, scores greater than 9 indicated a higher risk of readmission. Participants scored between 11-15 points, which meant that all were at high risk of readmission. Results also showed a significant reduction in polypharmacy, a significant and encouraging outcome. Polypharmacy is a significant issue especially in the older adult population. Reducing the number of medications older adults take also reduces the possibility of adverse interactions. Older adults, by virtue of their age, general health, and physical decline, would benefit from a reduction in polypharmacy.

In addition, almost half of patients seen during the TCMHC program required at least one prescription. A provider with prescriptive ability like an NP is best suited for this type of a visit in collaboration with HHA nurses. Failure to fill or refill just one essential medication could mean a trip to the ED. Because half of this project's participants were unable to see their primary care provider for at least 14 days after discharge from a SNF, a provider with prescriptive authority was a critically important component of this TCMHC program.

This project's results support the conclusions of published literature (Gabayan et al., 2015; Naylor et al., 2004; Wang et al., 2007) that heart failure increases the risk of frequent visits to the ED or readmission to the hospital. Hypertension was the most common comorbidity found

among this project's participants. The fact that more than half of participants had at least two comorbidities emphasizes the need for a provider with prescriptive authority who is readily available to patients, families, and caregivers and for HHA nurses who follow homebound patients after discharge from a hospital or SNF.

Burgeoning Medicare expenditures for unplanned 30-day readmissions to EDs and hospitals (Hamar et al., 2016; Stall et al., 2014; Towne et al., 2014) coupled with the functional decline (Hamar et al., 2016; Levine et al., 2012) that is characteristic of homebound older patients who require readmission can be addressed by strengthening transition of care capabilities (Burton, 2016). Health care policies should be advanced that strengthen home-based primary care; one such policy is allowing NPs full practice authority (in applicable states), especially those engaged in transitions of care. This should encourage more NPs to pursue this subspecialty because of its practice, administrative, and fiscal soundness. Granting NPs in home-based care full practice authority erases the fees they pay for physician supervision, which has limited their participation in home-based primary care and their ability to expand their practices.

Implied in such policy development is allowing NPs to sign certification and recertification of home health orders to further reduce unplanned 30-day hospital readmissions through TCM. This policy would eliminate delay in start of service for HHAs and improve access to care for homebound older adults.

Limitations

Because this was a quality improvement project and not a research project, its generalizability may be limited by its relatively small sample size ($N = 145$) and lack of a control

group. Varying conditions contributed to the readmission rate of this sample, the most important being that most patients had a high LACE Index score.

Other factors that might have limited internal validity (e.g., confounding; bias; or imprecision in design, methods, measurement, or analysis) were addressed by using statistical analysis to extract significance and noting that such significance does not relate to medical research. Finally, this project's results may prove valuable for future quality improvement projects or additional research.

The relatively low response rate to the modified CSAT-CM and telephone surveys of the HHA nurses and the patients/family/caregivers were deemed a limitation to some of the outcomes measurements. These findings, however, present an opportunity to further explore this specific focus in future quality improvement projects. The results of this project are consistent with findings of other publications such as heart failure as a predictor of readmission (Naylor, et al., 2014). The impact of this project on vulnerable, homebound older adults cannot be overemphasized. The project contributes knowledge to systems redesign as it impacts Medicare's readmission reduction program and hopefully stimulates policy development in this field.

Conclusion

Adding medical house calls as a component of TCM is an alternative way to assist vulnerable, homebound older adults who are susceptible to frequent admissions and readmissions to EDs and hospitals. Medicare reimbursement policy accounts for TCM, allowing the use of CPT codes 99496 for visits within 7 days or 99495 for visits within 14 days, based on CMS guidelines (2016). This is a sustainable and scalable program when one understands that Medicare reimbursement is \$180 per NP visit (Smith et al., 2016). An NP, in collaboration with

a multidisciplinary team of physicians and medical groups, home health professionals (i.e. nurses, rehabilitation therapists, and social workers) can provide comprehensive and coordinated care in a home-based, primary care practice. A TCMHC program can effectively address polypharmacy, prescription medications (including refills), chronic disease management (especially for heart failure patients), and coordination of care. With additional refinements to this pilot project, replicable models of TCMHC programs can be developed. The implications for practice and further study in the field suggest dissemination of this project's results and encouragement for more studies on the subject.

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Appendix A

Evidence Table

Article No.	Author(s) and Date	Evidence Type	Sample Sample Size Setting	Answers to Questions on Evidence-Based Practice	Limitations	Evidence Level & Quality
1	Levine et al., 2012, American Journal of Managed Care.	Randomized controlled trial (RCT)	Managed care patients. mean age 80.8 years. $N = 298$. Los Angeles County. .	Home-based primary care (HBPC) increases patient satisfaction; lowers emergency department (ED) or hospital readmission.	Small sample size, used proxy cost, insignificant results on cost.	Level I High Quality (A)
2	Stall et al., 2014, Journal of American Geriatrics Society	Systematic review	Managed care patients. mean age ≥ 65 years. $N = 46,154$.	HBPC for homebound seniors reduced ED visits, reduced hospital admissions, decreased in-patient days, decreased long-term care (LTC), decreased cost. The study provided overview of different models of home-based care.	Publication bias and potential for incomplete identification of relevant studies. Only one study was RCT, eight observational, and four programs descriptions.	Level II Good Quality (B)
3	Hamar et al., 2016, American Journal of Manage Care.	Quasi-experimental	Intervention group $n = 560$. Control group $n = 3,340$. 14 acute care hospitals in Texas Health	Care Transition Solution (CTS) program significantly reduced readmissions for readmission-sensitive diagnoses:	Retrospective design, convenience sampling as opposed to prospective	Level II High Quality (A)

			Resources Network, (managed care).	AMI, COPD, HF, and PNA.	selection and randomization.	
				A scalable and sustainable approach in the transition from hospital to home.		
				This study touched on the scholarly project's focus: transitional care in a home-based model of care.		
4	Goldman et al., 2014, Annals of Internal Medicine	RCT	Adults ≥ 55 years. $N = 700$. Safety-net hospitals in San Francisco Bay Area.	Control: RN discharge instructions Intervention: RN discharge instructions + NP follow up call. Focus: non-English speaking patients. Results: No statistical significance in reduction of ED readmissions. This study helped answer the EBP question. It showed that hospital discharge by itself is inadequate in preventing readmissions. HBPC or a TCMHC program is an important and	Limited home visits by medical provider. Patients were being seen by regular PCPs. No integration of services (e.g. RN not empowered). No all ED visits were captured, statistical data had low power.	Level I Good Quality (B)

often necessary adjunct
to minimize
readmissions.

This study provided
insight into
coordination of
inpatient discharge to
the transition to the
community—a gap
that can be filled by
the TCMHC model.

5	Gabayan et al., 2015, Journal of American Geriatrics Society	Meta-analysis	Older adults ≥ 65 years discharged from ED of 284 hospitals. $N = 505,315$. General, acute, nonfederal hospitals in California.	Outcome measure: unscheduled admission to hospital within 7 days of discharge: 4.6% due to: leaving against medical advice, residents at skilled nursing facilities (SNFs), chronic conditions, (CHF, CRD, ESRD), Non-Hispanic whites. This study provided insight into the 7-day target visit for the transitional care program.	Data derived from ICD-9 codes (retrospective billing). Data source (OSHPD) does not provide federal data (not generalizable). California is 12% of US population (not generalizable). Data regarding preexisting comorbidities lacking.	Level III Good Quality (B)
6	Ornstein et al., 2011	Quality	81 years old mean age.	HBPC addressing	Cost of the	Level V

	Journal of American Geriatrics Society	improvement program	<i>N</i> = 1,467. MSVD Program, New York.	transitional care needs. NP-led HBPC program feasible in enhancing inpatient management and transitional care 16% readmission rate ($p = .71$). This study provided insight into an NP-led HBPC doing transitional care model.	program is deterrent to duplication (15 MDs; 2 NPs) The NPs, aside from home visits, also do hospital rounds.	Good Quality (B)
7	Wilson & Bachman, 2015, Social Work in Health Care.	Retrospective comparative case study	272 cases. 832 controls. Database 2004, 2005, 2006 of Medicare utilization and payment using private data management.	Coordinated care for patients with Alzheimer's and dementia patients has potential to reduce cost by increasing use of hospice services, thereby preventing unplanned readmissions to ED/hospital). This study provided insight into management of homebound seniors with Alzheimer's disease and dementia, care coordination, palliative care, hospice services and end-of-	Case study focused on social services.	Level V Good Quality (B)

				life care.		
8	Ouslander et al, 2012, Journal of American Geriatrics Society	Literature review	N/A	Identified 250 relevant measures from literature review: hospital admissions from community, nursing homes, and hospital readmissions.	This article merely defines potentially preventable hospitalization.	Level V Good Quality (B)
				This article provides insight into measures that may be applied to LTC population as a potential target population when discharged into the community for the TCMHC scholarly project.		
9	Walker et al., 2007 American Journal of Nursing.	Clinical practice guidelines	N/A	Outlined models of discharge planning with five practice models including ACE and NICHE.	Focused on hospital-based approach. Only one model has a transitional care approach (practice improvement cluster).	Level IV Good Quality (B)
				This paper served as springboard reference for the development of practice workflow for the TCMHC scholarly project.		
10	Naylor et al., 2010, The Commonwealth	Clinical practice guidelines	N/A	Development of transitional care	The scalability of the model	Level IV High

Fund.

management (TCM) model and bringing it to scaling it for broader use among stakeholders: like private insurers and public payers. The model has been shown to improve quality of care and reduce cost. This model provides the clinical practice guidelines and specific approaches to the program.

requires systems change and payment policy changes, (for private insurers as well as Medicare).

