5-8-2017

Return on Investment Comparison of Three Payment Models for Chronic Care Management Under Medicare in a Northwestern Physician Hospital Organization

Megan J. Madole
Grand Valley State University, heslingm@mail.gvsu.edu

Follow this and additional works at: http://scholarworks.gvsu.edu/kcon_doctoralprojects

Part of the Nursing Commons

Recommended Citation
http://scholarworks.gvsu.edu/kcon_doctoralprojects/20

This Project is brought to you for free and open access by the Kirkhof College of Nursing at ScholarWorks@GVSU. It has been accepted for inclusion in Doctoral Projects by an authorized administrator of ScholarWorks@GVSU. For more information, please contact scholarworks@gvsu.edu.
Return on Investment Comparison of Three Payment Models for Chronic Care Management

Under Medicare in a Northwestern Physician Hospital Organization

Megan Jean Madole

Kirkhof College of Nursing

Grand Valley State University

Advisor: Cynthia Coviak, PhD, MSN, RN

Project Team Members: Susan Harrington, PhD, RN and Beth Oberhaus, MBA, BSN, RN, PMP

Date of Submission: May 7, 2017
Dedication

I dedicate this work to my family and friends who have supported me throughout this journey. This would not have been possible without the support of my husband; for his love, patience, and faith in me and my abilities as a scholar. I could not imagine a better partner in life. There have been many people who have walked alongside me during the past four years. Thank you to Jennifer and Jodi for constant hours of edits, advice, and support. I am truly blessed our lives crossed paths. To my friends for life, Erin and Jenna, I am sincerely grateful for your friendships. To Erin and Josh, who opened up their home to me, offered me a place to stay, and Friday morning coffee. To my son Connor, for listening to me read articles to you all day. To my father for instilling in me the importance of higher education and perseverance. Finally, I would like to dedicate this to my mother, Donna. I would not be the woman I am today without your compassion, guidance, and love. I am sure you are laughing in heaven about my constant protests that I would never be a nurse like you.
Acknowledgements

I would like to extend many thanks to:

My Project Advisory Committee for their guidance, support, and patience.

To Beth Oberhaus for imparting all your wisdom surrounding the complexities of healthcare, for your patience with my inexperienced self, and your straight to the point leadership qualities.

To the organization, the PHO team, and the exemplar practice case manager for your support.
## Table of Contents

Dedication ......................................................................................................................... 3

Acknowledgments .............................................................................................................. 4

Table of Contents ............................................................................................................... 5

Abstract ............................................................................................................................... 7

Executive Summary ............................................................................................................ 9

Introduction and Background ............................................................................................ 12

Problem Statement ............................................................................................................ 13

Evidence-Based Initiative ................................................................................................. 15

Conceptual Models ............................................................................................................ 23

Implementation Model ....................................................................................................... 27

Need and Feasibility Assessment of Organization ............................................................. 31

Payment Models ................................................................................................................ 33

Project Plan .......................................................................................................................... 41

  a. Purpose of Project ......................................................................................................... 41

  b. Type of Project ............................................................................................................. 42

  c. Setting and Resources ................................................................................................. 42

  d. Design for the Evidence-based Initiative .................................................................... 42

  e. Measurement: Sources of Data ................................................................................ 44

  f. Steps for Implementation of Project ........................................................................ 45

  g. Project Evaluation ...................................................................................................... 46

  h. Budget ......................................................................................................................... 46

  i. Ethics and Human Subjects Protection .................................................................... 47
Project Outcomes ........................................................................................................... 47
Stakeholder Support ....................................................................................................... 65
Implications for Practice ................................................................................................. 66
   a. Project Strengths/Success/Weaknesses/Difficulties .............................................. 67
   b. Implications for Organization ............................................................................... 68
   c. Implications for the Community ........................................................................... 70
   d. Recommendations for Sustainability .................................................................. 71
Relation to Other Evidence and Healthcare Trends .................................................... 71
Limitations ...................................................................................................................... 73
Reflection on Enactment of DNP Essential Competencies .......................................... 75
Dissemination of Outcomes ............................................................................................ 79
Conclusion ..................................................................................................................... 79
References ..................................................................................................................... 82
Appendices ..................................................................................................................... 94
   a. A Casual Model of Organizational Performance and Change ............................... 94
   b. Wagner’s Chronic Care Model .............................................................................. 96
   c. SWOT of CCM Program ...................................................................................... 99
   d. CPC+ Track one Reconciled Payment Methodology ........................................... 100
   e. CPC+ Electronic Clinical Quality Metric Requirements .................................... 101
   f. Human Research Review Committee Determination ........................................ 102
   g. Implementation Timeline .................................................................................... 103
   h. Revenue based on Case Manager Productivity in CPT Billing ........................... 104
   i. Microsoft Excel ROI Template ............................................................................ 105
Abstract

Chronic disease is the most prevalent and costly health condition. The coordination of care provided to those with multiple chronic conditions (MCCs) is suboptimal and fragmented. This population is among the highest utilizers of healthcare, and accounts for the majority of Medicare expenditures annually. Chronic care management (CCM) programs represent evidence-based initiatives shown to improve outcomes, reduce hospital and emergency department utilization, and reduce healthcare costs. Centers for Medicare and Medicaid Services (CMS) have provided various payment models for reimbursement of CCM services. Primary care practices have stated that inadequate reimbursement and confusing payment models are barriers to CCM implementation.

This project was a return-on-investment (ROI) comparison of three different payment models for CCM services under Medicare for a northwest Michigan physician hospital organization. The Agency for Healthcare Research and Quality (AHRQ) ROI toolkit served as the implementation framework for the project. An estimation of the cost of the ongoing operation of the CCM program and projected revenue for 2017 was conducted. The results of the ROI analysis demonstrated a ROI of $1.39 for CPC+ track one practice participating in the comprehensive primary care plus (CPC+) initiative; $1.55 as a practice participating in CPC+ as a member of an accountable care organization having met the minimum savings rate, $1.34 if the minimum savings rate was not met; and $0.44 as a practice utilizing current procedural terminology billing for every dollar spent. This analysis provides the necessary knowledge on the cost-effectiveness of CCM management and reimbursement models under CMS at the practice level. This report discusses the background of MCCs, CCM, and the implementation, evaluation, outcomes, and limitations of the ROI analysis.
Keywords: Chronic disease, multiple chronic conditions, care management, return on investment,

Agency for Healthcare Research and Quality
Executive Summary

Chronic diseases are the most prevalent and costly health conditions in the United States (Centers for Disease Control and Prevention [CDC], 2016). The term multiple chronic conditions (MCCs) is defined as “two or more concurrent chronic diseases” (Skinner, Coffey, Jones, Heslin, & Moy, 2016, p. 1). The prevalence of those with MCCs is increasing (Skinner et al., 2016). In 2012, 63 million individuals, 65 years and older, had more than one chronic disease (CDC, 2016). This number has been projected to reach 81 million by 2020 as the population continues to age (Vogeli et al., 2007). This trend will result in a growing body of Medicare fee-for-service beneficiaries who will need interventions to coordinate their care, improve their disease management, and decrease healthcare costs.

Having MCCs complicates a person’s ambulatory care, which results in care that is fragmented, uncoordinated, and inefficient (Boult et al., 2008; Skinner et al., 2016). Therefore, those with MCCs have often utilized acute care services driving up healthcare costs. Those living with MCCs are 3.5 times more likely to be hospitalized annually and have accounted for 98% of Medicare readmissions each year. Having MCCs is also a risk factor for emergency department (ED) utilization. Of individuals with two or more conditions, 25% of them had visited the ED in the last year (CMS, 2012). This increased to 41% for those with four to five conditions, and 70% for those with six or more (CMS, 2012). MCCs account for 86% of the annual healthcare expenditure (CDC, 2016). The average Medicare spending per beneficiary was $9,738 in 2010 (CMS, 2012). Also in year 2010, Medicare beneficiaries with four to five chronic conditions represented $12,174 per capita in Medicare spending (CMS, 2012). Those with six or more accounted for $32,658 per capita in Medicare spending annually.
Hospitalizations for this population alone represented 55% of the total Medicare spending in 2010 (CMS, 2012).

Nurse-led chronic care management (CCM) programs are evidence-based quality improvement programs that improve care coordination for those living with MCCs in the community. Literature confirms that CCM programs reduce hospitalizations, demonstrate a trend toward reduced ED utilizations, and increase patient satisfaction. Cost analyses demonstrated significant savings to Medicare and a positive return-on-investment (ROI) from a Medicare perspective. However, the literature assessing the ROI for CCM programs at the practice level is minimal. There is also a lack of literature comparing various reimbursement mechanisms surrounding CCM. The sustainability of CCM programs is essential to providing quality and cost-effective care to this population.

The purpose of this project was to conduct a ROI analysis for three payment models under Medicare for CCM services for a northwestern physician hospital organization. The three payment models included: (a) a practice as a member of the comprehensive primary care plus (CPC+) initiative but not a member of an accountable care organization (ACO); (b) a practice as CPC+ and a member of an ACO; and (c) utilization of current procedural terminology fee-for-service billing, only. The objectives were to: (a) conduct the ROI analysis for the three payment models; and (b) interpret the results for the organization. The Agency of Healthcare Research and Quality’s ROI toolkit was utilized as the implementation model for the project.

The results of the projected ROI analysis for 2017 within each payment model are provided below. The largest ROI for CCM services is provided by the model of CPC+ as a member of an ACO that met the minimum savings rate (MSR) to participate in shared savings incentives; followed by the model of CPC+ but not a member of an ACO; then by the model of
CPC+ as a member of an ACO having not met the MSR; and the least amount of return coming from CPT billing, only. As a practice with CPC+ being a member of an ACO that met the MSR, the ROI would result in a return of $1.55 for every dollar the practice invested in the program. If the ACO did not meet the MSR, the return would be $1.34. The ROI for a CPC+ not associated with an ACO would result in $1.39 for every dollar invested. The ROI for CPT billing alone was $0.44 for every dollar invested in the CCM program.

This analysis provided the organization with the tools to evaluate the payment model that would deliver the largest ROI for CCM services at the practice level. There are limitations to the analysis. The ROI predictions are not generalizable to federally qualified health centers or rural health centers, which follow a separate payment model. The analysis was intended for the organization and thus has limited generalizability to other settings. However, the completed analysis adds to the growing knowledge surrounding CCM and provides a necessary analysis of the ROI at the practice level.
Introduction and Background

Chronic diseases are the most prevalent and costly health conditions in the United States (Centers for Disease Control and Prevention [CDC], 2016). They are the leading cause of illness, disability, and death in the U.S. (Hickman et al., 2013). Chronic diseases are of slow progression and last longer than three months (National Health Council, 2014). The term multiple chronic conditions (MCCs) is defined as “two or more concurrent chronic diseases” (Skinner, Coffey, Jones, Heslin, & Moy, 2016, p. 1). The prevalence of those with MCCs is increasing (Skinner et al., 2016). In 2012, 63 million individuals 65 years and older had more than one chronic disease (CDC, 2016). This number is projected to reach 81 million by 2020 as the population continues to age (Vogeli et al., 2007).

The prevalence of chronic disease increases with age. By age 65, 63% of people have two or more chronic diseases; this increases to 83% for those 85 years and older (Centers for Medicare and Medicaid Services [CMS], 2012). According to the Centers for Medicare and Medicaid Services (CMS), over 32% of Medicare beneficiaries had at least two chronic conditions, 23% had four to five conditions, and over 14% had six or more chronic conditions in 2010 (CMS, 2012). Care for this population is complicated by the interactions and complexity of a high number of morbidities (Skinner et al., 2016). Having MCCs complicates ambulatory care which results in care that is fragmented, uncoordinated, and inefficient (Boult et al., 2008; Skinner et al., 2016). Those with MCCs often utilize acute care services, driving up healthcare costs. As a result, MCCs in 2016 accounted for 86% of the nation’s annual healthcare expenditure (CDC, 2016).
Problem Statement

The current healthcare system is structured and financed to manage acute health problems rather than extensive chronic disease (Urato, McCall, Cromwell, Lenfestey, & Raeder, 2013). It has been estimated that those with MCCs can see an upwards of 14 providers (Vogeli et al., 2007). This can often result in conflicting advice from multiple providers and added complexity when reconciling instructions, medications, and treatments (Urato et al., 2013; Vogeli et al., 2007). Care for this population needs to be coordinated rather than delivered in discrete, siloed settings (Urato et al., 2013). Due to the fragmented and uncoordinated care that they receive, those with MCCs are high utilizers of acute care services (Taylor et al., 2015).

Individuals with MCCs are the heaviest utilizers of acute healthcare services (Skinner et al., 2016). The annual percentage of hospital stays for those with MCCs is 3.5 times higher than for those without MCCs (Steiner, Barrett, Weiss, & Andrews, 2014). Of the 14% of Medicare beneficiaries with six or more chronic conditions, over 60% were hospitalized in 2010 (CMS, 2012). Individuals with MCCs have had higher readmission rates and have accounted for almost all annual Medicare readmissions (CMS, 2012). In 2010, 1.9 million Medicare beneficiaries experienced a readmission, and MCCs accounted for 98% of them (CMS, 2012). The presence of MCCs results in longer hospital stays and higher inpatient costs per day (Skinner et al., 2016). Hospital stays cost on average 20% more for adults with MCCs than for those without, averaging approximately $2,000 more per stay (Steiner et al., 2014).

The Agency for Healthcare Research and Quality (AHRQ) evaluates ambulatory care sensitive (ACS) conditions and the occurrence of potentially preventable hospitalizations (Skinner et al., 2016). Since effective and timely outpatient care can potential prevent hospitalizations, chronic conditions are considered ACS conditions (Lui & Wallace, 2011). Of
patients hospitalized for preventable ACS conditions in 2012, 80% of them had MCCs (Skinner et al., 2016). Hospitalization costs for ACS conditions were 19% higher for those with two or three conditions, and 32% higher for those with four or five conditions compared to those without MCCs (Skinner et al., 2016).

Having MCCs is also a risk factor for emergency department (ED) utilization. In 2010, 25% of individuals living with MCCs visited the ED that year (CMS, 2012). This increased to 41% for those with four to five conditions, and 70% for those with six or more (CMS, 2012). The high utilization of ED visits translates into increased Medicare spending (Lochner & Cox, 2010). ED charges for ASC conditions are 320-728% higher than a primary care clinic visit (Galarraga, Mutter, & Pines, 2015). It has been estimated that 13-27% of ED visits could be managed by primary care and the result would be a savings of $4.4 billion annually (Enard & Ganelin, 2013).

In 2016, MCCs accounted for 86% of the annual healthcare expenditure (CDC, 2016). In 2010, the average Medicare spending per beneficiary was $9,738 (CMS, 2012). Medicare beneficiaries with four to five chronic conditions cost $12,174 per capita in Medicare spending and those with six or more represent $32,658 per capita in Medicare spending in 2010. Hospitalizations for this population alone accounted for 55% of the total Medicare spending in 2010 (CMS, 2012). MCCs place significant burden on the healthcare system, which continues to increase with each preventable hospital admission and ED visit (Skinner et al., 2016).

MCCs add to the complexity of healthcare needs and management of those suffering from them. The discussion regarding how to manage this population and reduce healthcare costs has focused on improving healthcare delivery by enhancing primary care (Galarraga et al., 2015). Subsequently, initiatives have been put in place to evaluate the role of MCCs on quality and cost,
and inform policy to improve care (Skinner et al., 2016). These initiatives evaluated the implementation of evidence-based interventions to improve ambulatory care coordination. The Medicare Coordinated Care Demonstration and Care Management for High Cost Beneficiaries (CMHCB) assessed the impact of nurse-led chronic care management (CCM) services on the coordination of care for those living with MCCs and healthcare expenditures. These programs demonstrated a significant improvement in health outcomes and reductions in healthcare spending. However, there is limited information on the cost of developing and maintaining a CCM program at the practice level.