Quality (A)

11	Coleman et al., 2006, Archives of Internal Medicine	RCT	<i>N</i> = 750. Large integrated health care delivery system in Colorado	Transitions coach (advanced practice nurse). Intervention: patients get a transitions coach. Results measured at 30, 90, 180 days. Lower readmissions at 30 days (<i>p</i> = .048) and at 90 days (<i>p</i> = .040). Lower cost (<i>p</i> = .049).	Cost effectiveness beyond scope of study which may not have taken into account un-measurable costs.	Level I High Quality (A)
12	Society of Hospital Medicine, 2010	Clinical practice guidelines	N/A	Teach Back: protocols and systems used as implementation guide before discharge to improve care transitions	Hospital-focused intervention	Level IV High Quality (A)
13	Geary & Schumacher,	Theoretical	N/A	Meleis' transitions		Level IV

	2012, Advances in Nursing Science	framework. Clinical practice guidelines		theory served as contextual framework for the project.		High Quality (A)
14	Smith et al., 2016 Journal for Nurse Practitioners	Quasi-experimental, case-control study	<i>N</i> = 532. Post acute care transition (PACT) home visit. Kaiser Permanente, Denver, CO.	LACE Index used to triage. 42% and 53% lower than control Medicare readmission. Cost = \$9,000-\$15,000, depending on diagnosis. Single NP visit approx. \$180 per visit	Done in a single hospital of a managed care system where clinicians have access to data from one source.	Level II High Quality (A)
15	Kutzleb et al., 2015, Nursing Economics.	Quasi-experimental, case-control study.	N/A <i>N</i> = 312.	IOWA model, HF patients, APNs- NP care model 30-day readmission dropped from 26% to 8%. Cost dropped to \$311,818 (from \$1,019,405). Four-day admission for HF patient = \$11,993. Readmission rate 26% (average 15-22%)	Focused on HF patients, hospital based.	Level V High Quality (A)
16	Stanik-Hutt et al., 2013, Journal for Nurse Practitioners	Systematic review	N/A	Years 1990-2009. 27, 993 articles summarized into 11 aggregated outcomes Comparison NP-MD on patient outcomes,	Heterogeneity of study designs and measures, multiple time points for	Level II Good Quality (B)

				satisfaction with care, health status, functional status, number of ED visits, and hospitalizations = found comparable	measuring outcomes, limited randomized designs, inadequate statistical data for meta-analysis.	
17	Naylor et al., 2004, Journal of American Geriatrics.	RCT	HF patients. N=239 Six Philadelphia hospitals.	HF patients followed by APNs, readmission reduction, cost reduction.	Hospital to home, HF cases only.	Level I High Quality (A)

Note: AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; HF = heart failure; PNA = pneumonia; RN = registered nurse; NP = nurse practitioner; EBP = evidence-based practice; TCMHC = Transitional Care Medical House Calls Program; PCP = primary care provider; CHF = congestive heart failure; CRD = chronic respiratory disease; ESRD = end stage renal disease; OSHPD = Office of Statewide Health Planning and Development; MSVD = Mount Sinai Visiting Doctors Program; MD = medical doctor; ACE = acute care for the elderly unit; NICHE = Nurses Improving Care for Health system Elders; APN = advanced practice nurse.

Appendix B

Synthesis of Evidence

Category (Level Type)	Total Number of Sources/Level	Overall Quality Rating	Synthesis of Findings Evidence That Answers the EBP Question
Level I Experimental study. Randomized controlled trial (RCT) Systematic review of RCTs with or without meta-analysis.	3	A,B	Strong evidence suggests that home-based primary care (HBPC) lowers hospital readmission. This evidence provides patterns or models of care for the scholarly project. There is a need to focus on home-based and community-based care because evidence suggests hospital discharge process can benefit from the addition of such care in preventing readmissions. In-home follow-up care provided by HBPC or transitional care visits is a significant addition. These studies provided insight into coordination of inpatient discharge to transition to the community - a component well-suited to a TCMHC model of care.
Level II Quasi-experimental studies. Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis.	2	A,B	HBPC focused on homebound seniors to reduce ER visits, reduce hospital admissions, decrease inpatient days, decrease long-term care (LTC) days, ultimately decreasing cost. Different models of home-based care were explored in the implementation of the scholarly project. The Care Transition Solution (CTS) program is one such model, and evidence has shown that it significantly reduces readmissions for readmission-sensitive diagnoses such as chronic heart failure, chronic obstructive pulmonary disease, and pneumonia among others. There is a scalable and sustainable approach in the transition from hospital to home. The scholarly project focused on transitional care in a home-based model.
Level III Non-experimental study. Systematic review of a combination of RCTs, quasi-experimental, and	1	B	A systematic review provided insight into the 7-day target visit for the transitional care program.

non-experimental studies, or
non-experimental studies
only, with or without meta-
analysis.
Qualitative study or
systematic review of
qualitative studies with or
without meta-synthesis

Level IV Opinion of respected authorities and/or reports of nationally recognized expert committees/ consensus panels based on scientific Evidence.	3	A,B	Outlined models of discharge planning with five practice models including Acute Care for the Elderly and Nurses Improving Care for Health System Elders. These papers served as springboard references for the development of workflow for the TCMHC scholarly project. Development of the transitional care management (TCM) model and bringing it to scale for broader use among stakeholders like private insurers and public payers. The model has been shown to improve quality of care and reduce cost and provided the clinical practice guidelines and specific approaches to the project. A teach-back method can be implemented as part of the TCMHC protocol.
Level V Evidence obtained from literature reviews, quality improvement program evaluation, financial evaluation, or case reports. Opinion of nationally recognized expert(s) based on experiential evidence.	3	B	NP-led HBPC program is a feasible option in enhancing inpatient management and transitional care in preventing readmissions. If care is coordinated for patients with Alzheimer's disease and dementia, it has the potential to reduce cost by increasing use of hospice services, thereby preventing unplanned readmissions to the ED and hospital. These studies provided insight into management of homebound seniors with Alzheimer's disease and dementia, care coordination, palliative, hospice services, and end-of-life care. Measures were considered for the TCMHC program in determining effectiveness.

Recommendations Based on Evidence Synthesis and Selected Translation Pathway

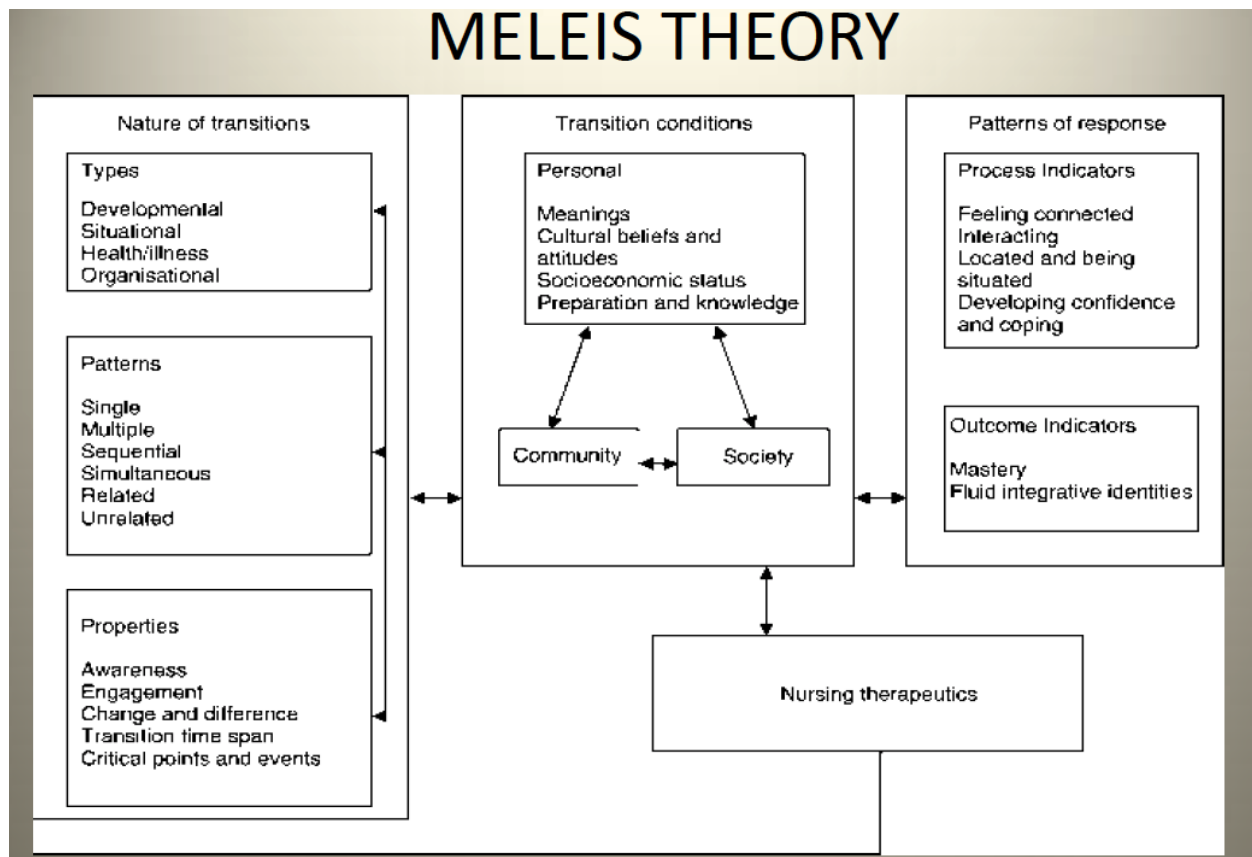
Strong, compelling evidence and consistent results support the inclusion of medical house call visits by nurse practitioners to

complement TCM. Evidence supported 30-day readmission reduction by implementing coordinated TCM that includes home-based care. The TCM model provided the clinical practice guidelines for the scholarly project. Fundamental changes in the structure, care processes, and roles of advanced practice nurses are necessary. Contribution to systems redesign and payment policy changes were seen as the long-term goals of this scholarly project.

Note: TCMHC = Transitional Care Medical House Calls Program; NP = nurse practitioner; ED = emergency department.

Appendix C

Theoretical Framework



Appendix D

SWOT Analysis

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. Needed service. 2. Medicare covered benefit. 3. Addresses Medicare programs/incentives. 4. Addresses the need of homebound population. 5. Electronic health record capability. 	<ol style="list-style-type: none"> 1. Challenges to house call versus office visit. 2. Challenges to recruitment of nurse practitioner. 3. Logistical needs.
Opportunities	Threats
<ol style="list-style-type: none"> 1. Address an identified need: readmission reduction. 2. Potential partnership with home health, hospitals, health systems, other practices, other stakeholders. 3. Potential partnership with accountable care organizations. 4. Scalability. 	<ol style="list-style-type: none"> 1. Medicare denials of claims. 2. Medicare change in payment structures (will not cover transitional or house calls). 4. Scarcity of duplicated results- less homogeneity. 5. Relatively new model of care.

Appendix E

Memorandum of Understanding

**Senior Care Clinic Medical House Call Services**

89 Lincoln Blvd, Suite 100, Lincoln, CA 95648

Tel (916) 543-1593

Fax (877) 466-7829

MEMORANDUM OF UNDERSTANDING

Between

Ron Ordonia NP/ Boise State University DNP Program (student)

And

Senior Care Clinic House Calls

(A Medical Corporation)

I. Purpose

The purpose of this Memorandum of Understanding (MOU) is to provide a mutually beneficial framework of sharing information for a pilot study on a quality improvement project (QIP), in accordance with Ron Ordonia's Boise State University Doctor of Nursing Practice (DNP) program.

The pilot study is for a quality improvement project related to transitional care medical house call program in support of ER visit/readmission reduction after discharge from skilled nursing.

II. Scope and Objectives

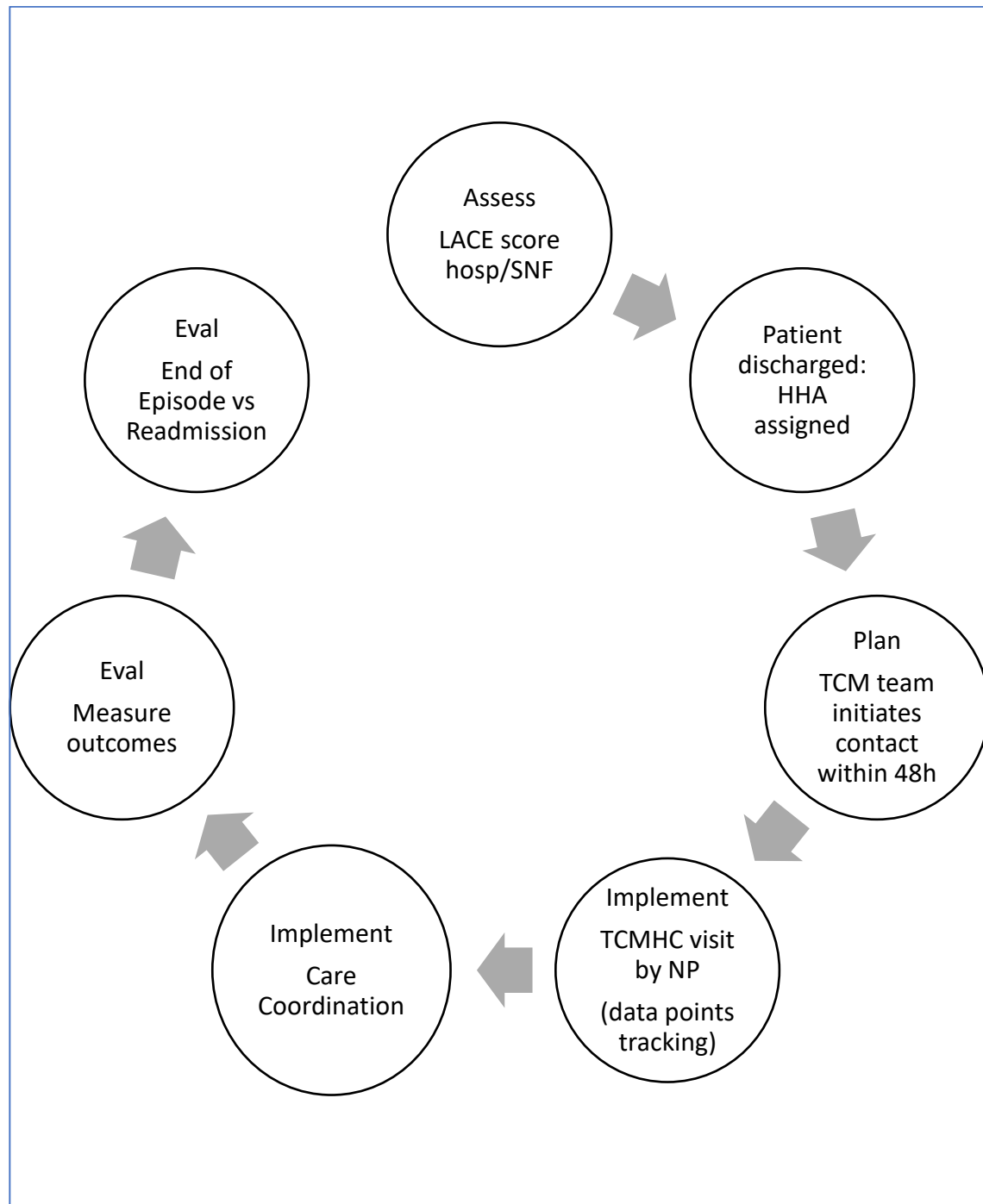
The parties mutually agree to procedures for cooperation as defined in this MOU. Ron Ordonia, NP, as part of his DNP program at Boise State University, will coordinate with parties concerned to develop and pilot test a protocol where Ron Ordonia NP, in collaboration with Progressive Home Health, will see patients discharged from Manor Care Rehabilitation Center for a transitional care medical house call visit.

Ron Ordonia, NP will do activities within his scope of practice such as medication reconciliation, prevent/early treatment of infection, pain management, chronic disease management, and coordination of care (with the Primary Care Provider, home health and other agencies, as applicable). Identify and evaluate results at 30, 60, 90 and 180 days.


Angela Wilson
Office Manager
Ron Ordonia NP
Boise State University DNP student

Appendix F

Workflow for the Transitional Care Medical House Call Project



Appendix G

Logic Model

Resources/ Inputs	Activities	Outputs	Outcomes: Short term	Outcomes: Long term	Impact
Partnerships: Medical house call provider, medical group collaborator, skilled nursing facility (SNF), home health agency (HHA).	<p>Discussion of proposed transitional care medical house call (TCMHC) workflow.</p> <p>Explored Naylor's transitional care management (TCM) model.</p> <p>Explored Coleman's care transitions intervention (CTI) model.</p> <p>Explored Project BOOST model/tools/guidelines.</p> <p>Conducted discussions and synthesis of existing TCM models.</p>	Development of TCMHC workflow by December, 2016.	<p>1. By December 2016, a TCMHC workflow was developed.</p> <p>2. By May 2017, 80% of providers were oriented to the TCMHC workflow.</p>	<p>12. By June 2018, educational meetings will be provided to 50% of interested hospitals, clinics, practices, SNFs or HHAs on the TCMHC project in Sacramento and Placer Counties and in Northern California.</p> <p>13. By May 2018, 50% of eligible patients discharged from participating SNFs in Sacramento and Placer counties receive TCM using the TCMHC workflow through the medical house call</p>	Hospitals, SNFs, and other HHAs explore the TCMHC workflow.

	Identified other potential current initiatives that can be adopted/ modified.			practice and its collaborators.	
	Identified key players in the TCMHC model.				
	Identified logistics/ challenges to implementation.				
	Synthesized a TCMHC workflow.				
	Feedback to faculty advisor(s).				
Clinical collaboration: Medical house call provider, medical group collaborator, SNF, and HHA.	Discuss with providers the TCMHC workflow. Implemented workflow in communication with clinical partners. LACE Index scores were incorporated into the discharge plan. Informed patients, families, and caregivers of TCMHC visits. Determined LACE	Provider(s) gave feedback about workflow during the implementation (May - August 2017).	3. By October 2017, feedback was incorporated into the TCMHC workflow.	14. By 1-2 years, 80% of SNF and HHA clinical staff report awareness and satisfaction with TCMHC using SHP data measured periodically by HHAs and other participating agencies.	Clinical teams develop medical house call practices with implementation of a TCMHC program.