Cost evaluations within the literature focused on the return-on-investment (ROI) for Medicare. CCM has been found to significantly reduce Medicare spending and provide a positive ROI for Medicare. However, at the practice level, if the program does not maintain cost neutrality or result in appreciable revenue, the program is a challenge to sustain (Holtrop, Luo, & Alexanders, 2015). This presents a key barrier to development of CCM programs at the practice level (Holtrop et al., 2015). This report describes a return-on-investment (ROI) comparison for CCM services, delivered to Medicare beneficiaries living with MCCs, utilizing three different payment models for a physician hospital organization (PHO) in northwestern lower Michigan.

**Evidence-Based Initiative: Chronic Care Management**

CCM provides coordination of care within the ambulatory setting for those with MCCs living in the community. CCM is “a set of activities designed to assist patients and their support systems in managing medical conditions and related psychosocial problems more effectively, with the aim of improving patients’ health status and reducing the need for medical services” (McCarthy, Ryan, & Klein, 2015, p. 2). Nurses serving in case management roles are able to assess the patient’s functional and historical backgrounds and environmental well-being (Joo,
Case managers deliver services mostly by telephone contact with occasional face-to-face contact either in the home or clinic setting. Case managers develop an evidence-based and patient-centered care plan which is regularly updated as patient needs change. The care plan also provides feedback to the multidisciplinary care team on the patient’s status. The goal of CCM is to assist the patient and family in decision making, promote empowerment through self-care, provide medication reconciliation, link patient needs to community resources, and facilitate coordination of care among providers and during transitions of care (Joo, 2014).

**Characteristics of CCM Programs**

**Embedded Nurse-Led**

Successful CCM programs often incorporate a nurse-led case management approach where nurses work alongside the primary care team (Young & Clegg, 2010). The Case Management Society of America (CMSA) recommends that case managers hold an active certificate in case management or have a bachelor’s degree in a health or human services profession (CMSA, 2010). Successful programs assign all of the provider’s patients to the same case manager (Brown, Peikes, Peterson, Schore, & Razafindrakoto, 2012). Programs feature an embedded structure, where the case manager is located in the provider building (Brown et al., 2012). This allows for easy communication with providers and access to patients for face-to-face contact (Brown et al., 2012).

**Patient Panel**

The case management panel, or caseload, varies depending on the size of the program and the intensity of interventions (AHRQa, 2014). For example, a caseload might be as high as 500 patients, or as low as 25 patients, depending on the complexity of the patients and the interventions needed (AHRQa, 2014). On average, 31.1% of case managers had a caseload of 1
to 49 clients per month, and 42.2% had a caseload of 50 to 99 patients (Stricker, 2014). Many successful CCM programs had a panel of around 40-70 patients (Boyd et al., 2009; Peikes, Chen, Schore, & Brown, 2009).

**Patient Contact**

Case management can be conducted either by telephone or face-to-face patient contact. Telephone contacts are used to regularly monitor patient status, give appointment reminders, and deliver education and counseling (AHRQ, 2014a). Face-to-face contact occurs at the initial case management visit, in which the case manager conducts a thorough assessment of the patient and the patient’s needs. Face-to-face contacts also occur as regular visits before or after appointments with the primary provider (AHRQ, 2014a). This system allows for more face-to-face contact with the patient, and interdisciplinary collaboration with the patient’s care team (AHRQ, 2014a). Four CCM programs that successfully reduced the number of hospitalizations all featured programs with a minimum of one face-to-face visit per month (Brown et al., 2012).

**Targeting Patients**

The most essential element of a CCM program is having an understanding of the population it will impact (AHRQ, 2014b). Most programs are targeted at a subpopulation of patients with MCCs who are at risk of disease exacerbation and deterioration. Different case management models incorporate different levels of coordination based on patient risk.

The Kaiser Model provides services to individuals in all stages. Those with chronic disease at low risk for hospitalization receive supportive care; those with moderate risk receive education on self-management of their disease; and those who are at highest risk receive case management services (National Health Service, 2006). Patients are identified as eligible for CCM services based on a set of criteria or risk stratification tools. For example, eligibility
criteria from the Kaiser Permanente Geriatric Case Management Program includes individuals over 65 years of age with chronic disease who meet one of the four additional criteria: three or more emergency department visits or hospitalizations in the past 12 months; two or more medical office visits in the past three months; one or more deficiencies in activities of daily living; or cognitive impairment (Drennan & Goodman, 2004). The EverCare model and the Pfizer approach focus on providing services only to those at the highest risk for hospitalization and morbidity. The goal of this approach is to reduce costs by decreasing hospital admissions (Young & Chen, 2010).

These models have been successful at reducing hospitalizations and healthcare spending by focusing care management resources to those at highest risk for disease exacerbation and hospitalization (National Health Services, 2006). Therefore, programs may choose to target this subpopulation because it is more impactful (AHRQ, 2014b). Targeting members for whom services will be most impactful allows for efficient utilization of resources (AHRQ, 2014b). When looking at making an impact to ensure sustainability, the next year’s high cost individuals will come from all three risk stratified groups (low, medium, and high complex) (Whittington & Cline, 2013).

One method from Care Oregon analyzed high utilizers of services and their average cost over 12 months. They found that those with two or more inpatient admissions and six or more ED visits constituted only 3% of their population but 32% of healthcare costs (as cited in Whittington & Cline, 2013). In contrast, those with one inpatient admission and less than five ED visits constituted 4% of the population, but only 14% of the total healthcare costs over 12 months (as cited in Wittington & Cline, 2013). Their model proposed targeting those with more inpatient visits would be the most impactful at reducing overall healthcare spending. The
programs most successful at reducing hospitalization rates were those that targeted this subpopulation of high utilizers (Brown et al., 2012).

**Evidence-based Outcomes**

**Hospital Utilization**

A majority of available research studies demonstrate that CCM services reduce hospitalizations (Chow & Wong, 2014; Dorr, Wilcox, Brunker, Burdon, & Donnelly, 2008; Hamar et al., 2010; Hamar et al., 2011; Joo, 2014; Schraeder et al., 2008). Hamar et al. (2010) demonstrated a decrease in hospitalizations by 6% for those in a CCM program, compared to a 18.9% increase in hospitalizations in the comparison group (p = .0002). The decreased rate of admissions was more significant for those who were identified as high risk healthcare utilizers at baseline (Hamar et al., 2010). Schraeder et al. (2008) found CCM significantly reduced total hospitalizations and decreased the likelihood of being hospitalized multiple times by 34% (p = .032).

Chow and Wong (2014) compared CCM involving telephone contacts only and CCM involving telephone and face-to-face contact. Both programs demonstrated a trend toward lower hospitalizations after just four weeks of services. The reduction in hospitalizations reached statistical significance at 12 weeks for both programs (p = .018) (Chow & Wong, 2014). Of the 15 programs in the original CMS demonstration, Mercy Medical Center’s program demonstrated a statistically significant effect at decreasing hospitalizations by 17%. Massachusetts General Care Management program also demonstrated a trend toward a reduction in all cause admissions, but the reduced percentage failed to reach statistical significance (Kodner, 2015).
Emergency Department Utilization

The overall effect of CCM at reducing ED utilization is inconclusive. A synthesis of the literature revealed that only Massachusetts General Care Management program was successful at reducing ED visits over a three-year period (Kodner, 2015). Joo (2014) revealed a trend toward a reduction in ED visits, but it was not statistically significant. In the study conducted by Schraeder et al. (2008), both CCM programs had the same percentage of ED visits as the comparison group.

Patient Satisfaction

CCM services have been found to improve patients’ self-reported quality of life, their ratings of confidence in nursing roles, and their overall satisfaction with care (Lupari, Coates, Adamson, & Crealey, 2011). In a study conducted by Boyd and colleagues (2009), those receiving CCM services reported statistically significant increased quality of care scores. They were also two times more likely to rate their care as highly satisfactory ($p = .003$). This held true for both low and high utilizers of acute healthcare services (Boyd et al., 2009). The CCM participants also had a significantly greater odds of rating the coordination of their care as “high” ($p = .016$). Boult et al. (2008) also demonstrated that those receiving CCM were twice as likely to rate their care “high quality” ($p = .006$). Massachusetts General also reported an increase in patient satisfaction and trust in their healthcare team for those enrolled in CCM services (Kodner, 2015).

Cost Analyses

One of the goals of CCM programs is to reduce acute care utilization and reduce overall healthcare spending. The majority of cost analyses reported within the literature are from the perspective of Medicare savings. Schraeder et al. (2008) calculated CCM services costing $54
per member per month (PMPM). The program demonstrated $106 PMPM in Medicare savings (demonstrated by reduction in hospitalizations and fewer hospital days), but the reduction did not reach statistical significance.

Massachusetts General Care Management Program also reported a 7% net savings (Kodner, 2015). Their intervention targeted high cost Medicare beneficiaries. Their CCM program consisted of embedded nurse case managers who provided telephone and face-to-face contact. Each case manager had a caseload of 200-250 beneficiaries. As part of CMS’s CMHCB demonstration, Massachusetts General negotiated a payment of $123 PMPM, which increased to $129 by the third year of the demonstration (Urato et al., 2013). In the three years of the demonstration, the program saved Medicare $2.60 for every dollar spent (Urato et al., 2013).

The Robert Bosch Healthcare System, Inc.’s Health Buddy ® Program was also part of the CMHCB demonstration. This program utilized a health information technology software called Health Buddy ®, which asked beneficiaries a series of questions each day surrounding disease management. The results were then communicated to the nurse case manager daily. The Health Buddy ® Program negotiated a $120 PMPM fee, which increased to $127.80 PMPM by year three of the demonstration (McCall, Cromwell, Smith & Urato, 2011). The estimated cost of the intervention was $78 PMPM (McCall et al., 2011). The CCM program resulted in gross savings of 8.1%, which did not reach statistical significance (a savings of 12.1% was needed to be significant with 95% confidence) (McCall et al., 2011). The financial savings were approximately two dollars for every dollar spent (McCall et al., 2011).

The Missouri Department of Social Services conducted a ROI for CCM services to those with MCCs, who were dual eligible for Medicare and Medicaid. The CCM program consisted of
nurse case managers with a panel maximum of 250 patients. They received a care management payment of $58.87 PMPM to cover the cost of the staff responsible for delivering CCM services (Missouri Department of Social Services, 2012). Within the first year of the program, there was a reduction in hospital admissions by 14%, ED visits by 34%, and a decrease in hospital days by 38%. This resulted in a $98 PMPM cost savings (Missouri Department of Social Services, 2012). The ROI for this 12-month period was 2.1 (Missouri Department of Social Services, 2012).

CCM demonstrated substantial savings in Medicare costs. However, there is a panoply of literature concerned with practice-level savings. Nevertheless, a recent study addressed this issue. Holtrop, Luo, and Alexanders (2015) evaluated the impact of direct reimbursement of a CCM program within a primary care physician organization in southeast Michigan. Five of the ten practices in the organization were assigned the task of developing a CCM program. Medicare provided 24% of the payer mix for the organization (Holtrop et al., 2015). Two types of reimbursement opportunities were provided: direct reimbursement for billable CCM services, and organizational reimbursement from achieving quality benchmarks (Holtrop et al., 2015).

Over a 16-month period, direct reimbursement was insufficient to cover care management costs. Only 21% of the cost of the intervention was covered by reimbursement of billable services (Holtrop et al., 2015). The organization did receive incentive payments for achieving benchmarks; however, the organization did not allocate those funds towards care management services, instead using the funds for supporting IT development (Holtrop et al., 2015).

Various initiatives from payers are exploring different payment models for CCM (Holtrop et al., 2015). CMS recognizes the ability of CCM to improve health for those living
with MCCs. It has expanded demonstration initiatives and reimbursement under the Medicare physician fee-for-service (FFS) schedule.

This scholarly project compared a cost analysis of three different payment models for CCM services and evaluated the ROI within these models for a northwestern lower Michigan PHO. In order to conduct such an analysis, the Donabedian Model and the Causal Model of Organizational Performance and Change was utilized to assess and evaluate aspects of the CCM program. The ROI analysis utilized the Agency for Healthcare Research and Quality’s ROI toolkit as the implementation model that guided the project methodology.

**Conceptual Models**

Conceptual frameworks “offer strategies for meaningful and systematic application of quality improvement methods” (Abraham, 2013, p. 38). Quality improvement requires continuous reflective practice to ensure efficacy of interventions (Abraham, 2013). Frameworks are essential to provide guidance in evaluating quality (Abraham, 2013). A key aspect to quality improvement includes a cost benefit analysis of the intervention. This allows the ability to answer if the quality improvement initiative is providing quality care while being cost-effective. The Donabedian model (1988) is a framework often utilized for defining key concepts within quality improvement and was utilized for the project.

Donabedian first published his quality improvement model in 1963, and it remains the most cited model in public health articles (Ayanian & Markel, 2016). The first element to addressing quality of care is to define what one is considering quality. How quality is defined will determine the measures and the data needed to assess it (Donabedian, 1988). Donabedian states that quality can be further classified into structure, process, and outcome (Donabedian, 1988).
Structure involves the setting in which the care occurs (Donabedian, 1988). This includes everything from allocation of human resources, materials and equipment, to money and methods of reimbursement (Donabedian, 1988). Process involves “what is done in giving and receiving care” (Donabedian, 1988, p. 1745). Process includes how patients access care, and how that care is delivered. Outcomes address the effectiveness of the care at improving the health status of the patients (Donabedian, 1988). The propositions of this model suggest that a good structure improves processes, which improves outcomes (Donabedian, 1988). For this project, the information regarding the structure, process, and outcomes of the CCM program at the PHO was gathered from a thorough organizational assessment utilizing the Burke and Litwin causal model of organizational performance and change (Burke & Litwin, 1992) (see Appendix A).

The causal model of organizational performance and change was developed in 1992 by Burke and Litwin to examine an organization’s readiness for change, and its performance. The model has roots in both implementation theory and change process theory (Burke & Litwin 1992). The purpose of the model is to “serve as a guide for both organizational diagnosis and planned organizational change” (Burke & Litwin, 1992, p. 525). The model helps to describe what drives organizational performance and how to implement change (Michela & Burke, 2000). With the organization, there are inherit linkages and relationships among variables that influence each other (Burke & Litwin, 1992). The model depicts twelve variables in total. Each of these variables can change, and interact to affect one another (Burke & Litwin, 1992). By assessing these variables and their associated linkages, one can begin to describe or predict organizational change.
The structure of an organization is the arrangement and functions of people into specific areas of responsibility (Burke & Litwin, 1992). There are 24 case managers employed by the PHO that work in their particular assigned physician practice. Human resource allocation is provided based on an as-needed basis. The Michigan Primary Care Transformation Project (MiPCT) demonstration laid out the requirement of 1 case manager per 150 complex patients; of which 30 to 50 patients are actively followed (Michigan Care Management Resource Center, 2016). The structure of the CCM program within the PHO is an embedded case management structure. This structure is different from other structures where the provider’s office employs its own case manager. Instead, the case manager works with the provider care team, but reports to the PHO in regards to roles, responsibilities, and productivity. Reimbursement for CCM services is provided by Medicare, Medicaid, and third party payers. Prior to 2017, Medicare provided 48% of the reimbursement to the program. The changes in Medicare reimbursement provided a driving factor to organizational change.

Structure also includes how key decisions surrounding the program are made. Decisions are often dictated by requirements put forth from the various initiatives and programs in which the PHO takes part. Based on these requirements, decisions regarding practice concerns to meet those requirements come from top management down to the case managers. As suggested by Donabedian’s model, reimbursement for CCM services can be viewed as an element of structure, and it can be provided in various forms, depending on participation in Medicare initiatives. This scholarly project assessed three different reimbursement or payment models from which the practices within the PHO could be reimbursed: (a) part of the comprehensive primary care plus (CPC+) initiative and not an accountable care organization (ACO); (b) CPC+ and a member of
an ACO; or (c) utilizing current procedural terminology (CPT) codes from the Medicare physician FFS schedule. The details of these three models are discussed in detail below.

The process of delivering CCM services was outlined via standards of care and policies for case management during the MiPCT demonstration. These standards included productivity goals of ten patient contacts per day, and a minimum patient caseload of 50 to 100 patients. Patients receiving CCM services were identified by risk stratification from patient registries and/or by referral from the primary care providers. Patients were then able to access their case manager during normal business hours. Services were primarily provided via telephone contact and face-to-face contact before or after the provider visit. This streamlined communication among the care team members.

The care delivered by case managers followed closely with principles of Wagner's chronic care model (see Appendix B). The model emphasizes six elements to optimizing care for chronic disease. The CCM program focused its interventions based on this model, and services were required to have the following six dimensions: leadership that emphasized chronic illness care as a priority; linkages or a referral system to community resources; self-management support; decision support tools based on evidence-based guidelines; a team-based approach that provided continuity between primary care providers and specialty services; and a clinical information system that provided population-level information and feedback on provider performance (Schmittdien, Shortell, Rundall, Bodenheimer, & Selby, 2006).

The outcomes of the CCM program aligned with the PHO’s mission and strategy. The goal of the CCM program was to improve the management of those living with MCCs within the community. There were several outcomes associated with improving care management for these patients, and they include: a reduction in hospital admissions and ED visits; improved
coordination of care between primary care and specialty care; coordination with social services; enhanced transitions among settings of care; and assurance of use of evidence-based practice guidelines specific to the patient’s chronic conditions. As a member of a shared savings ACO, and CMS’s CPC+ initiative, improvements in care were also required to remain cost-effective. 

In order to assess the cost-effectiveness of the CCM program, a ROI analysis was conducted based on the three different payment models for the three practices within the PHO with CPC+ designation.

There were three practices within the PHO that received track one designation from CMS as members of the CPC+ initiative. The first was an independent provider practice consisting of one physician, one nurse practitioner, and one case manager of 0.4 full time equivalent (FTE). The practice was a designated patient-centered medical home (PCMH). For that practice, 45% of the patients who were receiving case management were Medicare beneficiaries. The second practice was also a PCMH that had five physicians and employed two case managers totaling 2.0 FTE. Thirty-one percent of the total care management services were provided to Medicare beneficiaries at that practice. The third practice consisted of seven satellite locations throughout northern Michigan. There were 13 physicians and 15 advanced practice providers. There were seven case managers, 7.0 FTE total, that provided 19% of care management services to Medicare beneficiaries through the seven locations.

**Implementation Model**

One method to assess the financial return of quality improvement programs is through a ROI analysis. The ROI analysis for this project was a comparison of three different payment models for CCM. AHRQ developed a ROI estimation tool. This was utilized as a step-by-step guide for the evaluation. AHRQ developed the guide as part of its quality indicators toolkit for
hospitals. However, the principles of the tool can be applied across a variety of settings. The tool can be utilized for either planning or evaluating quality investments. For this analysis, it was utilized for evaluating the current CCM program. When used as an evaluation tool, it can assess the value of a current program and be utilized to make informed decisions in the future (AHRQ, 2014d).

ROI demonstrates “how much financial gain can be obtained for each dollar invested in the quality improvement program” (AHRQ, 2014d, p.1). ROI takes into account both financial gains and investment cost. The evaluation of these two financial estimates creates a ratio. This was reflected in the following formula which was used to calculate the ROI ratio:

\[
\text{ROI} = \frac{\text{Net return from improvement actions}}{\text{Investment in improvement actions}}
\]

The numerator of the equation includes all financial gains from the implemented program. This can include financial gains that are generated from quality, efficiency, utilization of services or payments for those services (AHRQ, 2014d). The denominator includes the costs of developing and operating the implemented program. The AHRQ toolkit utilizes three main steps that guide ROI evaluation. The three steps were precisely followed for the scholarly project (see Table 1).
Table 1

<table>
<thead>
<tr>
<th>AHRQ Quality Indicators Toolkit ROI Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong> Determine the ROI Design</td>
</tr>
<tr>
<td>Define Scope:</td>
</tr>
<tr>
<td>• CPC + designated practices</td>
</tr>
<tr>
<td>Define Timeline:</td>
</tr>
<tr>
<td>• 5 years</td>
</tr>
<tr>
<td>Identify Comparison Models:</td>
</tr>
<tr>
<td>• CPC+ in an ACO</td>
</tr>
<tr>
<td>• CPC+ alone</td>
</tr>
<tr>
<td>• CPT codes alone</td>
</tr>
<tr>
<td><strong>Step 2:</strong> Calculate the ROI</td>
</tr>
<tr>
<td>Calculate Costs:</td>
</tr>
<tr>
<td>• Training</td>
</tr>
<tr>
<td>• Personnel</td>
</tr>
<tr>
<td>• Equipment/supplies</td>
</tr>
<tr>
<td>• Travel</td>
</tr>
<tr>
<td>• Information systems</td>
</tr>
<tr>
<td>• Population health database</td>
</tr>
<tr>
<td>Calculate Revenue:</td>
</tr>
<tr>
<td>Direct Reimbursement:</td>
</tr>
<tr>
<td>• Per member per month</td>
</tr>
<tr>
<td>• Billing CPT codes</td>
</tr>
<tr>
<td>Quality Improvement:</td>
</tr>
<tr>
<td>• Incentive payment</td>
</tr>
<tr>
<td><strong>Step 3:</strong> Interpret the ROI</td>
</tr>
<tr>
<td>Three possibilities:</td>
</tr>
<tr>
<td>• ROI &gt; 1</td>
</tr>
<tr>
<td>• ROI &lt; 0</td>
</tr>
<tr>
<td>• ROI between 0-1</td>
</tr>
</tbody>
</table>

**Step One: Determine ROI Design**

The first step to the ROI analysis is determining the approach to the ROI (AHRQ, 2014d). This step includes defining the scope, the timeline, and comparison groups. The scope of the ROI analysis included the three practices within the PHO that obtained track one CPC+ recognition. In order to do this, an exemplar model was used as a framework to guide assumptions. The model was then broadened to all remaining practices. The initial intent of the project was a forecast for the upcoming five years, which was the length of the CPC+ designation. In order to accurately evaluate the ROI over five years, adjustments for inflation, future costs and revenues would have needed to occur (AHRQ, 2014d). The project utilized the three different payment models (CPC+ without an ACO, CPC+ within an ACO, and CPT alone) as the comparison calculations.
Step Two: Calculate ROI

The second step of the tool is to calculate the ROI. There are numerous considerations when estimating the financial portions of the denominator and numerator of the ROI. For the denominator, costs will vary depending on the stage of implementation of the program (AHRQ, 2014d). The CCM program was already in place at the PHO. Therefore, cost evaluation focused on ongoing operation, monitoring, and maintenance of the program (AHRQ, 2014d). Costs associated with this stage of the program included: personnel, supplies, equipment, training, information systems, travel, and a population health database.

Assessing the aspects that make up the numerator, or the financial gains, of the program are more complex (AHRQ, 2014d). The financial gains can occur in direct reimbursement or from improvements in patient outcomes and health status (AHRQ, 2014d). In this project, incentives for improving quality of care were provided in two of the payment models used for the ROI. The measurements utilized for these incentives are discussed within the project design description. After the estimations of the numerator and denominator were performed, the calculation of the ROI ratio occurred by dividing the estimated net return by the program costs (AHRQ, 2014d). This provided the ROI for interpretation within each payment model.

Step Three: Interpret ROI

The third step is to interpret the ROI ratio. The ROI ratio could result in one of three scenarios. The first is if the ROI is greater than one. When this occurs, the revenue is greater than the cost of the program (AHRQ, 2014d). This is considered a positive result for the organization. The second result is if the ROI is less than zero. If the ROI is less than zero, then the program results in a net loss. This is considered a negative result for the organization in that the program costs more than its net return in revenue. The third result is if the ROI is between
zero and one. With this result, the program does “provide a net return but the return is too small to fully recover the implementation cost” (AHRQ, 2014d, p. 6). Therefore, this result is also considered to be negative from the organization’s perspective (AHRQ, 2014d).

Need and Feasibility Assessment of the Organization

The setting for this scholarly project was a PHO in northwestern lower Michigan. A PHO is the integration of physicians and hospitals into a health delivery network with the goal of joint risk sharing, developing standards of care, and building trust between hospitals and physicians (Affinia Health Network, 2016). The PHO was comprised of area ambulatory care practices that work closely with the community hospital. The organization had a total of 12 primary care practices and 22 specialty offices that were members of the PHO (Wexford PHO, 2015). The organization was led by a board of directors that included both ambulatory care and hospital leadership. The PHO was also a member of an ACO. An ACO participates in a Medicare shared savings program. The goal of the program is to improve the quality of care for Medicare FFS beneficiaries (CMS, 2016). Within an ACO program, CMS will direct financial reward or penalties to the ACO based on its meeting quality performance measures.

The PHO served a wide area of counties throughout northern Michigan. The percentage if client of the main county served that were over 65 years of age was 17.6%. This was higher than the national average of 15.4% (Munson Healthcare Cadillac Hospital, 2016). Growth of this population of older adults had increased 2% in the previous five years. It was assumed that this trend would likely result in a growing body of Medicare beneficiaries who may require CCM services as the population was aging at an accelerated rate.

The CCM program started over five years before this project, as part of a combined demonstration project. In 2011, Michigan was selected as one of eight states to participate in a
primary care demonstration project funded by CMS to promote PCMH practices (Wensky, 2016). The CMS initiative was called the Multi-Payer Advanced Primary Care Practice (MAPCP) demonstration. This program joined the MiPCT demonstration with the purpose of integrating community-based resources into advanced primary care practices (Wensky, 2016).

A thorough organizational assessment was conducted to identify strengths, weakness, opportunities, and threats to the PHO’s CCM program (see Appendix C). Strengths of the program included its embedded structure, utilizing patient registries for identification of high-risk beneficiaries, and its targeting of services to this subpopulation. It had a standardized training process that consists of two training sessions with the Michigan Care Management Resource Center that addressed care management and enhancing patient self-management, and a curriculum on disease management standards of care. Each case manager had a minimum of 50 to 100 clients, with a productivity goal of making 10 patient contacts per day where it be telephone or face-to-face.

There were weaknesses to the CCM program. The program lacked an information system that allowed tracking of case management practices across all electronic health records (EHR). Instead, the case managers documented in the practice’s EHR in the office in which they were assigned. An EHR that does not allow for interoperability and coordination across a variety of settings is a barrier to sustainability (McCarthy et al., 2015). At the centralized offices, the program was using an Excel worksheet format to document patient contacts. Documentation occurred by designation of length of contact within defined ranges of time. This hindered accuracy in quantifying actual case management service time. The system was also a potential source of user error if care managers failed to accurately document billable services. This could result in lost revenue.
Opportunities available for the sustainability of the program included the CPC+ designation. This allowed for reimbursement of CCM services under Medicare. The MiPCT demonstration was also expected to be continued until 2019 as part of the state innovation model (SIM) and to provide reimbursement through Medicaid. Additional reimbursement from commercial payers (Priority Health, Blue Cross Blue Shield, Blue Care Network) provided approximately 52% of the reimbursement for the program.

The funding was expected to continue at an even rate as there was limited competition from other sources providing the same service. Based on the needs of the community, the number of patients requiring case management within Medicare was likely to increase as the population continued to age. However, the external threat of Medicare payment reform posed a barrier to the program’s sustainability, which was not resolved as the scholarly project concluded.

A threat to the CCM program was the changing payment structure under Medicare. The complexity of the payment models created significant confusion for administrative staff (Holtrop et al., 2015). A potential threat was the loss of participants under the CPT payment model. This model required a 20% copayment for services, which could result in a loss of participants. An additional threat was the manner in which the CPC+ funds were received by the PHO. The funds were reimbursed to the individual practices, which created confusion regarding the PHO’s role in the CPC+ initiative for those practices.

Payment Models

There were three different payment models that provided reimbursement for CCM services under Medicare that were included in this ROI analysis. The three payment models were: (a) CPC+ alone; (b) CPC+ as a member of an ACO; and (c) utilizing CPT codes from the
physician FFS schedule. The payment structure and organizational requirements vary under each model.

**CPC+**

One source of funding for CCM was provided through the CPC+ initiative. CPC+ builds upon the results of the original CPC initiative, which achieved significant gross savings and quality results (CMS, 2016b). The CPC+ initiative brought together CMS, Medicaid, and commercial insurance payers to provide financial support for primary care practices in order to make fundamental changes to improve patient health and lower healthcare costs (CMS, 2016b). Commercial payers that were a part of the initiative in Michigan included Priority Health and Blue Cross Blue Shield (CMS, 2016d). At the conclusion of the project, CPC+ was expected to be a five-year initiative which began in 2017. Practices were eligible to participate if they fell within one of the 14 CPC+ regions (CMS, 2016b). CMS expected that each practice would participate for the full five years of the demonstration, but withdrawal could occur without penalty (2016b). There were two tracks, track one and track two. Each track had different requirements and payment models for CCM services (CMS, 2016c). Three practices within the PHO received track one recognition, including the exemplar model practice for this financial analysis. The cost analysis for this project focused on practices with CPC+ track one designation, because track two practices had additional requirements and reimbursement followed a different payment structure. Only one practice within the PHO had received track two designation.

**Requirements**

Track one requirements for CPC+ were extensive. The practice was expected to use a certified health information technology (IT) that allowed for reporting of electronic clinical
quality measures (eCQMs) (CMS, 2016b). The health IT was required to be able to filter data based on practice and provider (CMS, 2016b). The practices were allowed to utilize a third party, for example, a registry or health information exchange, to report eCQMs if it followed the above CMS requirements (CMS, 2016b). The practice was required to provide 24/7 access for patients (CMS, 2016b). There were also five care management specific requirements, which included: the ability to risk stratify patients; provision of longitudinal care management to high risk patients; provision of episodic care management to those in transitions; ensuring that patients who visited the ED received follow-up within one week; and ensuring a minimum of 75% of those recently hospitalized had follow-up within two business days (CMS, 2016f). Care managers were required to develop and update an individualized patient care plan within a timely manner. Within CPC+, there were no payment requirements for the patients if they participated in CCM services.

**Payment**

As part of CPC+, practices were reimbursed through a non-visit based care management fee (CMF) and a performance-based incentive payment (PBIP) (CMS, 2016b). The non-visit based CMF was paid out in a PMPM fee for the Medicare FFS beneficiaries attributed to the participating practice (2016b). Beneficiaries were attributed to the practice based on the majority of their primary care charges over the past 24 months or by the most recent visit occurring at the practice (CMS, 2016b).

The average CMF payment for track one was approximately $15 PMPM. Payment was allocated across four risk tiers based on risk stratification score. Stratification of patients by their risk levels was thought to make case management more affordable and manageable (Leavitt, 2006). Risk tiers were determined by CMS hierarchical condition category (HCC) scores from
the previous year. CMS HCC risk scores predicted relative expenditure risk due to patient characteristics such as age, sex, income, disease groups. (Pope et al., 2011). Payment adjustments were made based on the risk in relation to Medicare beneficiaries within a regional reference population (Pope et al., 2011). Higher tiers represented beneficiaries with higher predicted risk of expenditures (Pope et al., 2011). Higher risk beneficiaries had serious illness, MCCs, and required more care, and therefore had higher medical costs (Pope et al., 2011). Tier 1 consisted of beneficiaries within the first quartile of HCC, tier 2 for the second quartile of HCC and, so forth. The payments for tier 1, 2, 3, and 4 were $6, $8, $16, and $30 respectively (see Table 2) (CMS, 2016b). As illustrated, the higher the predicted risk, the higher the payment received.

<table>
<thead>
<tr>
<th>Risk Tier</th>
<th>Attribution Criteria</th>
<th>Track 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>1st quartile HCC</td>
<td>$6</td>
</tr>
<tr>
<td>Tier 2</td>
<td>2nd quartile HCC</td>
<td>$8</td>
</tr>
<tr>
<td>Tier 3</td>
<td>3rd quartile HCC</td>
<td>$16</td>
</tr>
<tr>
<td>Tier 4</td>
<td>4th quartile HCC for Track 1</td>
<td>$30</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>$15</td>
</tr>
</tbody>
</table>

Notes. Payment provided PMPM

There were two components to the PBIP. The first component was determined by performance on quality measures and patient satisfaction. These were determined by performance on eCQM and Consumer Assessment of Healthcare Providers and Systems (CAHPS) measures (CMS, 2016b). The second component was the utilization performance. The utilization performance was measured based on utilization of ED visits and inpatient
hospitalizations per 1,000 attributed beneficiaries (CMS, 2016g). Utilization data were gathered from the Healthcare Effectiveness Data and Information Set (HEDIS).