Index scoring: 0-4 low risk; 5-9 moderate risk; > 9 high risk.

Implemented tasks during the medical house call visit: medication reconciliation, medication refills, pain management, prevention or early treatment of infection, chronic care management, coordination of care (HHA, pharmacies, patient's PCP, and others).

Measurements: 1. Data points tracking. 2. 30-day hospital readmission rate for patients who were recipients of TCMHC visit.	Gathered data using third-party software c/o HHA. Evaluated HHA nurses' rating of awareness, satisfaction, and importance as relates to transitional care. Evaluated feedback from patients, families,	Data points tracked and readmission rate measured.	4. By August 2017, readmission rate was determined for the TCMHC recipients using third-party software. 5. By August 2017, data points were tracked to determine point-of-care activities that may be significant to the project.	15. By 1-2 years, an additional matrix for measuring TCMHC effectiveness is developed by multidisciplinary collaborating partners. 16. By 1-2 years, 50% of patients, families, and	Reduction in unplanned 30-day hospital readmissions. Stress reduction for patients, families, and caregivers as relates to unplanned 30-day hospital
---	--	--	--	--	---

and caregivers who were recipients of a TCMHC visit.

The modified CSAT-CM (Hsieh, 2006) survey was administered to HHA nurses.

The open-ended question was included in the HHA post 30-day episode survey.

Issues and concerns addressed during TCMHC visits included, but are not limited to, polypharmacy, prescription of medications (including refills), chronic disease management (especially for heart failure patients), and coordination of care.

Measured and tracked data points during actual visits:

6. By August 2017, 75% of eligible SNF discharges who agreed to the TCMHC visit, receive a TCMHC visit.

7. By September 2017, a target of 30% of clinical staff whose patients were recipients of TCMHC visits to rate their satisfaction of TCMHC services as *very aware/satisfied* or *completely aware/satisfied*. A modified CSAT-CM (Hsieh, 2006) survey was used for this purpose.

8. By September 2017, a target of 30% of clinical staff whose patients were recipients of TCMHC visits participate in the modified CSAT-CM (Hsieh, 2006) survey.

9. By September 2017, a target of 30% of patients, families, and caregivers who were recipients of the TCMHC visit

caregivers report awareness and satisfaction with TCMHC visit using third party software by HHAs and other participating agencies.

17. By December 2018, 80% of Medicare billing show at least \$180 reimbursement per TCMHC visit based on Senior Care Clinic House Calls year-end financial report.

readmissions.

Cost-savings for Medicare.

Sustainable practice initiative.

	1. number of days to see patients 2. LACE index scores 3. Number of medications before and after visit. 3. Need for prescriptions 4. PCP appointments 5. Comorbidities		participate in the 30-day post visit telephone survey. 10. By November 2017, a target 2% reduction, compared with baseline, in unplanned 30-day hospital readmissions is reported for TCMHC recipients based third party software was attempted.		
Financials: Medicare reimbursement	Establish Medicare reimbursement rate with billing company. Ensure timely submission of billing for reimbursements (using CPT code 99495/96). Determine financial sustainability.	Funding to promote sustainability and scalability.	11. By December 2017, 100% of all visits were billed to Medicare and baseline Medicare reimbursement rate for the TCMHC visits done during the pilot project was determined.	19. By December 2018, 80% of Medicare billing showed an average of \$180 reimbursement per TCMHC visit.	Income-generation for the practice that is scalable to practices or health systems. Sustainable practice change initiative.

Note: TCMHC = Transitional Care Medical House Calls Program; SHP = Strategic Healthcare Programs; PCP = primary care provider.

Appendix H

Timeline

Mo/Yr. Activity	5/ 16	6/ 16	7/ 16	8/ 16	9/ 16	10/ 16	11/ 16	12/ 16	1/ 17	2/ 17	3/ 17	4/ 17	5/ 17	6/ 17	7/ 17	8/ 17	9/ 17	10/ 17	11/ 17	12/ 17	1/ 18	2/ 18	3/ 18	4/ 18
Lit Review	X		X						X		X													
Confer Faculty Mentor MOUs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Review TCM Workflow		X	X	X		X			X		X		X		X		X							
Initiate IRB Approval						X	X		X															
IRB approval										X	X													
Executive Session	X											X												X
Project Implemen- tation													X	X	X	X								
Report Develop- ment																	X	X	X	X				
Abstract Submission																			X	X	X			
Final Report																		X	X	X		X	X	X

Note: MOUs = memoranda of understanding; TCM = transitional care management; IRB = institutional review board.

Appendix I

LACE Index Scoring Tool

MR# _____
 UNIT _____
 DOS _____

LACE index scoring tool

Step 1. Length of Stay
 Length of stay (including day of admission and discharge): _____ days

Length of stay (days)	Score (circle as appropriate)
1	1
2	2
3	3
4-6	4
7-13	5
14 or more	7

}

→

L

Step 2. Acuity of Admission
 Was the patient admitted to hospital via the emergency department?
 If yes, enter "3" in Box A, otherwise enter "0" in Box A

A

Step 3. Comorbidities

Condition (definitions and notes on reverse)	Score (circle as appropriate)
Previous myocardial infarction	+1
Cerebrovascular disease	+1
Peripheral vascular disease	+1
Diabetes without complications	+1
Congestive heart failure	+2
Diabetes with end organ damage	+2
Chronic pulmonary disease	+2
Mild liver or renal disease	+2
Any tumor (including lymphoma or leukemia)	+2
Dementia	+3
Connective tissue disease	+3
AIDS	+4
Moderate or severe liver or renal disease	+4
Metastatic solid tumor	+6
TOTAL	

If the TOTAL score is between 0 and 3 enter the score into Box C.
 If the score is 4 or higher, enter 5 into Box C

C

Step 4. Emergency department visits
 How many times has the patient visited an emergency department in the six months prior to admission (not including the emergency department visit immediately preceding the current admission)? _____
 Enter this number or 4 (whichever is smaller) in Box E

E

Add numbers in Box L, Box A, Box C, Box E to generate LACE score and enter into box below. If the patient has a LACE score is greater than or equal to 10 the patient can be referred to the virtual ward

LACE

LACE Score Risk of Readmission: 0 - 4 Low, 5 - 9 Moderate, > 9 High Risk

Appendix J

Consent to Use LACE Index Scoring Tool

From: **Wang, Hao** HWang01@jpshealth.org
Subject: RE: L.A.C.E. instrument
Date: December 14, 2016 at 4:52 PM
To: Ron Ordonia ronordona@u.boisestate.edu

WH

Sure, free to use. Glad to hear it helps your project.

Good luck and best regards,

Hao.

From: Ron Ordonia [ronordona@u.boisestate.edu]
Sent: Wednesday, December 14, 2016 1:59 AM
To: Wang, Hao
Subject: L.A.C.E. instrument

Dr Hao Wang
John Peter Health Network
1550 S. Main St., Fort Worth
TX 76104

I am working on my Doctor of Nursing Practice (DNP) degree with Boise State University. I came across and was very impressed with your work on L.A.C.E. It guides us in prioritizing visits to transitional care clients.

I would like to ask permission to use it as a guide as relates to my project Transitional Care Medical House Call (TCMHC) program.

This work is in progress and I have attached a draft copy of my abstract.

Sincerely,

~Ron

--
Ron Billano Ordonia MSN FNP
Doctor of Nursing Practice student
Boise State University
cell (916) 223-0150

This electronic transmission and any attached files are intended solely for the person or entity to which they are addressed and may contain information that is privileged, confidential or otherwise protected from disclosure under applicable law. Any review, retransmission, dissemination or other use, including taking any action concerning this information by anyone other than the named recipient, is strictly prohibited. If you are not the intended recipient or have received this communication in error, please immediately notify the sender by return email and delete the original message from your system.

Appendix K

Point-of-Care Data Tracking Worksheet

Patient Identifier	2D) Days Avg to See Patient (enter as #)	2E) LACE Score (enter as #)	2F) Polypharmacy Before (enter as #)	2F) Polypharmacy After (enter as #)	2G) Visits requiring prescription (enter as #)	2H) Chronic Conditions (enter CHF, CKD, COPD, Dementia, DM, and/or HTN)	2I) PCP (enter <7d, within 7d, or >14d)	Unplanned 30 Day Readmission (enter Y/N)
TCMHC001	6	0	14	5	0	HTN	>14d	ND
TCMHC002	11	0	23	13	0	HTN, CKD, DM	>14d	N
TCMHC003	6	0	14	8	1	HTN	within 14d	Y
TCMHC004	6	18	12	7	3	no chronic cond	>14d	N
TCMHC005	4	0	18	10	0	HTN, DM, CHF	within 14d	N
TCMHC006	7	15	30	18	0	HTN, COPD, CHF, CKD	within 14d	Y
TCMHC007	5	0	12	12	0	DM, COPD	>14d	N
TCMHC008	7	0	5	3	1	no chronic cond	>14d	ND
TCMHC009	8	0	18	18	0	HTN, DM	>14d	N
TCMHC010	6	14	26	17	0	CKD, HTN, DM, CHF	within 7d	N
TCMHC011	5	15	23	6	0	DM, CHF, HTN, CKD	>14d	N
TCMHC012	3	0	27	10	1	DM, HTN, CKD	<7d	ND
TCMHC013	1	0	5	1	0	no chronic cond	>14d	ND
TCMHC014	5	0	30	16	2	DM, HTN	within 14d	N
TCMHC015	7	13	15	3	0	HTN, Dementia	<7d	N
TCMHC016	4	13	15	8	2	HTN	within 7d	N
TCMHC017	6	11	19	18	3	COPD	within 7d	ND
TCMHC018	3	15	13	10	1	HTN, COPD	>14d	N
TCMHC019	2	0	9	4	0	no chronic cond	>14d	ND
TCMHC020	3	0	5	4	1	HTN	>14d	ND
TCMHC021	13	9	13	8	0	no chronic cond	within 7d	ND
TCMHC022	2	0	12	9	0	HTN	>14d	ND
TCMHC023	12	0	5	4	1	no chronic cond	>14d	N
TCMHC024	5	0	15	8	0	HTN, COPD	within 7d	N
TCMHC025	6	0	10	10	0	HTN, DM	>14d	N
TCMHC026	13	0	18	13	0	DM	within 14d	Y
TCMHC027	6	0	32	29	0	COPD, CHF, HTN, DM	within 14d	Y
TCMHC028	13	0	12	5	0	HTN	>14d	N
TCMHC029	6	0	27	19	1	HTN	within 7d	N
TCMHC030	6	0	13	12	0	DM, CHF, CKD	within 7d	N
TCMHC031	15	13	23	13	0	CHF, COPD, HTN, DM	within 7d	N
TCMHC032	6	8	12	4	0	HTN, Dementia	within 7d	ND
TCMHC033	13	0	15	15	0	no chronic cond	>14d	N
TCMHC034	2	0	ND	ND	0	CHF	>14d	N
TCMHC035	13	0	8	8	0	DM	within 7d	N
TCMHC036	11	15	22	14	1	DM, HTN	>14d	N

Appendix L

Modified CSAT-CM Survey Instrument

Survey on Awareness and Satisfaction

How aware/satisfied are you with the services provided by the transitional care services? Select a number between 1 and 5 to indicate your baseline knowledge or satisfaction: **1 means completely unaware or dissatisfied and 5 means completely aware or satisfied.** If you are neither completely aware/satisfied nor unaware/completely dissatisfied, select 3, which means neutral or just as aware/satisfied as unaware/dissatisfied.

1. How aware are you of transitional care services?

Unaware 1	Barely aware 2	Neutral 3	Very aware 4	Completely aware 5
-----------	----------------	-----------	--------------	--------------------

2. How aware are you of transitional care medical house call services?

Unaware 1	Barely aware 2	Neutral 3	Very aware 4	Completely aware 5
-----------	----------------	-----------	--------------	--------------------

3. How satisfied are you with ability to get responses from the primary care provider?

Completely dissatisfied 1	Barely satisfied 2	Neutral 3	Very satisfied 4	Completely satisfied 5
---------------------------	--------------------	-----------	------------------	------------------------

4. How satisfied are you with ability to get responses from the transitional care medical house call team

Completely dissatisfied 1	Barely satisfied 2	Neutral 3	Very satisfied 4	Completely satisfied 5
---------------------------	--------------------	-----------	------------------	------------------------

Importance Items

Some respondents may feel some areas of the transitional care services are more important than others. What areas do you consider extremely important to you? Select a number between 1 and 5 to indicate the importance of the services: **1 means not at all important and 5 means extremely important.**

5. Transitional care services.

Not at all important 1	Barely important 2	Neutral 3	Very important 4	Extremely important 5
------------------------	--------------------	-----------	------------------	-----------------------

6. Transitional care medical house call services.

Not at all important 1	Barely important 2	Neutral 3	Very important 4	Extremely important 5
------------------------	--------------------	-----------	------------------	-----------------------

7. Ability to get responses from the provider (MD/NP/PA).

Not at all important 1	Barely important 2	Neutral 3	Very important 4	Extremely important 5
------------------------	--------------------	-----------	------------------	-----------------------

8. Ability to get responses from the transitional medical house call team.

Not at all important 1	Barely important 2	Neutral 3	Very important 4	Extremely important 5
------------------------	--------------------	-----------	------------------	-----------------------

Adapted from "Client Satisfaction to Improve Case Management (CSAT-CM)" by C-M Hsieh, 2006, November). Using client satisfaction to improve case management services for the elderly. *Research on Social Work Practice*, 16, 605-612. <http://dx.doi.org/10.1177/1087057106289360>. Used with permission.

Appendix M

Consent to Use CSAT-CM Instrument

From: **Hsieh, Chang-ming** chsieh@uic.edu
Subject: RE: CSAT-CM
Date: December 14, 2016 at 6:18 AM
To: Ron Ordon ronordona@u.boisestate.edu



Dear Ron:

Thank you very much for your message. You are certainly welcome to use CSAT-CM as you see fit. It will be great if you can share your results related to CSAT-CM with me. Thank you again.

Regards,

Chang-ming

Chang-ming Hsieh, Ph.D.
Associate Professor
Director of Doctoral Program
Jane Addams College of Social Work
University of Illinois at Chicago

----- Original message -----

From: Ron Ordon ronordona@u.boisestate.edu
Date: 12/13/2016 11:21 PM (GMT-06:00)
To: "Hsieh, Chang-ming" chsieh@uic.edu
Subject: CSAT-CM

Chang-ming Hsieh, Ph.D.
Jane Addams College of Social Work,
University of Illinois at Chicago, 1040 West Harrison Street
(MC 309), Chicago, IL 60607-7134
e-mail: chsieh@uic.edu

Dear Dr. Hsieh,

I am working on my Doctor of Nursing Practice (DNP) degree with Boise State University. I came across and was very impressed with your work on client satisfaction, the Client Satisfaction: Case Management (CSAT-CM).

I would like to ask permission to use it as a guide and develop a modified version in my measuring satisfaction of home health nurses as relates to my project Transitional Care Medical House Call (TCMHC) program.

This work is in progress and I have attached a draft copy of my abstract.

Sincerely,

~Ron

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Ron Billano Ordon MSN FNP
Doctor of Nursing Practice student
Boise State University
cell [\(916\) 223-0150](tel:9162230150)

Appendix N

Outcomes Evaluation Table

Outcome	Outcome Instrument/Data	Analysis Goal	Analytic Technique
1. Met: By December 2016, a TCMHC workflow was developed. 2. Met: By May 2017, 80% of providers were oriented to the TCMHC workflow. 3. Met: By October 2017, feedback was incorporated into TCMHC workflow.	Instrument: Signed memorandum of Understanding. Data: Agreement regarding the pilot project. A workflow as basis for future refinements.	Information to be used in the development of a blueprint for the pilot project.	This data to determine that milestones have been accomplished towards the TCMHC pilot project implementation.
4a. Met: By May 2017, benchmark readmission rates for patients in the area was obtained. 4b. Met: By August 2017, a readmission rate was determined for the TCMHC recipients using third-party	Instrument: Third-party software, Strategic Healthcare Programs to extract data from software used by home health agency. Point-of-care tracking	Gathered data regarding unplanned 30-day hospital readmission rate for at least 75% of TCMHC recipients. Point-of-care tracking determined significant need at time of TCMHC visit and point-of-care	Descriptive statistics: count, percentages of readmissions 30 days after discharge, mean and standard deviations. Histograms were used to determine trends.

software.

5. Met: By August 2017, data points were tracked to determine point-of-care activities that were significant to the project.

6. Met: By August 2017, 75% of eligible SNF discharges who agreed to the TCMHC program, received a TCMHC visit.

10. Not met (readmission reduction was not statistically significant). By November 2017, 2% was targeted for the readmission reduction compared with benchmark in unplanned 30-day hospital readmission.

worksheet:

1. Number of days to see patients from the time of referral
2. LACE index scores from SNF/hospital discharge
3. Number of medications before the visit (SNF/hospital discharge instructions) and after visit (medication reconciliation).
3. Need for prescriptions at time of visit.
4. PCP appointments at time of visit, tracked based on Medicare guidelines (PCP visit within 7-14 days).
5. Noted comorbidities and number of comorbidities present

Data:

Readmission rate measured at 30 days after discharge from SNF.

7. Not met (response rate to the survey was 15%): By September 2017, a target of at least 50% of clinical staff whose patients were recipients of TCMHC visits participate in the modified CSAT- CM (Hsieh, 2006)

Instrument:
Modified CSAT-CM (Hsieh, 2006) survey.

Telephone survey.

Data:

Awareness, satisfaction,

activities that may have impact to the significance of the visit.

Gather data on awareness, satisfaction, importance to establish baseline information for future initiatives.

Descriptive statistics: count, percentages of responses to awareness/satisfaction/importance, mean and standard deviations.