Payment for the quality component of the PBIP required that the practice report on all nine eCQMs and the CAHPS score. At the conclusion of the project, practices received this payment prospectively. The payment would be reconciled at the end of the 2017 reporting period. If a practice met the annual performance requirements, it kept the payment. If it did not meet the requirements, it would be required to repay all or a portion of the prospective payment back to Medicare (CMS, 2016b).

CMS set forth performance benchmarks for each measure at the start of the performance year. If a practice met the 50th percentile on all nine eCQMs and the 30th percentile on CAHPS, then the practice retained the percentage amount based on the performance on each individual measure (see Appendix D). If the practices met the 80th percentile on at least six of the ten measures, then it retained the full quality component of the PBIP. In order to be eligible for the utilization component of the PBIP, the practice had to meet the 50th percentile on all nine eCQMs and 30th percentile on CAHPS score. The percentage of the utilization component of the PBIP retained was based on the performances on each of the two utilization measures (Centers for Medicare and Medicaid Innovation [CMMI], 2017). As part of CPC+, practices were ineligible to bill for CCM under the Medicare FFS using CPT codes (CMS, 2016b). Aspects of this payment model would change if a practice was a member of a shared savings program.

**ACO and CPC+**

An ACO is a group of healthcare providers who voluntarily join together to provide coordinated, high quality care to Medicare patients (CMS, 2015c). Medicare enters into a shared savings program with the ACO. If the ACO is able to lower the expenditure growth of Medicare
FFS beneficiaries, and meet performance standards, Medicare will reward the ACO with a portion of the Medicare savings (CMS, 2015b).

**Requirements**

Practices that were participating in both CPC+ and an ACO were responsible for reporting requirements set forth by both CPC+ and the ACO (CMS, 2016b). In order to qualify for shared savings, the ACO was required to meet the prescribed minimum savings rate (MSR) and minimum quality performance standards (CMS, 2016a). The MSR was set to ensure Medicare was rewarding true cost savings, rather than normal fluctuations in expenditure (CMS, 2015b). The MSR was set at 2% for ACOs with 60,000 or more beneficiaries (CMS, 2015b). If the ACO met those requirements, it was eligible to share in the savings of up to 50%, based on quality performance (CMS, 2015b).

**Payment**

The payment structure under CPC+ changed if the practice was a member of an ACO. The practice received the same non-visit based CMF, but forfeited the PBIP (CMS, 2016b). Instead, practices would continue with the ACO’s shared savings and shared loss agreement (CMS, 2016b). Within this shared savings model, the savings were based on the CMS beneficiary attribution, as well. Savings that were accrued by the ACO would be distributed by 70% of participant savings to primary care and 30% to specialty care, after overhead administration fees were retained.

**CPT Billing**

Practices without CPC+ designation were eligible to bill for CCM services under the Medicare FFS, in the form of CCM CPT codes. These codes began in January 2015. CPT 99490 was paid out for a minimum of 20 minutes of CCM services PMPM. Following the
initiation of billable CCM codes in January 2015, the services were significantly underutilized. As a result, Medicare provided enhanced billing codes that accounted for the nature of providing services to highly complex patients. The complex care management billable code CPT 99487 required care management of a minimum of 60 minutes per month. Additionally, CPT 99489 was an add-on code for complex patients for each 30 minute increment beyond the initial 60 minutes (Ross, 2016).

**Requirements**

CPT billing required that beneficiaries had two or more chronic conditions that were expected to last at least 12 months, and placed the patient at risk of exacerbation, functional decline, or death (CMS, 2015a). For full reimbursement, practices were required to meet the following process requirements: (a) documented within the patient’s medical record that CCM services were provided; (b) developed an electronic care plan that could be made available in a timely manner; (c) provided assistance with care transitions; and (d) have had a provider visit within twelve months of CCM services (Ross, 2016). Documentation of services rendered were provided within the patient’s health record and once the above time requirements were achieved the service could be billed.

Medicare would only pay out one claim PMPM. Within the same calendar month, a provider could not bill for transitions of care (CPT 99495 or 99496), home health (HCPCS G0181), hospice care supervision (HCPCS G0182), or end stage renal disease services (CPT 90951-90970) (Pershing Yoakley & Associates [PYA], 2015). However, transitions of care codes could be billed in the same month if the 30-day transition period ended before the end of the month, and 20 or more minutes of CCM services were provided by the end of the calendar month (PYA, 2015). CCM services were still subject to cost-sharing requirements of Medicare.
part B which required the patient to be responsible for a 20% copayment and any further deductibles (PYA, 2015).

**Payment**

Without CPC+ recognition, practices were required to furnish CCM services by billing according to the Medicare FFS described above. The payment for CPT 99490 for performance year 2017 was $42.21. For complex patients requiring CPT 99487 the payment for reimbursement was $92.66. For every additional 30 minute period beyond that, CPT 99849 could be billed for a reimbursement of $46.87. Providers stated that it required an extensive amount of time to develop an appropriate care plan. To address this concern, Medicare provided reimbursement for a compressive assessment and care planning by the physician or other qualified health provider, allowing for separate billing of GPPP7 with a reimbursement of $63.68 (Ross, 2016).

The three payment models varied significantly in the reimbursement provided to the practice for the delivery of CCM services (see Table 3). Successful implementation and ensured quality improvement requires frequent formal and informal assessments of effectiveness of the change (Caldwell, Butlers, & Poston, 2009). A ROI analysis is one method for assessing the effectiveness of quality improvement. The ROI calculation could be utilized by the organization to continue to make future decisions surrounding the CCM program as various initiatives evolved. This project assessed the ROI of the existing CCM program, with its structure and processes for Medicare beneficiaries with MCCs, under these three payment models.
**Project Plan**

**Purpose**

The sustainability of the CCM program was essential to providing quality and cost-effective care to this population residing in the community. The intent of this DNP scholarly project was to assess the ROI of the operating CCM program within the three payment models, to evaluate the financial return of the program at the practice level. There were two goals of the project, which included: (a) conducting the ROI analysis within each payment model, and (b) interpreting the ROI ratio within each payment model. The ROI analysis was utilized as an

---

**Table 3**

*Estimated Reimbursement within Three Payment Models*

<table>
<thead>
<tr>
<th>Per member per month payment</th>
<th>CPC+ not a Member of an ACO</th>
<th>CPC+ as an ACO Member</th>
<th>CPT Reimbursement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentives</td>
<td>$15 average**</td>
<td>$15 average**</td>
<td>None</td>
</tr>
<tr>
<td>G Code Billing</td>
<td>$2.50 performance based **</td>
<td>Based on ACO shared savings agreement</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>$1.25 for patient satisfaction and quality metrics</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$1.25 for utilization metrics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Annual Reimbursement</td>
<td>$315,000 per year + 99490</td>
<td>$270,000 per year + 99487</td>
<td>$58,846 ^^</td>
</tr>
<tr>
<td></td>
<td>99489</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GPPP7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.* ** Denotes a per member per month incentive payment + Based on 1500 attributed beneficiaries ^^ Estimated based on quarter 2 2016 projectivity
evaluation tool, which would allow the organization to assess the value of the current program and aid in future improvement actions.

**Type**

The project strictly assessed financial return. It was neither clinical nor technical; therefore, not carried out on the rigors of controlled research (Donabedian, 1988). Instead, it was one of cost-to-benefit ratio. ROI can be utilized after practice improvements have been implemented and is an approved AHRQ method to assess quality improvement. It allows the organization to predict the value of the expenditure of the CCM program on the organization’s bottom line. By comparing the three payment alternatives, the organization could identify which alternative had the largest payoff for the investment.

**Setting and Needed Resources**

The setting for this ROI analysis was a PHO in northwestern lower Michigan. The needed resources to complete the project included: billing and productivity data, data from a population health database, quality metric scorecards from various payers, and collaboration with the PHO’s data analyst. The ROI analysis for the CPT billing only payment utilized 2016 data to project 2017 reimbursement. The data for case manager productivity and billing were available through the PHO’s shared database. Data regarding quality metrics and utilization were generated from multiple payer resources. The collection of HCC data and data regarding annual wellness visits (AWVs) required the collaboration with a data analyst employed by the PHO, the budgetary resources for which are described below as the ROI is explained.

**Design for Evidence-based Initiative**

The design for this evidence-based initiative followed the exact steps provided by the AHRQ toolkit for assessing ROI. The estimates of the invested costs were gathered to compose
the denominator of the ROI ratio. The expected return for the quality improvement made up the numerator, and included the various reimbursements from the payment models. In order to calculate these estimates, the exemplar model was utilized to infer average attributed beneficiaries per practice and case manager productivity.

**Exemplar Model**

The project’s analysis utilized data and productivity estimates based on an exemplar model to inform assumptions about the remaining practices. The exemplar model practice was chosen based on its case manager characteristics and portion of CCM services that were provided to Medicare beneficiaries. The case manager had over five years of experience providing case management services for the practice. By utilizing this model, it accounted for confounding variables of case manager experience, case manager turnover, and the relationship with staff. The identified case manager was employed as a 1.0 FTE. Medicare beneficiaries comprised 31% of her patient panel. This percentage was similar to the total CCM program in which 24% of all case management services were provided to Medicare beneficiaries.

**Denominator**

Since the CCM program was already in place, the cost analysis was conducted based on the stage of ongoing operation, monitoring and maintenance. It included costs accrued from personnel (salary, insurance, and payroll taxes), equipment and supplies, training and education, travel expenses, and the external population health IT database.

**Numerator**

The numerator contained revenue generated by the three payment models. The calculation of the net return from quality was more complex. The complexity existed in the reporting of quality indicators in order to achieve the PBIP. Assumptions regarding billing CPT
codes were inferred from the exemplar model productivity. Utilizing the ROI toolkit, the following ROI equation guided the final ROI analysis:

\[
\text{ROI} = \frac{\text{CMF} + \text{PBIP} (\text{quality indicators} + \text{patient satisfaction} + \text{utilization incentive}) + \text{shared savings allocation} + \text{CPT billing (99490 + 99487 + 99489 + GPPP7)}}{\text{Personnel (salary and insurance) + training + equipment and supplies + travel expenses + population health registry cost}}
\]

**Measurement: Data and Tools**

The allotted Medicare beneficiaries, for the exemplar model practice according to the 2017 CPC+ attributed patient registry, were utilized to estimate the CMF and PBIP. Information made available by the ACO on the risk stratification of the exemplar practice panel provided the necessary data for the CMF, based on HCC risk stratification tiers. One of the complexities of evaluating the ROI of quality improvement was identifying the notion of quality, and quantifying that (Hubay, 2014). Reporting of quality measurements was required in order to qualify for incentive payments within the CPC+ model and for retrospective allocation within the shared savings model of the ACO.

The quality and patient experience aspect of the PBIP was based on eCQM and CAHPS metrics (CMS, 2016b). CMS required that eCQMs be reported at the practice-site level (CMS, 2016b). The utilization measures for the PBIP were based on claims-based measures (CMS, 2016b). The claim-based measures for this project included inpatient admissions and ED visits as dictated by the CPC+ implementation manual. These data were generated by HEDIS information and were reported at the practice level as well. The utilization data were provided
by inpatient hospital utilization per 1,000 attributed beneficiaries and ED utilization per 1,000 attributed beneficiaries (CMMI, 2017). As discussed, the exemplar model productivity served as the guide during the analysis of projected billing potential for CPT code payments.

Practices were directed by CPC+ requirements to follow the latest measure update for reporting of eCQM (CMS, 2016b). The required reporting for performance year 2017 is provided in Appendix E. This included two of three outcomes measures, two of four complex care measures, and five of the remaining ten measures from the above categories or group 3 measures. At the time of the project completion, it was anticipated that at close of the 2017 reporting year the CPC+ practices would report on at least nine of the 14 measures in the CPC+ eCQM set, CAHPS score, and utilization measures.

The overall results of the analysis provided costs of the program in annual total cost, as well as in PMPM fee. It included the breakdown of the costs of the CCM program based on the practice as a whole. The numerator analysis was also provided in a total annual revenue and the projected PMPM revenue based on the model’s reimbursement. The final analysis provided the ROI ratio for the three payment models, which allowed for comparison of the cost-benefit analysis across the three models. The information gathered from this ROI analysis could then be utilized for program expansion, communication of results to stakeholders, and for addressing areas for program improvement (AHRQ, 2014c).

**Steps toward Implementing Project**

The implementation of this DNP project followed a stepwise approach. The proposal of the project was defended to the student’s institutional advisory committee on February 8, 2017 with immediate approval to proceed in addressing the project objectives. On February 23, 2017, the university’s human research review committee made the determination that the project did
not meet the definition of human subjects research under federal regulations and could proceed as a quality improvement investigation (Appendix F). Between February 24, 2017 and March 7, 2017, data concerning the program’s costs and the practice’s quality performance were gathered at the practice level via reports and scorecards generated by payers, and the three ROI were calculated. The results of the analysis were disseminated in a final report which was presented to the project advisory committee on March 14, 2017 and were communicated during the final defense of the project on April 20, 2017. A timeline outlining each individual phase of the project is included in Appendix G.

**Project Evaluation Plan**

The ROI analysis results were presented to the organization’s leadership team and the project advisory committee for feedback and evaluation. The ROI analysis was provided in a final report and in a Microsoft Excel format. A Microsoft Excel ROI template was also presented to the organization, which could then be utilized to conduct future ROI analyses. The final DNP project written report was submitted to the DNP project advisory committee for approval. Upon approval, the dissemination of the results of the DNP project occurred.

**Budget**

There were costs associated with the proposed project. Collaboration did occur with the organization’s data analyst, who conducted the distribution of attributed beneficiaries into their allocated HCC risk tiers and collected data on the practice’s AWVs. It was estimated to take approximately five hours to conduct this aspect of the project. Therefore, the cost incurred by the organization for this time was approximately $350. The gathering of data for the analysis was completed by the DNP student, who also performed the analysis. The total estimated time to
complete the analysis was 120 hours. Assuming an hourly rate of $46.16, the total cost to the practice to outsource the analysis is estimated at $5,539.20.

**Institutional Review Board**

The project was specific to the setting of the organization and was not meant for generalizability to other settings. Data were collected under protocols that de-identified information. The details of this project were presented to the institution’s human subjects research review committee for review. It was determined by the review committee that this scholarly project was not considered to be research (Appendix F). After determination by the review board, the project was conducted.

**Project Outcomes**

The project design followed the AHRQ ROI toolkit steps. The following section describes the processes, rationale, and results during each step of the implementation model.

**Process: Step 1**

During the implementation of the project, changes to the process in step one had to occur. In step one of the ROI toolkit, the timeline for the analysis is defined. The proposed plan was to predict an ROI for the upcoming five years, from 2017 to 2021. This ROI was going to utilize quality metric data from the previous years (2013, 2014, 2015, 2016) to predict future scores using Microsoft Excel and its trendline function. Excel’s trendline function is a least squares line. With this type of trend, there will always be a margin of error, as data never fits a straight line. The accuracy also depends on the amount of data in the original analysis.

The significance of the trend depends on the volume of data analyzed (Bryhn & Dimberg, 2011). In order for the time trend to be statistically meaningful, three intervals in the time series are necessary to account for this type of test (Bryhn & Dimberg, 2011). The data available must
accurately represent the care that is provided to patients (The Office of the National Coordinator for Health Information Technology [TONCHIT], 2013). High quality data refers to data that are reliable, accurate, and actionable (TONCHIT, 2013). The data available for 2013 and 2014 collection years were inaccurate.

EHR-derived quality data has limitations in accuracy based on variations in the EHR’s content, structure, and data format. It is also limited by the ability to capture and extract the data (TONCHIT, 2013). In order to calculate and report on eCQMs, the EHR structure must have the ability to: (a) capture the structured data; (b) extract these data from multiple sources within the EHR; and (c) run a measures logic to apply the rules of the measures (Ahmad & Tsang, 2012).