Qualitative data on open-ended responses by patients, families, and caregivers to telephone

survey. 8. Not met (response rate was 15%): By September 2017, a target of 80% of clinical staff whose patients were recipients of TCMHC visit rate their satisfaction of TCMHC services as <i>very aware/satisfied</i> or <i>completely aware/satisfied</i> for services received on the modified CSAT-CM (Hsieh, 2006) survey. 9. Not met: (response rate was 10%): By September 2017, a target of 80% of patients, families, and caregivers who were recipients of the TCMHC visit to participate in the 30-day postvisit telephone survey on the TCMHC visit.	importance survey for home health nurses at 30 days after discharge from a SNF. Open-ended question on Post visit telephone survey for patients, families, caregivers regarding the TCMHC visit.	survey.	
11. Met: By October 2017, 100% of all visits were billed to Medicare.	Instrument: Medicare billing software. Data: Medicare reimbursement rate.	Gather data from all TCMHC recipients to determine Medicare reimbursement for TCMHC visit. The data gathered will help contribute to benchmark data.	Nominal data. Averages will be determined.

Note: TCMHC = Transitional Care Medical House Calls Program; SNF = skilled nursing facility; PCP = primary care provider.

Appendix O

Institutional Review Board Approval 187-SB17-058



Date: March 24, 2017

To: Cara Gallegos

cc: Ron Ordano

From: Social & Behavioral Institutional Review Board (SB-IRB)
c/o Office of Research Compliance (ORC)

Subject: SB-IRB Notification of Approval - Original - 187-SB17-058
Transitional Care Medical House Call Program: A Pilot Study

The Boise State University IRB has approved your protocol submission. Your protocol is in compliance with this institution's Federal Wide Assurance (#0000097) and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

Protocol Number: 187-SB17-058

Received: 3/10/2017

Review: Expedited

Expires: 3/23/2018

Approved: 3/24/2017

Category: 7

Your approved protocol is effective until 3/23/2018. To remain open, your protocol must be renewed on an annual basis and cannot be renewed beyond 3/23/2020. For the activities to continue beyond 3/23/2020, a new protocol application must be submitted.

ORC will notify you of the protocol's upcoming expiration roughly 30 days prior to 3/23/2018. You, as the PI, have the primary responsibility to ensure any forms are submitted in a timely manner for the approved activities to continue. If the protocol is not renewed before 3/23/2018, the protocol will be closed. If you wish to continue the activities after the protocol is closed, you must submit a new protocol application for SB-IRB review and approval.

You must notify the SB-IRB of any changes to your approved protocol and the committee must review and approve these changes prior to their commencement. You should also notify the committee if your activities are complete or discontinued.

Current forms are available on the ORC website at <http://goo.gl/D2FYTV>

Please direct any questions or concerns to ORC at 426-5401 or humansubjects@boisestate.edu.

Thank you and good luck with your research.

1910 University Drive Boise, Idaho 83725-1139
Phone (208) 426-5401 orc@boisestate.edu

This letter is an electronic communication from Boise State University

Appendix P

Histogram of Average Days to See Patients

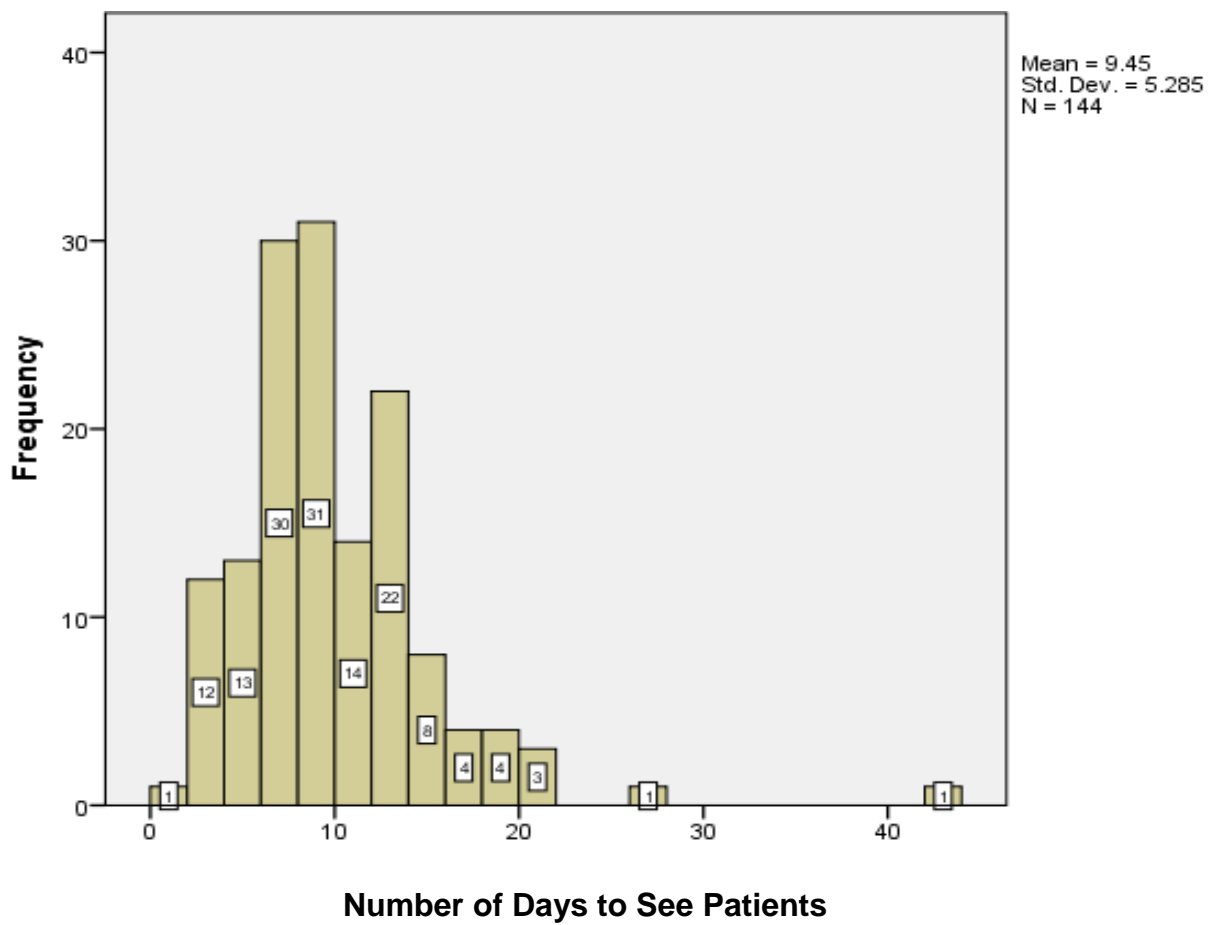


Figure 1. Histogram of average days to see patients. The mean is 9.45 days with a standard deviation of 5.285.

Appendix Q

Histogram of LACE Index Scores

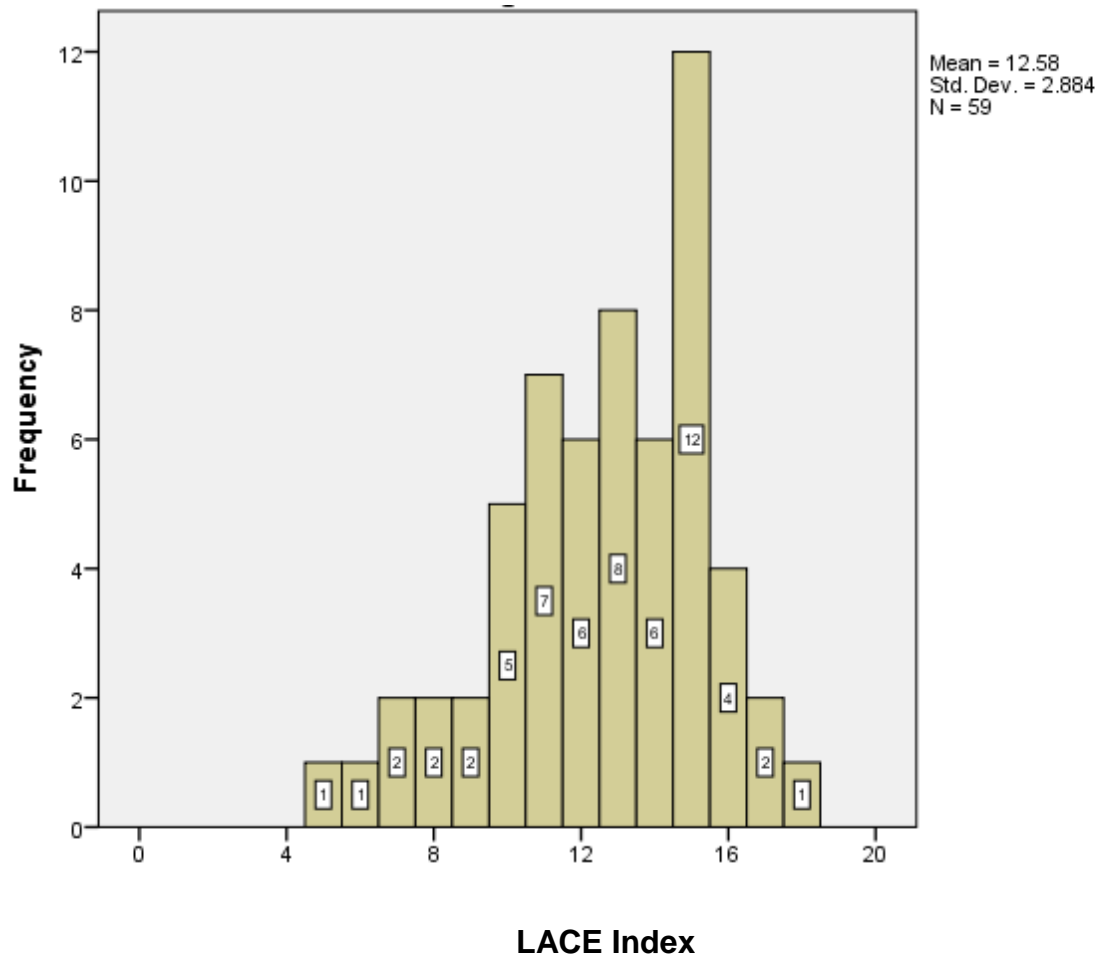


Figure 2. Histogram of LACE Index scores. The mean is 12.58 with a standard deviation of 2.884. This figure illustrates patients who are at high risk for readmission based on LACE Index scores.