Data can be in various forms within the EHR, which makes it difficult to query through data mapping (White, 2016). As a result, numerator values can be lost and underestimate the delivery of those measures (Garrido et al., 2013). The interfaces within the organization’s EHR to collect the data for the quality metrics, according to the organization, were not sufficient during the 2013 and 2014 years. This resulted in significantly lower collected quality measure scores, that did not accurately reflect patient care. As a result, when the trend function was utilized, using 2013, 2014, and 2015 data, predicted outcomes were significantly lower than expected.

According to the organization, data from 2015 represented high quality data that was reliable and accurately depicted patient care. The 2016 data were also anticipated to reflect accurate quality scores; however, the 2016 year-end data were not yet available in completion during implementation of the project. Due to these limitations in data accuracy, the ability to trend future predictions would be of little significance. As a result, the actual implementation process was adjusted to reflect a ROI analysis for one year of 2017 (see Table 4). This analysis utilized the 2015 quality metric data, as it represented the highest quality data available.
Table 4

<table>
<thead>
<tr>
<th>Process Change to the ROI Design in Step One</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Proposed Analysis- the ROI Design</strong></td>
</tr>
<tr>
<td>Define Scope:</td>
</tr>
<tr>
<td>• CPC + designated practices</td>
</tr>
<tr>
<td>Define Timeline:</td>
</tr>
<tr>
<td>• 5 years</td>
</tr>
<tr>
<td>Identify Comparison Models:</td>
</tr>
<tr>
<td>• CPC+ in an ACO</td>
</tr>
<tr>
<td>• CPC+ alone</td>
</tr>
<tr>
<td>• CPT codes alone</td>
</tr>
<tr>
<td><strong>Step 1: Actual Implementation- The ROI Design</strong></td>
</tr>
<tr>
<td>Define Scope:</td>
</tr>
<tr>
<td>• CPC+ track one designated practices</td>
</tr>
<tr>
<td>Define Timeline:</td>
</tr>
<tr>
<td>• 1 year 2017</td>
</tr>
<tr>
<td>Identify Comparison Models:</td>
</tr>
<tr>
<td>• CPC+ in an ACO</td>
</tr>
<tr>
<td>• CPC+ alone</td>
</tr>
<tr>
<td>• CPT codes alone</td>
</tr>
</tbody>
</table>

**Process Step 2**

The second step of the AHRQ ROI toolkit was to gather denominator costs, estimate numerator revenue, and conduct the ROI.

**Denominator Costs**

Denominator costs were collected based on the ongoing operation of the current program. Costs during this stage of the program included: personnel salary, insurance, and payroll taxes; equipment such as a computer, phone, wireless headset, keyboard, and monitor; training and education; and travel expenses. The total personnel costs to the exemplary practice included the cost of 1.6 FTE case managers, which were needed to provide services to the practice’s population. This was determined by approximately 1 case manager per 2500 patients. Salary costs were determined utilizing the highest pay rate for the pay scale. Payroll taxes and insurance costs were estimated based on 24% of the annual salary per case manager. Equipment costs included the total cost to replace or purchase all necessary equipment each year. Training and travel expenses were determined by the organization, which allocated a set amount annually for those expenses.
The organization utilized a population health registry database to conduct CCM services. Wellcentive® is a population health management cloud-based IT solution that aggregates and analyzes clinical, claims, and financial data across health systems (Philips Wellcentive, 2017). Wellcentive was put in place during the MiPCT demonstration to aid in CCM services by addressing gaps in care. The total cost for the population health IT included a yearly rate per provider, and an additional annual cost for interface development and maintenance. The cost for the exemplar practice was calculated utilizing the number of providers at the practice. The interface total cost was estimated by dividing the total cost by the number of practices participating in its use. This resulted in the estimated cost of the exemplar practice for utilization of the population health IT database. The following equation was utilized to calculate total program costs:

\[
\text{Total Costs} = \text{Personnel (salary and insurance)} + \text{training} + \text{equipment and supplies} + \text{travel expenses} + \text{population health registry costs (interfaces and provider cost)}
\]

The following represents the denominator costs to the CCM program for the practice based on the above equation:

\[
\text{Total costs} = ((\$72862.40 + \$17486.98) \times 1.6) + \$1000 + \$4706.94 + \$2400 + (\$1149.47 + \$6250)
\]

The total annual cost of the CCM program at the exemplar practice was estimated at $154,184.57. This translates into approximately $9.51 PMPM.

**Numerator Revenue: CPC + without an ACO**

In order to calculate the estimated numerator for CPC+ track one practices, without being a member of the ACO, a Microsoft Excel spreadsheet was created. CPC+ revenue was provided based on a CMF and a PBIP. To estimate this ROI, the total number of Medicare beneficiaries
was provided by the exemplar practice’s CPC+ attributed beneficiaries. For this analysis, 1402 attributed Medicare beneficiaries was the number utilized during calculation of the ROI. The categorization of those beneficiaries into their regional HCC risk score was completed by the organization’s data analyst utilizing Medicare HCC data. The beneficiaries were then distributed into their allotted risk tiers to calculate the CMF revenue for the exemplar practice. The result was approximately $214,728.00 in annual revenue (see Table 5), and $12.76 PMPM.

<table>
<thead>
<tr>
<th>Tier</th>
<th>Region risk Score</th>
<th>PMPM payment</th>
<th>Attributed Members</th>
<th>Monthly total</th>
<th>Annual total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.117-0.503</td>
<td>$6</td>
<td>557</td>
<td>$3342.00</td>
<td>$40,104.00</td>
</tr>
<tr>
<td>2</td>
<td>0.504-0.781</td>
<td>$8</td>
<td>326</td>
<td>$2608.00</td>
<td>$31,296.00</td>
</tr>
<tr>
<td>3</td>
<td>0.782-1.298</td>
<td>$16</td>
<td>259</td>
<td>$4144.00</td>
<td>$49,728.00</td>
</tr>
<tr>
<td>4</td>
<td>1.299-12.716</td>
<td>$30</td>
<td>260</td>
<td>$7800.00</td>
<td>$93,600</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>1402</td>
<td>$17,894.00</td>
<td>$214,728.00</td>
</tr>
</tbody>
</table>

The Microsoft Excel spreadsheet was utilized to input the calculations for the PBIP. The reimbursement formula calculations were taken from the CPC+ implementation guide for track one practices (CMMI, 2017). At the completion of the project, it was anticipated that the practice would report on all nine required eCQMs and patient satisfaction scores. In the payment calculation, each quality measure represented 8.33% of the total $1.25 PMPM reimbursement for quality component of the PBIP (CMMI, 2017). If the practice performed below the 50th percentile, no reimbursement was retained. If the practice performed above the 80th percentile, the full reimbursement was retained. If the practice performed between the 50th and 80th percentile, reimbursement was retained on a continuous distribution between 4 to 8.33% (CMMI, 2017).
Patient satisfaction, as reflected in the GC CAHPS summary score, provided 25% of the total $1.25 reimbursement for the quality component of the PBIP. After the completion of the project, the practice would be measured against the 30th percentile for patient satisfaction for the 2017 reporting period (CMMI, 2017). If the practice performed below the 30th percentile, the practice would not retain reimbursement. If the practice performed above the 80th percentile, the full reimbursement would be retained. Reimbursement would be provided along a continuous distribution between 12.5 and 25% if the practice performed between the 30th and 80th percentile (see Table 6) (CMMI, 2017).

The second component of PBIP included a utilization incentive totaling another $1.25 PMPM. The calculations for this incentive follow the same methodology as the PBIP with inpatient utilization accounting for 66% and ED utilization accounting for 33% of the $1.25 payment (CMMI, 2017).
Table 6

*Percentage of PBIP retained based on Performance*

<table>
<thead>
<tr>
<th>Performance for eCQMs</th>
<th>Percentage of PBIP Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50th percentile</td>
<td>0%</td>
</tr>
<tr>
<td>50th – 79th percentile</td>
<td>4 - 8.33%</td>
</tr>
<tr>
<td>80th percentile</td>
<td>8.33%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance on Patient Satisfaction</th>
<th>Percentage of PBIP Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 30th percentile</td>
<td>0%</td>
</tr>
<tr>
<td>30th - 79th percentile</td>
<td>12.5 - 25%</td>
</tr>
<tr>
<td>80th percentile</td>
<td>25%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inpatient Utilization</th>
<th>Percentage of PBIP for Utilization Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50th percentile</td>
<td>0%</td>
</tr>
<tr>
<td>50th - 79th percentile</td>
<td>33 - 66%</td>
</tr>
<tr>
<td>80th percentile</td>
<td>66%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency Department Utilization</th>
<th>Percentage of PBIP for Utilization Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50th percentile</td>
<td>0%</td>
</tr>
<tr>
<td>50th - 79th percentile</td>
<td>16.5 - 33%</td>
</tr>
<tr>
<td>80th percentile</td>
<td>33%</td>
</tr>
</tbody>
</table>

The performance benchmark goals for 2017 were established using data that were available prior to the start of the CPC+ program (CMMI, 2017). The benchmarks for the 2017 year are provided below for the nine eCQMs which would be reported by the practice at the close of the 2017 reporting period (see Table 7). These benchmarks were entered in the Microsoft Excel calculation that would be used to predict the reimbursement earned from the practice’s performance measures.
Table 7

Benchmark for Quality and Utilization Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>50&lt;sup&gt;th&lt;/sup&gt; Percentile</th>
<th>80&lt;sup&gt;th&lt;/sup&gt; Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling high blood pressure</td>
<td>63.60</td>
<td>75.34</td>
</tr>
<tr>
<td>Diabetes: Hemoglobin A1c above 9.0%</td>
<td>19.33</td>
<td>3.33</td>
</tr>
<tr>
<td>Dementia: Cognitive assessment</td>
<td>56.26</td>
<td>95.56</td>
</tr>
<tr>
<td>Fall risk screening</td>
<td>47.87</td>
<td>90.21</td>
</tr>
<tr>
<td>Cervical cancer screening</td>
<td>28.84</td>
<td>54.78</td>
</tr>
<tr>
<td>Colorectal cancer screening</td>
<td>33.46</td>
<td>67.92</td>
</tr>
<tr>
<td>Diabetes: Eye exam</td>
<td>94.12</td>
<td>99.99</td>
</tr>
<tr>
<td>Use of imaging for low back pain</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Breast cancer screening</td>
<td>40.87</td>
<td>63.07</td>
</tr>
<tr>
<td>GC CAHPS Summary score (30&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>78.77</td>
<td>83.44</td>
</tr>
<tr>
<td>Inpatient Hospital Utilization</td>
<td>1.17</td>
<td>0.89</td>
</tr>
<tr>
<td>ED utilization</td>
<td>1.42</td>
<td>1.07</td>
</tr>
</tbody>
</table>

*Note.* (CMMI, 2017).

The 2017 benchmarks were entered in the Microsoft Excel sheet. Then the collected 2015 quality scores for the exemplar practice were inputted against the above benchmarks. The 2015 scores for both dementia cognitive screening and fall risk assessment were based on the practice’s performance on AWVs. The guidelines for the AWV included that the provider assess for the detection of cognitive impairment, functional ability, and level of safety (CMS, 2011). The provider could select from standardized questionnaires to assess cognitive status and fall risk (CMS, 2011). It was assumed that the patients receiving an AWV were having standardized
cognitive and fall risk assessments. In 2015, 7.4% of the Medicare beneficiaries eligible for an AWV received one, which increased to 11.6% in 2016.

Based on 2015 quality scores for the exemplar practice, it was estimated that the practice would retain the full 8.33% payment on four of the nine measures, a partial payment on one measure, and no payment on the remaining four quality measures. The total quality component percentage retained and the estimated annual revenue is provided below.

Total quality component percentage retained = 8.33% + 5.84% + 8.33% + 8.33% + 8.33% 

= 39.16% retained

Estimated annual revenue = ($1.25 * 0.3916) * 1402 * 12 = $8,235.10

The practice did not retain the patient satisfaction incentive. Based on not achieving the 50th percentile on all nine eCQMs and not achieving the 30th percentile on CAHPS, the practice was ineligible to retain the utilization incentive. The annual PBIP estimated for 2017 amounted to $8,253.10, or $0.49 PMPM. The total estimated annual revenue for a CPC+ practice that was not a member of an ACO was estimated to be $222,963.10, or $13.25 PMPM. The ROI numerator equation for the project (see below) was utilized for the estimation.

Numerator Revenue = CMF + PBIP (quality indicators + patient satisfaction + utilization incentive) + shared savings allocation + CPT billing (99490 + 99487 + 99489 + GPPP7)

CPC+ not a member of an ACO annual revenue = $214,728.00 + $8,235.10 + 0 + 0 + 0 + 0

= $222,963.10

**Numerator Revenue: CPC+ as an ACO**

The numerator revenue for the ROI calculation for a CPC+ track one practice as a member of an ACO includes the CMF and the shared savings incentives based on the ACO.
Within this payment model, the CMF was calculated in the same manner as mentioned previously, resulting in approximately $12.76 PMPM. As a member of an ACO, the practice was ineligible for the PBIP. The practice had to follow the requirements of the ACO’s shared savings program. In order to be included in the shared savings with Medicare, the ACO must meet a MSR of 2%. The exemplar practice was a member of an ACO. The ACO membership started in 2013. Since 2013, the ACO had met the MSR one of those years. The ROI calculation utilized the distributed incentive to the practice for that year in which the MSR was achieved, which amounted to $33,817.50. If the ACO achieved the MSR in 2017 and a minimum of the previous allocated funds were distributed, total annual revenue would be $248,545.50, or $14.77 PMPM.

Numerator Revenue = CMF + PBIP (quality indicators + patient satisfaction + utilization incentive) + shared savings allocation + CPT billing (99490 + 99487 + 99489 + GPPP7)

CPC+ as an ACO member meeting MSR annual revenue = $214,728.00 + 0 + $33,817.50 + 0

= $248,545.50

If the ACO did not meet the MSR for the 2017 year, then there would be no shared savings allocation. The estimated annual revenue would only include the CMF, which amounted to an estimated $214,728.00 for the year, or $12.76 PMPM.

**Numerator Revenue: CPT billing only**

In order to estimate the revenue based on CPT billing, the exemplar practice case manager’s productivity from quarter two (April, May, June) 2016 was utilized for the analysis. Data were available on billing codes and total patient contact time. The total case management time PMPM was calculated utilizing this deidentified information. The averages were taken
from the three months to estimate the case management productivity per month. The case
manager provided an average of eight contacts per day during quarter two 2016.

Based on the 2017 time requirements to bill for CPT codes, the practice would be able to
bill for CPT 99490, 42.6 times; 99487, 13 times; and 99489, 12.6 times (see Table 8). GPPP7
provided reimbursement for physician annual discussion and signing of the care plan. This
revenue was estimated by assuming that 2% of the total Medicare beneficiaries receiving CCM
services would have the care plan signed by the provider. The total revenue was calculated by
multiplying CPT revenue estimates for 99490, 99487, and 99489 by 1.6 to demonstrate
productivity for the 1.6 FTE case managers at the practice. The total was calculated by adding
this to the estimated GPPP7 revenue. The estimated 2017 revenue for CPT code billing alone
resulted in approximately $70,776.72 annually, or $4.20 PMPM.

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>CPT Revenue</th>
<th>Member Count Meeting Eligibility per Month</th>
<th>Monthly Revenue</th>
<th>Annual Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>99490</td>
<td>$42.41</td>
<td>42.6</td>
<td>$1798.15</td>
<td>$21,577.75</td>
</tr>
<tr>
<td>99487</td>
<td>$92.66</td>
<td>13</td>
<td>$1204.58</td>
<td>$14,454.96</td>
</tr>
<tr>
<td>99489</td>
<td>$46.87</td>
<td>12.6</td>
<td>$59.56</td>
<td>$7,086.74</td>
</tr>
<tr>
<td>GPPP7</td>
<td>$63.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total for 1.6 FTE $68,991.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total for practice $1,785.59*</td>
<td>$70,776.72</td>
</tr>
</tbody>
</table>

* calculated by a total 1402 beneficiaries multiplied by 2%, multiplied by $63.86

Numerator revenue = CMF + PBIP (quality indicators + patient satisfaction + utilization
incentive) + shared savings allocation + CPT billing (99490 + 99487 + 99489 + GPPP7)
CPT billing annual estimated revenue = 0 + 0 + ($21,577.75 + 14,454.96 + 7086.74) * 1.6 + $1,785.59

= $70,776.72

Two other estimations were provided if case management productivity was increased to 10 patient contacts per day and 15 patient contacts per day (Appendix H). If productivity increased to meet those requirements, the estimated annual revenue would increase to $107,080.53 for 10 contacts and $153,522.93 for 15 contacts per day, which would result in $6.36 PMPM, and $9.12 PMPM respectively. The numerator revenue estimations for 2017 for each payment model in total annual cost (Figure 1) and PMPM (Figure 2) are depicted below.

**Figure 1: Total Annual Revenue Estimates per Payment Model for the Practice for 2017**
Calculating the ROI

The final process in step two is to calculate the ROI. The formula discussed previously was utilized for the ROI calculation. The ROI within each payment model was calculated based on the denominator cost of the CCM program and the estimated numerator revenue for each of the payment models as discussed above. The results are depicted at the practice level based on the calculations from the exemplar practice.

Results

The results of the ROI analysis for 2017 within each payment model are demonstrated in Figure 3. The largest ROI for CCM services was provided by the CPC+ as a member of an ACO that met the MSR, followed by CPC+ not a member of an ACO, followed by CPC+ as a member of an ACO that did not meet the MSR, and the smallest amount of return coming from CPT billing only. As a practice participating in CPC+ as member of an ACO that met the MSR, the
ROI resulted in a predicted return of $1.55 for every dollar the practice invests in the program. As a member of an ACO, the practice forgoes the PBIP. The ROI analysis for this model was $1.34 for every dollar invested. As a practice participating in CPC+ and not an ACO, the ROI was $1.39 for every dollar invested. When the productivity during quarter two 2016 was extrapolated to the new payment structure for 2017, the ROI for CPT billing alone was $0.44 for every dollar invested in the CCM program. If productivity increased to 10 contacts per day, the ROI increased to $0.67, and increased to $0.96 if productivity increases to 15 contacts per day.

![Estimated 2017 ROI per Payment Model for the Practice](image)

**Figure 3: Results of ROI Analysis for Projected Year 2017 at the Practice Level**

**Interpretation of Results: Step 3**

**CPC+ not a Member of an ACO**

The third and final step of the AHRQ ROI toolkit is to interpret the ROI. As a reminder, the ROI is the amount of financial gain that can be obtained for each dollar invested in the program (AHRQ, 2014d). When the ROI is greater than one, the quality improvement program is a positive investment for the organization (AHRQ, 2014d). For every dollar the practice
spends on the ongoing operation of the CCM program, it could expect to see a return of $1.39 as part of CPC+ and not in an ACO. This analysis provided a conservative approach to the ROI estimation. A conservative assessment to an ROI analysis includes all costs and conservative alternatives with revenue calculations (ROI Institute, 2013). With the costs, it is essential to fully load all expenditures of the program (ROI Institute, 2013). This was achieved by utilizing the maximum salary on the care management pay scale, and included the costs of all equipment. The ROI will further increase if the case manager salary is not at the highest step of the pay scale and if equipment, which was estimated to last three years, does not need to be purchased annually.

The above represents a conservative analysis for the numerator revenue, based on quality scores. It is expected that scores on quality metrics would continue to increase based on practice performance and the ability of the EHR to collect high quality data, which are then validated by the PHO’s quality information technologist. Any increase in quality scores at the practice level would result in an improved ROI, and represents an area of improvement for the practice to increase revenue.

**CPC+ as a member of an ACO**

The ROI for CPC+ practices as a member of an ACO was greater than a non-member of an ACO for meeting the MSR. Having met the MSR or not, both payment models resulted in a positive ROI for CCM services. The predicted ROI for meeting the MSR is $1.55 for every dollar invested. If the MSR is not achieved, the ROI decreases to $1.34. The estimated ROI for meeting the MSR, as part of the ACO shared savings model, used the exact distributed incentive payment from that year. However, this number is subject to change based on the total Medicare dollars saved by the ACO, and the retained administration fee for the ACO in that year. It is
essential to consider that the ROI can increase or decrease depending on the number of attributed Medicare beneficiaries to the practice, based on the CMF. As the population continues to age, those meeting Medicare eligibilities should also increase, demonstrated by the 2% increase in this population in the previous five years. These factors must be taken into consideration for the projected ROI analysis results. Another factor to consider in the future ROI for the CPC+ models is the attribution of beneficiaries based on the HCC risk score.

The HCC risk-adjustment payment model provides reimbursement based on the documented health conditions of the enrolled beneficiaries (Deloitte Development, 2016). Medicare uses the HCC risk-adjustment model to calculate payments and reimbursements based on relative risk scores of the beneficiary, compared to a regional reference population (Klugman, 2014). Higher payment is provided based on a higher calculated relative risk. It was encouraged that the practice accurately coded HCC information that depicted the patient’s level of complexity (Deloitte Development, 2016). Ensuring that HCC coding and documentation was accurate would capture the complexity of the patient and result in higher reimbursement (Bryan & Kontor, 2015). Due to the complexity of generating the HCC risk scores, the final risk score is available 16 to 18 months after the close of that year (CMMI, 2017). If the practice was to capture HCC data that demonstrated patient complexity, the effect on the ROI would occur starting in July 2018 for the CPC+ payment models (see Table 9). The desired effect would be higher HCC risk scores that reflected patient complexity, and in turn, a higher reimbursement through the CMF.
CPT Billing Only

The ROI analysis for the CPT billing yielded the lowest ROI among the three payment models. The practice could expect to see a return of $0.44 for every dollar invested. The results of this analysis were less conservative in estimating the numerator revenue. The actual ROI for this payment model is expected to be lower, due to limits on case manager productivity, denied claims, and patient participation attrition rates.

During the analysis of case management productivity for quarter two 2016, it was found that actual productivity was lower than the standard of ten contacts per day. The exemplar model case manager conducted an average of eight contacts per day, which represented the highest productivity level among the case managers. The analysis utilized this case manager as the exemplar model, based on her greater experience as a case manager and good working relationship with the practice team. Therefore, not all case managers will perform to such a degree. Productivity will be influenced by these factors, as well as case manager turnover. As these factors decrease productivity, the ROI would drop.

On the other hand, if case management productivity increased to 10 patient contacts per day, the ROI would increase to $0.67 for every dollar spent. This would further increase to $0.96 per dollar spent, if patient contacts increased to 15 contacts per day. The increase in

<table>
<thead>
<tr>
<th>Months</th>
<th>Risk Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2017- June 2017</td>
<td>CY 2015</td>
</tr>
<tr>
<td>July 2017- June 2018</td>
<td>CY 2016</td>
</tr>
<tr>
<td>July 2018- June 2019</td>
<td>CY 2017</td>
</tr>
<tr>
<td>July 2019- June 2020</td>
<td>CY 2018</td>
</tr>
<tr>
<td>July 2020- June 2021</td>
<td>CY 2019</td>
</tr>
<tr>
<td>July 2021- December 2021</td>
<td>CY 2020</td>
</tr>
</tbody>
</table>
productivity should not result in an increase in costs. For example, if the case manager could conduct two face-to-face visits per day of thirty minutes each in the practice office, and eight telephone contacts of ten minutes each, that total time would result in 140 minutes of billable services each day. Assuming seven hours of productivity per eight-hour work day, the case manager would still have 420 minutes to document or conduct more patient contacts during that work day (Appendix H).

Another factor that could not be estimated in this analysis, was the number of denied billable claims. CCM services were not billable under Medicare in the years leading up to 2017 for the organization’s CCM program. Therefore, an estimate of the number of denied claims could not be made. Under the Medicare physician FFS for 2017, CCM services cannot be billed in the same month as services for transitions of care (CPT 99495 or 99496), home health (HCPCS G0181), hospice care supervision (HCPCS G0182), or end stage renal disease services (CPT 90951-90970) (PYA, 2015). However, the Medicare payment for these codes have higher relative value units and payment than CCM CPT codes. Therefore, the effect of denied claims may have little impact on the practice as a whole, but would decrease the ROI exclusively for CCM services.

Participation attrition is the final factor that would potentially lower the ROI estimation in this analysis. The CPT codes for CCM services are subject to the same deductibles and copayments as all Medicare part B outpatient services (Medicare.gov, 2017). Therefore, the beneficiary would be responsible for 20% of the total billable CCM services each month. This amount could range from approximately $8 for CPT 99490, to over $27 for complex patients requiring over 90 minutes of CCM services. During the MiPCT demonstration, Medicare beneficiaries were not required to pay copayments on services. It is unknown how the required
copayment will affect future enrollment (Basu, Phillips, Bitton, Song, & Landon, 2015). Under the 2017 payment model, patients may be unwilling to participate in CCM services when required to pay 20% of the total billed services provided. One could expect some participation attrition due to this factor for patients with Medicare part B only. For patients with supplemental insurance, the 20% copayment would be covered by billing the secondary insurance. Overall, the projected ROI results for CPT billing represent a liberal estimation of the true ROI.

**Project Deliverables**

An evaluation of the scholarly project objectives occurs by assessing the completion of the project’s deliverables (Moran, Burson, & Conrad, 2014). The results of this scholarly project produced four deliverables: (a) the ROI predicted results; (b) interpretation of the ROI results; (c) a Microsoft Excel spreadsheet for future ROI calculation; and (d) ROI analysis process steps. The results of the predicted ROI analysis for 2017 were presented to the organization’s key stakeholders. The Microsoft Excel spreadsheet for ROI calculation was provided to the organization. This template would allow the tracking of CPC+ reimbursement funds, costs, and ROI. The step-by-step process of calculating the ROI at the end of 2017 and for future years was developed. The template and process instructions included the ability to predict future ROI for the program with the collection of high-quality data in the upcoming years. This will occur in 2018 with the completion of three years of high-quality data to serve as the three necessary data points to trend future predictions. Finally, the factors that could increase or decrease reimbursement pertinent to the ROI were identified and discussed.

**Stakeholder Support**

Successful initiatives must ensure effective communication to stakeholders (Caldwell et al., 2009). The key stakeholders for this project included the three practices within the PHO with
CPC+ designation, the PHO, and Medicare. Under CPC+, payment was distributed directly to the provider practice. This ROI analysis provided the practice with the information needed to estimate the ROI for CCM at the practice level.

The PHO was also a key stakeholder. The PHO was responsible for the ongoing operation of the CCM program and evaluation of quality indicators for each practice. As a member of an ACO, the PHO was required to provide proof of cost-effective care. The CCM program was one means to deliver on that mission and a ROI could provide data regarding the program’s effectiveness.

Medicare was also a key stakeholder. If CCM programs are successful at decreasing acute care utilization, there can be substantial savings for Medicare. Successful CCM programs have demonstrated a significant decrease in Medicare spending and provided a positive ROI for Medicare. As part of CPC+, practices were required to forecast their spending of the CMF. Following this DNP project, at the end of the reporting 2017 year, the practice would be expected to provide an account of the actual care management revenue and expenditures (CMS, 2016b). The ROI template created through the completion of the project would provide a means to assess and report future and past CCM costs and revenue. The goals of reporting are to “help practices understand how to optimize their use of CCM and to help CMS understand how practices use the revenue to perform services” (CMS, 2016b, p. 7). If more practices were able to sustain CCM programs, then wider adoption of such services could occur, resulting in a further reduction in healthcare spending for Medicare.

**Implications for Practice**

The completed scholarly project resulted from strengths and successes that fostered its completion. There were also difficulties discovered that resulted in weaknesses in the project’s
implementation. However, there are numerous implications of this analysis at the practice level, community level, and for sustainability of the CCM program. This section will discuss the strengths and difficulties, but also discuss the overall limitations to the completed ROI analysis and how the results compare to evidence and healthcare trends. Finally, a reflection concerning the enactment of the DNP Essentials, as outlined by the American Association of Colleges of Nursing’s, *The Essentials of Doctoral Education for Advanced Nursing Practice* (2006) through the implementation and completion of this scholarly project, is discussed.

**Strengths and Successes**

The success of this scholarly project occurred largely as a result of the strengths of the organization’s staff. The exemplar case manager was very open to shadowing by the DNP student during her working hours, and open to questions and critiques regarding the delivery of patient care. The PHO’s quality team was eager to assist with the cost analysis and assisted with the gathering of high-quality data metrics. A driving factor in the success was the PHO’s data analyst. The interdisciplinary collaboration and expertise of this individual provided a strength to the rigor and completion of the analysis. The data analyst also provided expertise in Microsoft Excel template designs in order to analyze data.

The most significant factor in the project’s success was the knowledge of the site mentor who was available during the project’s planning and data collection. As the manager of the CCM program, this site mentor was eager and willing to assist in the project’s implementation. The site mentor had a unique background as a nurse with a master’s degree in business administration. With this knowledge, she provided key insight to Medicare reimbursement and evaluation of factors influencing the ROI analysis.
Weakness and Difficulties

The most hindering weakness to the project was the inability to trend data to predict future ROI based on quality metrics. The difficulty in collecting high quality data in 2013 and 2014, prevented the possibility of utilizing a trend function for this analysis. The ability to trend data would have generated a predicted quality score based on a least squares simple linear regression.

Another weakness was the utilization of 2015 quality metric data, as opposed to 2016 data, which would have provided a timelier projection for a more accurate ROI analysis for the CPC+ not a member of an ACO model. This would have made the ROI predictions more sound, rather than utilizing quality data from two years ago.

A final difficulty encountered was the inability to predict the incentive payment from the ACO. This payment will vary depending on the total Medicare dollars saved by the ACO and the administration fees retained by the ACO for the 2017 year. If the total Medicare dollars saved by the ACO are less, or the retained administration fees are larger, the allocated distribution will be less, resulting in a decrease to the ROI for that payment model. In comparison, if the administration fees remain the same, and the ACO increases the total Medicare dollars saved, then the distributed payment to the practice would increase and would increase the predicted ROI.

Implications for the Organization

The CCM program that was operating at the time of this project represented a quality improvement initiative that was essential to the coordination of care for those living with MCCs. This scholarly project had numerous implications for the CCM program and the organization. The ROI analysis provided the organization with the ability to assess the value of the program
and inform future improvement actions (AHRQ, 2014d). The analysis provided the organization and its stakeholders with data concerning the financial impact of the program at the practice level. Quality improvement processes, such as the CCM program, are often budget-neutral (Health Resources and Services Administration [HRSA], 2011). This analysis demonstrated the ability of the CCM program to remain cost-neutral in alignment with the organization’s missions and values.

The project’s deliverables also provided the organization with the ROI template via Microsoft Excel. The template allowed for tracking of case management expenses and revenue, which was a reporting requirement as a member of CPC+. The template also provided the means for conducting ROI in the following years. The formulations for trended data were mapped for the organization within the template. With the collection of high quality data in 2016 and 2017, the organization could utilize the trend function to predict ROI for the remaining 2018 to 2021 years, which was the original intent of the project.

The completed analysis also provided the organization the ability to compare payment models as a member of an ACO, or not. It allowed the practice to make decisions based on membership in the ACO, and the effects of that membership on the ROI for CCM services. This ROI analysis demonstrated little effect on the ROI as a member of an ACO or not. The completed project provided the organization with the projected impact of the absence of continued external funding provided by participation of the organization in various initiatives. With this information, the organization could plan for strategies to sustain the program in the event of decreased funding, and provided necessary knowledge regarding the impact of funding CCM services through CPT billing only. The results provided the organization with proposals
for changes to the work processes in regards to case management productivity, that could enhance income following potential losses of external funding.

All the projected ROI estimations for CPT billing fall between zero and one. According to AHRQ, this is a negative investment for the practice because the return is too little to truly account for the investment (AHRQ, 2014d). Under this ROI category, the CCM program does not cost the organization money, but does not bring in sufficient revenue. The ability of the program to remain cost neutral was a key objective stated by the program’s stakeholders. With this ROI result, the overall impact of the CCM program on population health must be taken into consideration. CCM services improve care coordination for this complex patient population. Improved care coordination for this population is an objective of health system reform at all levels of care (Schang, Waibel, & Thomson, 2013).