Appendix R

Histogram of Polypharmacy

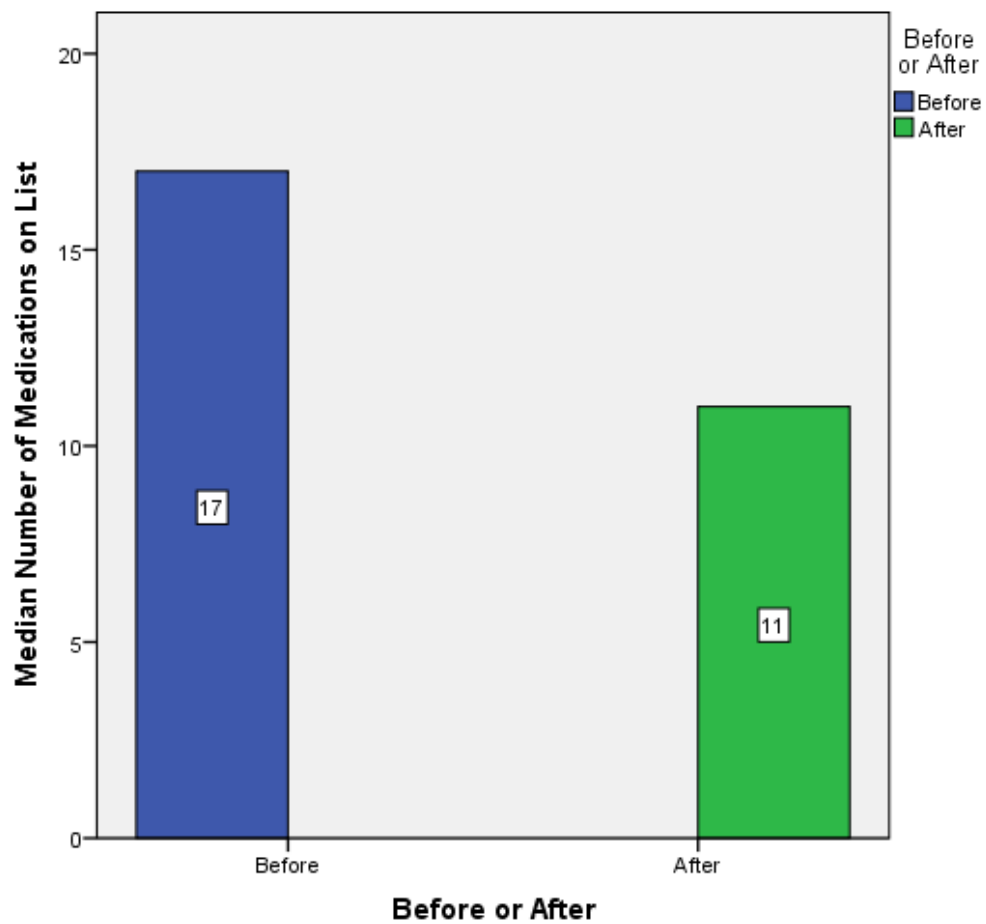


Figure 3. Histogram of polypharmacy. The medication burden was significantly reduced from 17 medications before visits to 11 medications after visits.

Appendix S

Histogram of Visits Requiring Prescriptions

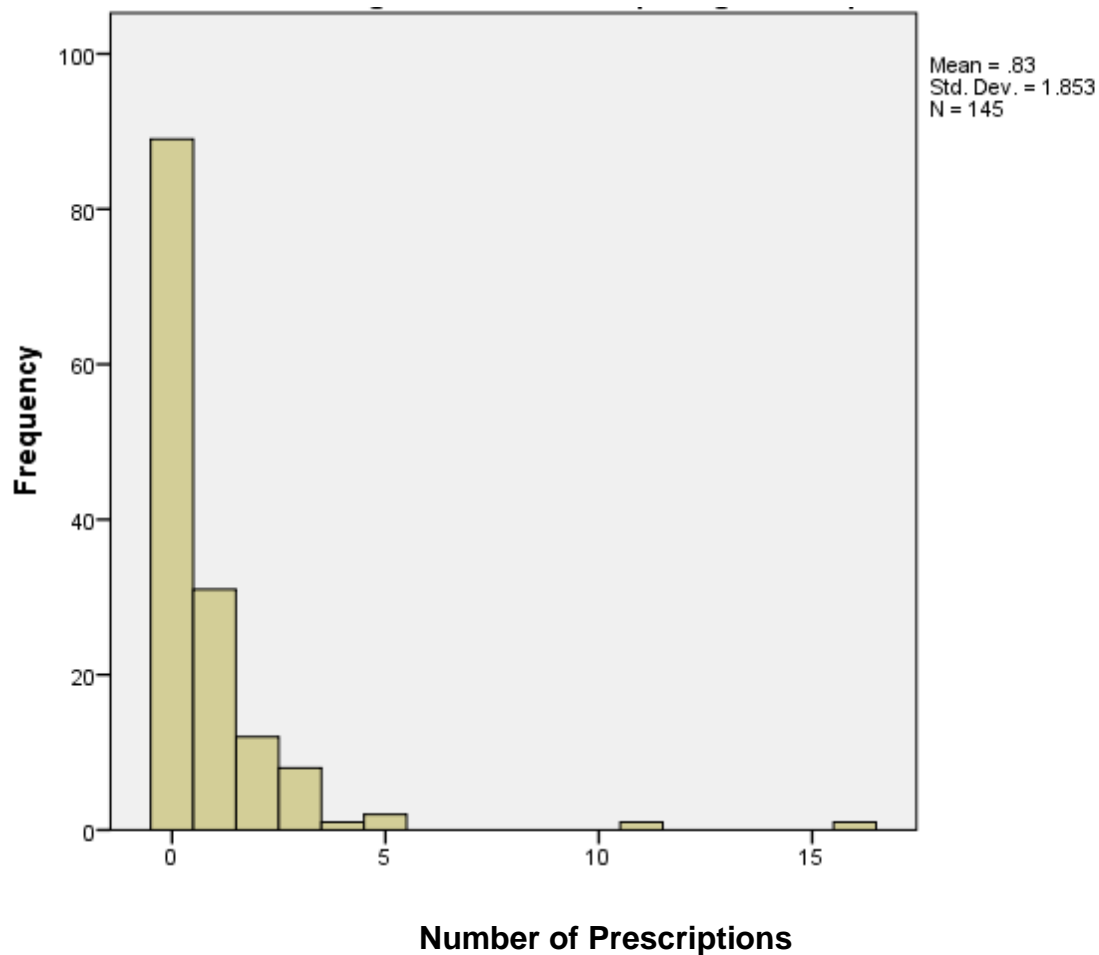


Figure 4. Histogram of visits requiring prescriptions. Most patients did not require a prescription. However, those who did require one or more is close to half of the sample.

Appendix T

Primary Care Provider Visits

		Frequency	Percent	Valid Percent	Cumulative Percent
Days to see PCP	<7d	7	4.8	4.8	4.8
	within 7d	33	22.8	22.8	27.6
	within 14d	19	13.1	13.1	40.7
	>14d	86	59.3	59.3	100.0
	Total	145	100.0	100.0	

Appendix U

Frequency of Chronic Conditions

Co-morbidities	Frequency	Percent
ESRD	6	4.1
HF	25	17.2
Dementia	13	9.0
CKD	23	15.9
COPD	31	21.4
DM	56	38.6
HTN	103	71.0

Appendix V

Histogram of Comorbidities

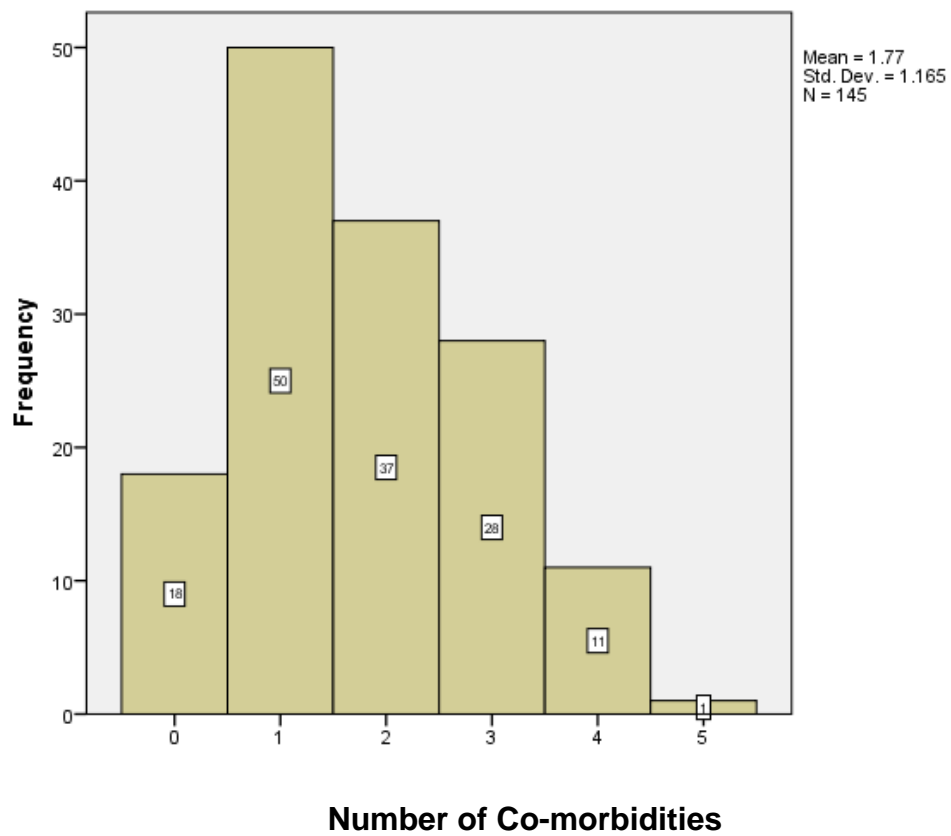


Figure 5. Histogram of number of comorbidities. A quarter ($N = 37$; 25.5%) reported having at least two comorbidities.