Implications for the Community

The PHO was comprised of ambulatory primary care and specialty offices, as well as the local community hospital. The hospital constitutes a key stakeholder in the sustainability of the CCM program. As a member of the PHO, the goal of the hospital is to build standards of care and jointly share in risk sharing. CMS instituted the hospital readmissions reduction program in October 2012 (Hoffman & Cronin, 2015). Under this model, hospitals are penalized for excessive readmissions, defined as an admission within 30 days of discharge (Hoffman & Cronin, 2015). CCM services have been reported to reduce hospital readmission rates (Chow & Wong, 2014, Dorr et al., 2008; Hamar et al., 2010; Hamar et al., 2011, Joo, 2014, Schraeder et al., 2008). Therefore, the hospital may benefit from the continued sustainability of the CCM program, and its impact on readmission rates. Organizations that are committed to quality result in increased partnerships and funding opportunities (HRSA, 2011). As a result, the hospital
administration may represent a key partnership group and source of investment funding to continue the sustainability of the program.

**Recommendations Regarding Sustainability**

Successful implementation and ensured quality improvement requires frequent formal and informal assessment of effectiveness of the change (Caldwel et al., 2009). A ROI analysis is one method of assessing the effectiveness of quality improvement. The completed ROI analysis provided the organization with an assessment of the ROI for the CCM program within three payment models. A driving force for its sustainability will be the ability of the program to remain cost neutral, keeping aligned with the organization’s mission of cost-effective care. All the projected ROI analyses for 2017 demonstrated the program’s ability to meet this objective. The ongoing monitoring system for determining the program’s performance must be developed to sustain healthcare quality improvement programs (Kliger, 2014). The Microsoft Excel ROI template provided at the completion of this project provided the organization with the means to continue to assess the program’s performance in regards to the ROI at the practice level.

**Relation to Evidence and Healthcare Trends**

Studies that report on cost or ROI of CCM programs delivered to those with MCCs are rare (Duncan, 2008). According to CMSA, two thirds of organizations did not know the ROI of their CCM program (CMSA, 2015). The completed analysis provided knowledge of the ROI for CCM at the practice level. The ROI for CCM stated in the literature varies. In 2009 the Healthcare Intelligence Network conducted an electronic survey to understand the ROI for case management. Responses were provided by 187 healthcare organizations. Respondents of the survey indicated that 37% of the programs did not calculate a ROI; 25% reported ROI between
two and three; 12% reported ROI less than two; 9% reported between three and four; and only 7% reported ROI greater than four (Healthcare Intelligence Network, 2009).

The Stanford University School of Medicine conducted a microsimulation model to assess the financial return of CCM services by direct reimbursement of CPT billing under CPT 99490, only (Basu et al., 2015). The estimated nurse salary reported by Stanford was similar to that earned by case managers in this project organization. Basu et al. (2015) demonstrated that CCM services provided by a registered nurse could generate an estimated $6.33 PMPM. However, there were some flaws of this simulated model, compared to practice. The ROI results in their model were based on a case management panel of 386 patients per month. This is significantly higher than the national average caseload of 50 to 99 patients (Stricker, 2014). Overall, the practice would need to enroll 131 patients in order to break even on the cost of hiring a full time registered nurse (Basu et al., 2015). The model also only allowed for five minutes per patient, per encounter, for chart review and documentation (Basu et al., 2015). The time required to develop a comprehensive patient care plan and document each patient encounter is likely greater than five minutes.

Another study, mentioned previously, conducted by Holtrop, Luo, and Alexanders (2015) found that direct Medicare reimbursement from billable services was not sufficient to cover the costs of the CCM program. The allotted reimbursement from billable services was not provided in their analysis to compare to CPT billing payments in this project’s analysis. In their analysis, over a 16-month period, direct billing covered only 21% of the costs of the program (Holtrop et al., 2015). This is consistent with healthcare trends stating that the “ROI of keeping chronically ill patients out of the hospital under current payment models is often unfavorable” (Asch, Pauly, & Muller, 2016, p. 607). The results from this DNP project demonstrated that direct
reimbursement is enough to cover the costs of the CCM program for the exemplar practice, but does not result in appreciable revenue.

**Limitations**

During the implementation of a scholarly project, potential barriers may be identified (Moran, et al., 2014). Identification of these barriers allows for alterations in the project plan (Moran et al., 2014). As discussed previously, the amount of high quality data available to trend for predicting future scores was limited. The project plan was then adjusted to account for this barrier and resulted in the ROI analysis for 2017 only. Because the analysis was limited to one year, the ROI calculation did not consider issues of inflation, discounting, or depreciation (AHRQ, 2014d). In the future, as collection of high quality data continues, the prediction of the ROI based on trended results would need to account for these factors.

A limitation to predicting future ROI is the ever-changing Medicare reimbursement. The CPT billing payments are adjusted each year as part of the Medicare physician FFS final rule. Therefore, the ability to predict the allotted reimbursement rate for the FFS payment model in the future years is limited until the payment distribution is published.

**Generalizability to the CCM Program as a Whole**

The results of this scholarly project are applicable to the PHO’s CPC+ track one practices only. The ROI analyses for the three payment models cannot be generalized to federally qualified health centers (FQHCs) and rural health clinics (RHCs). FQHCs and RHCs are not eligible to participate in CPC+ (CMS, 2017). Starting January 2016, FQHCs and RHCs were eligible to bill for CPT 99490. However, these practices may bill for this additional service if not already captured in the RHC all-inclusive rate, or the FQHC prospective payment system for CCM services (CMS, 2015d). Due to the combination of these payment models, FQHCs and
RHCs are ineligible to bill for CPT 99487 and CPT 99489. The remaining practices within the PHO are FQHCs and RHCs. A separate ROI analysis based on the payment models for FQHCs and RHCs would be needed in order to conduct the ROI for the PHO CCM program as a whole.

This ROI analysis did not provide all the revenue surrounding CCM services; however, it did provide a comprehensive analysis of the Medicare portion of reimbursement and provided a framework for analysis of other payers. CMS agrees that “Medicare alone cannot provide adequate support for practices to make significant changes in care delivery” (CMS, 2016b, p.16). Patients within a practice have a variety of different insurers. Practices that will be successful within CPC+ will be those whose revenue is approximately 50% provided by the qualifying commercial payers and Medicare (CMS, 2016b). An analysis of the revenue generated by the SIM and commercial payers will be required to assess the ROI for the CCM program as a whole.

**Measuring CCM Services**

The ability to measure the success of the care management program is essential to both Medicare beneficiaries and stakeholders (AHRQ, 2014e). One such measurement is evaluating whether the program met its goals in regards to quality care and cost savings (AHRQ, 2014e). Measuring CCM and care coordination “is challenging precisely because it is the product of multiple organizations and providers” (Schang et al., 2013, p. 6). Outcome measures of population health, as indicated by eQCMs, are the main purposes of CCM programs; however, these measures are influenced by extraneous variables (AHRQ, 2014e).

It is difficult to isolate a CCM service’s impact on patient outcomes and reimbursement (CMSA, 2015). The ability of this analysis to represent the ROI exclusively for CCM services was limited. For example, GC CAHPS scores are anonymous and are provided by any member of the practice, not exclusively those receiving CCM services. The CPC+ quality measures are
reported at the practice level for all commercial, uninsured, Medicare, and Medicaid patients. The measures for payment reimbursement under CPC+ and as a member of an ACO are also not specific to CCM services. Therefore, other process and quality improvement initiatives also influence the quality metric scores, aside from CCM alone. Although this ROI analysis was conducted on CCM under Medicare payment models, a limitation of these payment models was reimbursement at the practice level and not specific to those receiving CCM services.

**Reflection on Enactment of DNP Essentials**

The AACN states that “doctoral education is designed to prepare nurses at the highest level of leadership in practice and scientific inquiry” (AACN, 2006, p.7). Graduates are prepared in foundational competencies that are essential to advanced practice roles. The DNP scholarly project is a demonstration of these eight Essential competencies (Moran et al., 2014). This project demonstrated achievement in these eight Essentials through the planning, implementation, and evaluation of the project (Moran et al., 2014).

**Essential I: Scientific Underpinnings for Practice**

The use of scientifically-based theories and concepts allows for the integration of nursing science and theories from other disciplines to be translated into practice. The foundation of CCM programs is the Wagner chronic care model (Appendix B) which describes the actions required to enhance healthcare delivery for those with MCCs, living in the community. The model and knowledge generated from successful CCM programs provided the evaluation of the organization’s CCM program at meeting these standards. In addition, the Donabedian model was utilized to define key concepts in driving factors of the organization’s change. The ROI analysis allowed for the evaluation of practice, based on an approach from the discipline of business.
**Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking**

This Essential prepares the DNP graduate to address care for a set of populations or the broad community (AACN, 2006). With competency in this Essential, the DNP prepared nurse is able to employ principles of business to implement effective initiatives to improve quality of care at the practice or system-wide level (AACN, 2006). Organizational leadership was demonstrated through a thorough assessment of the organization utilizing the Burke and Litwin Model. Leadership skills were demonstrated through continued communication with the organization’s key stakeholders.

The analysis of cost-effective practice is an aspect of this Essential. The completion of this scholarly project demonstrated competency in this Essential. The CCM program was evaluated at the practice and system-wide level. The budget for the implementation of the project was conducted. The principles of business were utilized to conduct the ROI within the three payment models. The final deliverables of the project demonstrated the cost-effectiveness of the CCM program through the completed ROI analysis. The interpretation of the ROI results allowed for the analysis of the program accounting for adjustments in reimbursement from the three Medicare payment models.

**Essential III: Clinical Scholarship and Evidence-Based Practice**

Essential III requires competence in translation of research into practice and evaluation of practice. Prior to the project’s implementation, an extensive search of the literature was conducted to identify characteristics of successful CCM programs and available ROI analyses for comparison. This Essential prepares the DNP graduate to evaluate outcomes of quality improvement methodologies (AACN, 2006). The activities of the student for this completed
scholarly project demonstrated competency in this Essential through the collection of appropriate and accurate data. The data were then analyzed at the practice level for accuracy, based on examination of patterns of outcomes. The final aspect of this competency is the dissemination of research to improve healthcare outcomes (AACN, 2006). The dissemination of the project’s outcomes is described in further detail below.

**Essential IV: Information Systems and Patient Care Technology for Improving Healthcare**

A DNP graduate must demonstrate proficiency in information systems (AACN, 2006). The project demonstrated competency in information systems through the project’s data extraction. During the project’s implementation phase, the student evaluated accuracy of the quality metric scores based on EHR capability. The timeliness of accurate and appropriate data was taken into consideration during the final project analysis. The student utilized technical skills and conceptual ability to develop an ROI template utilizing Microsoft Excel. The student also evaluated the limitations of the proposed statistical analysis based on the available data and adjusted the project plan accordingly to ensure an appropriate analysis.

**Essential V: Healthcare Policy and Advocacy**

Within this Essential, the DNP graduate is prepared to influence and implement healthcare policies (AACN, 2006). The project allowed for the appraisal of health policy surrounding CCM from the perspective of the practice. This included assessing the Medicare physician FFS final rule and interpreting the practice requirements and payments for inclusion into the ROI calculation.

**Essential VI: Interprofessional Collaboration**

A DNP prepared graduate is competent in facilitating interprofessional team development to address patient care needs (AACN, 2006). This scholarly project allowed the student to
develop intraprofessional leadership skills with the collaboration with case managers in the program. The student partnered with an interdisciplinary team that consisted of the quality improvement team with expertise in information technology, the organization’s data analyst, and the program’s manager with expertise in business administration. Input from all members of this interdisciplinary team were essential to the completion of the project. It allowed the student to be proficient in communicating with members of different professions on progress towards a common goal.

**Essential VII: Clinical Prevention and Improving Population Health**

With competency in this Essential, the DNP prepared graduate focuses on improving the health status of the population by health promotion and risk reduction for individuals and families (AACN, 2006). The completed project provided necessary information on a factor that influences the sustainability of the CCM program. The CCM program improves the health of the population in which the organization serves by: improving coordination of care; eliminating gaps in care; promoting self-management; and reducing healthcare utilization for those living with MCCs. The continued sustainability of this care delivery model is essential to aid in the health of this population. The completed project allowed for evaluation of this care delivery model from a financial perspective, which is important to its continued sustainability.

**Essential VIII: Advanced Nursing Practice**

The final DNP Essential states that practice competencies should be enacted in a variety of patient care settings and provide an understanding of complex patient care (AACN, 2009). The project allowed for utilization of systems thinking in a unique setting of the PHO. The goals of the project will promote improvement of patient outcomes by evaluating the financial sustainability of the CCM program. It allowed for the analysis of care delivery requirements
based on each payment model. The project allowed for the assessment of the links among organizations, policy issues, and fiscal payments.

**Dissemination of Outcomes**

The final step to the scholarly project is dissemination of results. Disseminating research and outcomes of projects can occur in a variety of forms, from written to verbal presentations (Moran et al., 2014). A dissemination of the project’s outcomes occurred on March 17th, 2017 in the form of a poster presentation to fellow nurse practitioners at an annual nurse practitioner conference. The project was also disseminated orally to fellow DNP students on March 31, 2017. Dissemination is critical to communicate measurement strategies of the program’s value to the key stakeholders (AHRQ, 2014e). The results of the ROI analysis and the project’s deliverables were shared with the program’s manager through electronic report and face-to-face presentation. A copy of the Microsoft Excel ROI template and process steps was distributed to the organization for future ROI evaluations (Appendix I). This template was also distributed to other CPC+ practices affiliated with the organization, for reference. The outcomes of the project were disseminated orally on April 20th 2016 at the university to the project’s advisory team and other faculty members. Submission of a final report of the completed project to Scholar Works, also provided a means of dissemination through a written record of its implementation and outcomes.

**Conclusions**

The completed DNP scholarly project was the calculation of a ROI analysis of CCM services under three different Medicare payment models for a PHO in northwestern lower Michigan. The objectives included: (a) completion of the ROI analysis, and (b) interpretation of the ROI results. The project’s outcomes allowed for confidence in the program’s ability to
remain cost-neutral in accordance with the organization’s mission and vision of providing cost-effective care. The results allowed for comparison of the reimbursement models under three different Medicare payments. This ROI analysis represents a limited number of ROI analyses for CCM at the practice level. The completed ROI analysis based on direct Medicare reimbursement for CPT billing demonstrated that the CMS allotted payments were likely insufficient to sustain the ongoing operation of this CCM program. Primary care practices have stated that inadequate reimbursement and confusing payment models are barriers to CCM success. This analysis demonstrated direct that Medicare reimbursement through CPT billing still remains a barrier to CCM sustainability, due to inadequate reimbursement.

There were several barriers and limitations discovered during the implementation of the project. The inability to trend data for future projections resulted in a change in the ROI design. The ROI analysis was specific to CPC+ practices, and those with the ability to bill for all CPT CCM codes, and was not generalizable to FQHCs or RHCs. However, for the organization this analysis provided the needed evaluation of the cost-effectiveness of the current CCM program and provided confidence in its sustainability. The CCM program greatly impacted the care coordination and care delivery to those in the community living with MCCs. It represented an avenue of care delivery that promoted health promotion and the prevention of illness, by enacting the principles of Wagner’s chronic care model to improve the health of the community. During the enactment of this project, the DNP-prepared student developed competencies in all of the DNP Essentials. It is hopeful that this analysis will serve as a guide for further analyses of the ROI for CCM services at the practice level. It is with this continued knowledge that improvements to CCM reimbursement can be made to ensure the sustainability of these
programs and continued improvement of coordination of care and health for those living with MCCs.
References


Appendix A

A Causal Model of Organizational Performance and Change

Title: A Causal Model of Organizational Performance and Change
Author: W. Warner Burke, George H. Litwin
Publication: Journal of Management
Publisher: SAGE Publications
Date: 09/01/1992
Copyright © 1992. © SAGE Publications

Gratis Reuse

Permission is granted at no cost for use of content in a Master's Thesis and/or Doctoral Dissertation. If you intend to distribute or sell your Master's Thesis/Doctoral Dissertation to the general public through print or website publication, please return to the previous page and select 'Republish in a Book/Journal' or 'Post on Intranet/password-protected website' to complete your request.
Appendix B

Wagner’s Chronic Care Model

Diagram was reproduced with permission.

“Copyright 1996-2016 The MacCall Center. The Improving Chronic Illness Care Program is supported by The Robert Wood Johnson Foundation, with direction and technical assistance provided by Group Health’s MacColl Center for Health Care Innovation.”

Retrieved from:

http://www.improvingchroniccare.org/index.php?p=Chronic+Care+Model&s=124
American College of Physicians LICENSE
TERMS AND CONDITIONS

Apr 27, 2017

This is a License Agreement between Megan Madole ("You") and American College of Physicians ("American College of Physicians") provided by Copyright Clearance Center ("CCC"). The license consists of your order details, the terms and conditions provided by American College of Physicians, and the payment terms and conditions.

All payments must be made in full to CCC. For payment instructions, please see information listed at the bottom of this form.

License Number 4043650120195
License date Jan 06, 2017
Licensed content publisher American College of Physicians
Licensed content title Effective clinical practice : ECP
Licensed content date Jan 1, 1998
Type of Use Thesis/Dissertation
Requestor type Academic institution
Format Print, Electronic
Portion image/photo
Number of images/photos requested 1
Title or numeric reference of the portion(s) Chronic Care Model figure/image
Title of the article or chapter the portion is from Chronic disease management: what will it take to improve care for chronic illness?
Editor of portion(s) N/A
Author of portion(s) Wagner, E. H
Volume of serial or monograph 1
Issue, if republicing an article from a serial 1
Page range of the portion 2
Publication date of portion 1998
Rights for Main product and other compilations/derivative products
Duration of use Current edition and up to 15 years
Creation of copies for the disabled no
With minor editing privileges no
For distribution to Worldwide
In the following language(s) Original language of publication
With incidental promotional use no
The lifetime unit quantity of Up to 499

https://is130.copyright.com/ContentAdmin/PLF.jsp?ref=d08d74e5-29e4-4ced-a8f7-9ed3b305e01f3

1/2
new product
Made available in the following markets
The requesting person/organization is: Megan Madole
Order reference number
Author/Editor
The standard identifier of New Work
Title of New Work
Publisher of New Work
Expected publication date
Estimated size (pages)
Total (may include CCC user fees)
Terms and Conditions

Return on Investment Comparison of Three Payment Models for Chronic Care Management in a Northwestern Physician Hospital Organization
Scholar Works
May 2017
80
0.00 USD
Appendix C
Strengths, Weakness, Opportunities, and Threats of the Current CCM Program

<table>
<thead>
<tr>
<th>Internal Strengths</th>
<th>Internal Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Low turnover rate of case management staff.</td>
<td>• Lacks an information system that allows all case managers to chart on.</td>
</tr>
<tr>
<td>• All case managers are hybrid case managers and registered nurses.</td>
<td>• Providing case management services for those not involved in the MiPCT program resulting in no reimbursement.</td>
</tr>
<tr>
<td>• Very high functioning RNs in their roles that possess critical thinking skills, communication skills, and ability to monitor own work flow and stay on task.</td>
<td>• Time spent with clients is logged in ranges of time, not exact. Causes an issue when evaluating productivity and return on investment.</td>
</tr>
<tr>
<td>• One manager for all case managers within the organization. Case managers are employed by the PHO not individual offices/clinics.</td>
<td>• Not achieving productivity goals.</td>
</tr>
<tr>
<td>• Case managers are embedded in physician practices.</td>
<td>• No standardized risk assessment tool or work processes in place.</td>
</tr>
<tr>
<td>• High volume of referred patients</td>
<td>• Outsourcing of all billing can increase costs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External Opportunities</th>
<th>External Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Priority health provides a per member per month allocation.</td>
<td>• New CMS CPT code 99490 which will provide reimbursement only for those being case managed for minimum 20 minutes.</td>
</tr>
<tr>
<td>• State Innovation Model will be an extension of MiPCT demonstration until January 2019.</td>
<td>• Reimbursement can change as initiative requirements change.</td>
</tr>
<tr>
<td>• Blue Cross Blue Shield provides uplift incentives in reimbursement.</td>
<td>• CPC+ payment is reimbursed to the practice.</td>
</tr>
<tr>
<td>• Few competitors that are providing same service to patients.</td>
<td></td>
</tr>
<tr>
<td>• As population ages, the number of patients that will meet criteria for case management likely to increase.</td>
<td></td>
</tr>
<tr>
<td>• Additional CPT codes for complex patients requiring greater than 60 minutes per month.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D

CPC+ Track one Reconciled Payment Methodology

**Q** Did your practice report on all 9 eCQMs and receive a CAHPS score?

- **No**
  - You are not eligible to retain your PBIP (Quality or Utilization).
- **Yes**
  - Did your practice meet the 50th percentile on all 9 eCQMs and the 30th percentile on CAHPS?
    - **No**
      - You are not eligible to retain the Utilization Component.
    - **Yes**
      - Did your practice meet the 80th percentile on at least 6 out of the 10?
        - **No**
          - The percent of the Quality Component you will retain is the combined dollar amount based on individual performance for each measure that meets or exceeds the 50th percentile for eCQMs and the 30th percentile for CAHPS.
        - **Yes**
          - The percent of the Quality Component you retain is 100% of the Quality Component. The percent of the Utilization Component you retain is the combined dollar amount based on the individual performance for each of the two utilization measures.
Appendix E

CPC+ Electronic Clinical Quality Metric Requirements

<table>
<thead>
<tr>
<th>CMS ID#</th>
<th>NQF#</th>
<th>Measure Title</th>
<th>Measure Type/Data Source</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS159v5</td>
<td>0710</td>
<td>Depression Remission at Twelve Months</td>
<td>Outcome/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
<tr>
<td>CMS165v5</td>
<td>0018</td>
<td>Controlling High Blood Pressure</td>
<td>Outcome/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
<tr>
<td>CMS122v5</td>
<td>0059</td>
<td>Diabetes: Hemoglobin A1c (HbA1c) Poor Control (&gt; 9%)</td>
<td>Outcome/eCQM</td>
<td>Population/Public Health</td>
</tr>
<tr>
<td>CMS166v5</td>
<td>0022</td>
<td>Use of High-Risk Medications in the Elderly</td>
<td>Process/eCQM</td>
<td>Patient Safety</td>
</tr>
<tr>
<td>CMS149v5</td>
<td>N/A</td>
<td>Dementia: Cognitive Assessment</td>
<td>Process/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
<tr>
<td>CMS139v5</td>
<td>0101</td>
<td>Falls: Screening for Future Fall Risk</td>
<td>Process/eCQM</td>
<td>Patient Safety</td>
</tr>
<tr>
<td>CMS137v5</td>
<td>0004</td>
<td>Initiation and Engagement of Alcohol and Other Drug Dependence Treatment</td>
<td>Process/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
<tr>
<td>CMS50v5</td>
<td>N/A</td>
<td>Closing the Referral Loop: Receipt of Specialist Report</td>
<td>Process/eCQM</td>
<td>Care Coordination</td>
</tr>
<tr>
<td>CMS124v5</td>
<td>0032</td>
<td>Cervical Cancer Screening</td>
<td>Process/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
<tr>
<td>CMS130v5</td>
<td>0034</td>
<td>Colorectal Cancer Screening</td>
<td>Process/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
<tr>
<td>CMS131v5</td>
<td>0055</td>
<td>Diabetes: Eye Exam</td>
<td>Process/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
<tr>
<td>CMS138v5</td>
<td>0028</td>
<td>Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention</td>
<td>Process/eCQM</td>
<td>Population/Public Health</td>
</tr>
<tr>
<td>CMS166v5</td>
<td>0052</td>
<td>Use of Imaging Studies for Low Back Pain</td>
<td>Process/eCQM</td>
<td>Efficient Use of Healthcare Resources</td>
</tr>
<tr>
<td>CMS125v5</td>
<td>2372</td>
<td>Breast Cancer Screening</td>
<td>Process/eCQM</td>
<td>Clinical Process/Effectiveness</td>
</tr>
</tbody>
</table>

(CMS, 2016e)
Appendix F

Grand Valley State University Human Research Review Committee Determination

DATE: February 23, 2017

TO: Megan Madole
FROM: Grand Valley State University Human Research Review Committee
STUDY TITLE: [1028791-1] A Return on Investment Comparison of Three Payment Models for Chronic Care Management under Medicare in a Northwestern Physician Hospital Organization
REFERENCE #: 17-162-H
SUBMISSION TYPE: New Project
ACTION: Acknowledged - Not Research
EFFECTIVE DATE: February 23, 2017
REVIEW TYPE: Administrative

Thank you for your submission of materials for your planned research study. It has been determined that this project:

DOES NOT meet the definition of covered human subjects research as per current federal regulations, as it not designed to develop or contribute to generalizable knowledge. The project, therefore, DOES NOT require further review and approval by the HRRC.

If you have any questions, please contact the Office of Research Integrity and Compliance at (616) 331-3197 or ric@gvsu.edu. Please include your study title and reference number in all correspondence with our office.
Appendix G

Implementation Timeline

- **January**
  - Perform literature review

- **February**
  - Presented DNP proposal in oral and written form - Feb 8, 2017
  - Submitted IRB approval
  - IRB Determination - Feb 23, 2017
  - Gathered denominator and numerator data

- **March**
  - Conducted ROI analysis
  - Present results to organization leadership

- **April**
  - Disseminate findings via oral project defense
  - Submit final DNP project to Scholar Works
## Projected Productivity Models for CCM: Effect on Revenue

<table>
<thead>
<tr>
<th></th>
<th>One Clinic Day</th>
<th>Annual Revenue *</th>
<th>Monthly Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Face to Face</td>
<td>Face to Face Time</td>
<td>Revenue 99490</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min</td>
<td>Phone Contacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phone Time</td>
<td>Revenue 99490</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total # of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Revenue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99490 and 99487</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>only</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>60</td>
<td>$92.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>$168.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>$261.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$58,053.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4837.77</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>90</td>
<td>$138.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>$253.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>$392.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$87,079.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7256.62</td>
</tr>
</tbody>
</table>

* Assumes 5 days per week and 44.4 working weeks per year to calculate annual FFS revenue

- On average the ratio of face-to-face contacts to phone contacts=1:4
- Average face-to-face contact time= 30 minutes
- Average phone contact time= 10 minutes

### Projections Based on Model

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th>Model B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Revenue from 99490/99487</td>
<td>$58,053.00</td>
<td>$87,079.50</td>
</tr>
<tr>
<td><strong>Additional 99489 Revenue</strong></td>
<td>$7,086.74</td>
<td>$7,086.74</td>
</tr>
<tr>
<td>▲ GPPP7 Revenue</td>
<td>$1,785.59</td>
<td>$1,785.59</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$66,925.33</td>
<td>$95,951.83</td>
</tr>
<tr>
<td>1.0 FTE</td>
<td>$107,080.53</td>
<td>$153,522.93</td>
</tr>
<tr>
<td>1.6 FTE</td>
<td>$6.36</td>
<td>$9.13</td>
</tr>
</tbody>
</table>
### Chronic Care Management Ongoing Operation Expenses

<table>
<thead>
<tr>
<th>Case Manager Costs</th>
<th>Rationale/Logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
</tr>
<tr>
<td>Salary</td>
<td>72862.40</td>
</tr>
<tr>
<td>Payroll Taxes &amp; Insurance</td>
<td>17486.98</td>
</tr>
<tr>
<td>For 1.0 FTE</td>
<td>90349.38</td>
</tr>
<tr>
<td>For 1.6 FTE</td>
<td>144559.00</td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td></td>
</tr>
<tr>
<td>Phone One Time Fee</td>
<td>99.00</td>
</tr>
<tr>
<td>Phone Annual Cost</td>
<td>456.00</td>
</tr>
<tr>
<td>Computer (HP Zbook)</td>
<td>1297.17</td>
</tr>
<tr>
<td>Computer Monitor (Samsung LCD 22&quot;)</td>
<td>160.00</td>
</tr>
<tr>
<td>Wireless Headset</td>
<td>298.00</td>
</tr>
<tr>
<td>Wireless Keyboard/Mouse</td>
<td>43.20</td>
</tr>
<tr>
<td><strong>Training</strong></td>
<td></td>
</tr>
<tr>
<td>Training Expense Annual</td>
<td>500.00</td>
</tr>
<tr>
<td><strong>CCM Travel</strong></td>
<td></td>
</tr>
<tr>
<td>Annual Travel Expense</td>
<td>1200.00</td>
</tr>
<tr>
<td>Total Equipment Costs</td>
<td>4053.47</td>
</tr>
<tr>
<td>For both Case Managers</td>
<td>8106.94</td>
</tr>
</tbody>
</table>

**Population Health Database**

| Interfaces | 1149,473,644 |
| Provider Addition | 6250 |
| **Total for 1.0 FTE** | $181,802.32 |

**Total Case Management Cost for Practice**

| $160,065.42 |

**PMPM**

| $9.51 |
## Total Attributed Beneficiaries

### Case Management Fee

<table>
<thead>
<tr>
<th>Region Risk Score</th>
<th>FMAP</th>
<th>Monthly Total</th>
<th>Annual Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>$120.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Tier 2</td>
<td>$72.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Tier 3</td>
<td>$48.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Tier 4</td>
<td>$30.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

### Performance Based Incentive Payment

<table>
<thead>
<tr>
<th>Domain</th>
<th>CMS Benchmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Monthly Total</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Electronic Clinical Quality Measures

<table>
<thead>
<tr>
<th>Performance Score</th>
<th>Percentile</th>
<th>Percentile</th>
<th>Percent Retained</th>
<th>Monthly Total</th>
<th>Annual Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Utilization Incentive

<table>
<thead>
<tr>
<th>Domain</th>
<th>CMS Benchmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Monthly Total</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Total Attributed Beneficiaries

### Total Percentage retained

<table>
<thead>
<tr>
<th>Total Percentage retained</th>
<th>Monthly Total</th>
<th>Annual Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

## Rationale

- Most report on all 9 measures.
- Most need 50% (50%) to be eligible for utilization incentive (if not retain 60% quality percentages).
- Most retain 80% on 5/10 then practice retains all of quality component (for all 10), and percentage of utilization did not meet 50% on 6/10 then retain percentages for each quality and utilization incentive.

---

## CPC+ Track One Only: Revenue

### Total Monthly Revenue

| Total Monthly Revenue | $0.00 |

### Total Annual Revenue

| Total Annual Revenue | $0.00 |
### CPC+ within an ACO

**Total Attributed Beneficiaries**

<table>
<thead>
<tr>
<th>Tier</th>
<th>Region Risk Score</th>
<th>PMPM</th>
<th>Attributed Members</th>
<th>Monthly Total</th>
<th>Annual Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>0.117-0.500</td>
<td>$6.00</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Tier 2</td>
<td>0.504-0.781</td>
<td>$8.00</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Tier 3</td>
<td>0.782-1.298</td>
<td>$16.00</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Tier 4</td>
<td>1.299-12.716</td>
<td>$30.00</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

**Minimum Savings Rate ACO**

<table>
<thead>
<tr>
<th></th>
<th>Annual Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met MSR</td>
<td>$0.00 PMPM</td>
</tr>
<tr>
<td>No MSR</td>
<td>$0.00 PMPM</td>
</tr>
</tbody>
</table>

### CPT Revenue

**Members Consenting to Services:**

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>CPT Revenue</th>
<th>Number of Claims Billed</th>
<th>Total Monthly</th>
<th>Total Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>99490</td>
<td>$42.21</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>99487</td>
<td>$92.66</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>99489</td>
<td>$46.87</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>G9997</td>
<td>$63.65</td>
<td></td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

**Total Amount of Claims Denied**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CPT Revenue</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

### ROI TOTALS

**Case Management Annual Cost:**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CPC+ only</th>
<th>CPC+ with ACO met MSR</th>
<th>CPC+ with ACO didn't meet MSR</th>
<th>CPT Billing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>