Appendix W

Modified CSAT-CM Survey Results

	Unaware/ Unsatisfied/ Unimportant	Barely Aware/Satisfied/ Important	Neutral or N/A	Very Aware/Satisfied/ Important	Completely Aware/Satisfied/ Important
TCM Awareness	50%			50%	
TCMHC Awareness	40%	20%		40%	
PCP Satisfaction	40%	20%			20%
TCMHC Satisfaction			80%		20%
TCM Importance			40%	20%	40%
TCMHC Importance			40%	20%	40%
PCP Response Importance			20%	20%	60%
TCMHC Response Importance			20%	20%	60%

Appendix X

Statement of Operations

Items	Projection	Actual
Staff salaries (medical assistant)	\$10,397	\$6,931
Travel and gas	\$600	\$400
Printing	\$150	\$100
TCMHC provider salary (provided in kind by DNP student)	\$48,000	\$32,000
Statistician	\$500	\$500
Copy editor	\$500	\$500
TOTAL EXPENSE	\$60,147	\$40,431
Grant funding (applied for)	\$5,000	\$0
Medicare reimbursement	\$26,100	\$26,100
TOTAL INCOME	\$31,100	\$26,100
Net revenue	(\$29,047)	(\$14,331)

Appendix Y

Preliminary Budget

EXPENSES	Pilot Year 1 (6 mos)	Year 2	Year 3	Year 4
Staff Salaries and Benefits (in kind for Year 1): Existing Medical Assistants (MA) @ \$10.83/hr x 8 hrs/day with \$1 increase/year	\$20,794	\$45,427	\$49,267	\$53,107
Staff Salaries and Benefits (Transitional Care Medical Assistant) new for practice in Year 1 @ \$10.83/hr x 8 hrs/day	\$10,397	\$22,714	\$24,634	\$26,554
25% Rent Contribution (in kind for Year 1) @ \$3,500/year and \$1,000 increase/year	\$875	\$1,125	\$1,375	\$1,375
Travel (Gas allowance for NP visits) @ \$100/month	\$600	\$1,200	\$1,200	\$1,200
Communications (phone, postage, etc.) in kind for Year 1 @ \$25/month	\$150	\$300	\$300	\$300
Printing (brochures, business cards) @ \$25/month	\$150	\$300	\$300	\$300
Printed Materials (handouts) @ \$10/month	\$60	\$120	\$120	\$120
Supplies and Equipment (Clerical and Administrative Supplies) in kind for Year 1 @ \$100/month	\$600	\$1,200	\$1,200	\$1,200
DNP Student (Year 1) or NP (Year 2 onwards) doing house calls @ \$100 per visit (in kind for Year 1 @ 20 visits/week)	\$48,000	\$192,000	\$288,000	\$384,000
Statistician @ \$1,163 per month	\$6,978	\$0	\$0	\$0
Copy Editor @ \$500 one-time contract	\$500	\$0	\$0	\$0
Electricity (contribution in kind for Year 1) @ \$25/month	\$150	\$300	\$300	\$300
Heating/air-conditioning (contribution in kind for Year 1) @ \$25/month	\$150	\$300	\$300	\$300
10% of Medicare reimbursement as fees for Collaborating MD	\$8,640	\$34,560	\$51,840	\$69,120
5% of Medicare reimbursement as fees for Medical Biller	\$4,320	\$17,280	\$25,920	\$34,560
5% of Medicare reimbursement as fees for Admin Fee (Practice Management)	\$4,320	\$17,280	\$25,920	\$34,560
Clinic hardware/equipment (faxes, printers) in kind for Year 1 (allocation)	\$0	\$0	\$1,000	\$0
Total Expense	\$106,683	\$334,106	\$471,676	\$606,996
INCOME				
Grant Funding (Optional)	\$5,000	\$0	\$0	\$0
Medicare reimbursement @ \$180 per visit (initially at Year 1, 20 visits/week x 4 weeks x 6 mos) then onwards visits per day per NP 5 days/week x 4 weeks per month (add 1 NP per year)	\$86,400	\$345,600	\$518,400	\$691,200
NET INCOME/REVENUE	-\$15,283	\$11,494	\$46,724	\$84,204

Appendix Z

5-Year Budget

Revenues	Description	Budget Year 1	Budget Year 2	Budget Year 3	Budget Year 4	Budget Year 5
PROJECTED INCOME						
Grant Applied for	Grant Funding (Optional)	\$5,000	\$0	\$0	\$0	\$0
Projected Reimbursements*	Medicare reimbursement @ \$180 per visit (Year 1 Pilot Study; Year 2 onwards add 1 NP per year Target minimum average of 20 visits all week 30 weeks per month 12 mos per year)	\$86,400	\$345,600	\$518,400	\$691,200	\$864,000
Total Income		\$91,400	\$345,600	\$518,400	\$691,200	\$864,000
Expenses: Logistics & Support Services						
Support Services Staff Salaries	Staff Salaries and Benefits (in kind for Year 1) 2 existing Medical Assistants (MA) @ \$10.83/hr. 30 hrs./day with \$1 increase/year (1 MA for every 2 NPs)	\$20,794	\$45,427	\$49,267	\$53,107	\$85,421
Logistics Office Space	25% Rent Contribution (in kind for Year 1) @ \$3,500/mo Year 2 and \$1,000 increase/year thereafter	\$5,250	\$10,500	\$10,500	\$10,500	\$10,500
Logistics Travel	Gas allowance for NPs visits @ \$100/month (in kind for Year 1)	\$600	\$2,400	\$3,600	\$4,800	\$6,000
Logistics Equipment & Supplies	Printer, cartridges, paper, supplies, office supplies, etc. (in kind for Year 1) @ \$100/month	\$600	\$1,200	\$1,200	\$1,200	\$1,200
Communications	Phone, postage, etc. (in kind for Year 1) @ \$25/month	\$150	\$300	\$300	\$300	\$300
Logistics Electricity	Electricity (contribution in kind for Year 1) @ \$25/month	\$150	\$300	\$300	\$300	\$300
Logistics Heating/Air-conditioning	Heating/air-conditioning (contribution in kind for Year 1) @ \$25/month	\$150	\$300	\$300	\$300	\$300
Logistics Equipment	Clinic hardware/equipment (faxes, printers) (in kind for Year 1) (allocation)	\$0	\$1,000	\$0	\$1,000	\$0
Total		\$27,694	\$61,427	\$65,467	\$71,507	\$104,021
Expenses: Marketing & Advertising						
Information Dissemination	Printing (handouts, brochures, business cards) @ \$25/month	\$150	\$300	\$300	\$300	\$300
Total		\$150	\$300	\$300	\$300	\$300
Expenses: Professional Services						
Medical House Call Provider	DNP student (in kind for Year 1) or NP (Year 2 onwards) providing medical house calls @ \$100 per visit (in kind for Year 1 at average 20 visits/week)	\$48,000	\$192,000	\$288,000	\$384,000	\$480,000
Statistician	Statistician @ \$500 one-time contract	\$500	\$0	\$0	\$0	\$0
Editor	Copy editor @ \$500 one-time contract	\$500	\$0	\$0	\$0	\$0
Collaborating Physician	15% of Medicare reimbursement as fees for Collaborating MD (Estimated)	\$13,710	\$51,840	\$77,760	\$103,680	\$129,600
Medical Biller	4.5% of Medicare reimbursement as fees for Medical Biller (Estimated)	\$4,113	\$15,552	\$23,328	\$31,104	\$38,880
Administration Fee (Practice Income)	5% of Medicare reimbursement as fees for Admin Fee (Practice Management) (Estimated)	\$4,570	\$17,280	\$25,920	\$34,560	\$43,200
Total		\$71,393	\$276,672	\$415,008	\$553,344	\$691,680
Total Expense		\$99,237	\$338,399	\$480,775	\$625,151	\$796,001
Revenue		(\$7,837)	\$7,201	\$37,625	\$66,049	\$67,999
Net Practice Income		(\$3,267)	\$24,481	\$63,545	\$100,609	\$111,199