

Return on Investment of a Centralized Telephonic Case Management Program in a Commercial Population

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Case management has been effective in improving cost and quality outcomes for at-risk populations. The majority of case management studies have been performed on older Medicare populations and lacked standard financial outcome estimates. A telephonic case management program's clinical and economic effectiveness was assessed on a commercial population, including return on investment (ROI). The centralized program resulted in statistically significant lower emergency department visits and inpatient admissions with a significant ROI.

As the United States continues to deal with rising healthcare costs, healthcare systems are increasing the amount of risk they are taking in managing patient populations (Speed & Stempniewicz, 2019). Healthcare systems are focusing on managing individuals with chronic illness to improve patients' overall health and meet the cost and quality goals of risk contracts. Sixty percent of adults have at least one chronic condition; 40% have two or more chronic illnesses (Buttorff et al., 2017).

Although there is increasing focus on managing chronic illness, management of these conditions is inadequate. Only 50.9% of individuals with diabetes have glycated hemoglobin (HbA1C) less than 7%, which has not changed substantially over the last decade (Carls et al., 2017). Only 54% of individuals with hypertension have their condition under control (Merai et al., 2016). Chronic illnesses account for 90% of the nation's \$3.5 trillion in annual healthcare expenditures (Centers for Medicare & Medicaid Services, 2017; Skinner et al., 2016). There is a need to implement large, scalable solutions that coordinate care for patients with demonstrable clinical and financial outcomes.

This article is the third in a series supporting nurses to understand the importance of care coordination and transition management (CCTM)

in health care focused on value. Further, this series aims to support nurses in crafting business cases that create positive return on investment (ROI) arguments to leverage nurses in CCTM and other roles within the continuum (Brown et al., 2020; Start et al., 2020).

Care management or care coordination programs are often used to improve quality of care and reduce overall costs for the entire population under risk (Peck et al., 2018). Care management or care coordination can differ in scope, definition, and resources (Ahmed, 2016). Variables for success include identifying individuals at risk for increased costs and gaps in quality care, assessing current clinical risk, coordinating care across the continuum, and having programs in place to avoid unnecessary hospitalizations and emergency department (ED) visits. Examples include on-site or telephonic case management, telephonic disease management, home visitation, and print and digital health education campaigns. Programs should be sustainable, scalable, and demonstrate a ROI (Hong et al., 2014).

Research has shown positive results for care management on both utilization and quality outcomes. These include condition-specific programs for diabetes or pain management (Joo & Liu, 2017; Schechter et al., 2012; Seidl et al., 2017;

Smith et al., 2017) and transitional care programs post discharge (Melton et al., 2012). Outcomes of interest include reductions in ED visits, hospitalizations, readmissions, chronic disease control, and improvements in quality-of-life measures.

Many earlier studies were completed on an older or Medicare patient population. There remains a need to examine care management strategies for commercial populations and determine the clinical and financial outcomes. Also, the costs to administer these programs should be evaluated to determine the ROI and allow for programs to more easily scale across the healthcare system.

Methods

An extensive integrated healthcare system in the Midwest deployed a comprehensive ambulatory care management program that manages both Medicare and commercial members through risk contracts with payers or direct contracts with employers. A centralized telephonic team of registered nurse case managers used an interprofessional approach by assisting members in avoiding unnecessary hospitalizations and ED visits. Rather than disease-specific care management interventions, the organization identified at-risk individuals and nurses managed them holistically based on patient goals and needs. Nurses would receive daily lists of members who were at risk for either hospitalization or ED usage. Nurses called patients and performed evidence-based assessment, goal setting, health education, coordination among the care team, medication management, and support for social determinants of health.

This telephonic strategy was fully scaled to cover the entire healthcare system and had centralized supervision at the system level. Some standardized policies and procedures included productivity goals (number of calls, number of calls that connect with the patient), standardized work lists, outcome standards, and audit protocols, including random chart and recorded call reviews. The nursing staff had access to full medical records and other disciplines for referral, such as social work, pharmacy, and behavioral health.

The goals of the analysis described in this article were to determine care management program outcomes on a commercial insurance population, program costs, and ROI compared to not providing additional care management services. Claims and electronic health record (EHR) data were analyzed from one managed commercial risk contract. Members identified as at risk of either ED use or hospitalization and received at least one connected telephone call from the centralized care coordination team during March-May 2018 were included in the intervention group.

A matched control group was identified and included members who did not receive care coordination services. They were matched on their risk score using claims and EHR data and the number of ED visits and inpatient visits from January-March 2018. This was defined as the pre-intervention period.

The final analysis was to compare the number of ED visits and inpatient admissions between the two groups from the post-intervention period July-December 2018 using a one-way ANOVA to determine if the intervention had any impact on the number of ED visits and inpatient admissions.

Claims were analyzed to determine the average amount for both a commercial ED visit and an inpatient hospitalization. ED visits averaged \$2,191 and inpatient admissions averaged \$22,000. The per member per month (PMPM) financial impact of the difference in ED visits and inpatient hospitalizations were estimated and annualized to understand a full 12-month financial impact using the total population of 23,390 members. Total membership was calculated by averaging the number of members per month across the full 12 months. ROI was calculated by comparing the avoided healthcare costs with program costs.

Results

The centralized telephonic care management program significantly impacted ED visits and inpatient admissions compared to the control group and resulted in substantial savings. Financial savings were substantially more than the cost of the program, resulting in a positive ROI.

A total 335 individuals were identified as at risk for ED utilization and had at least one connected

Table 1.
Total Costs of Centralized Telephonic Care Management Program

	Clinical Staff	Administrative Staff	IT and Informatics	Total
Total Costs	\$261,032	\$33,681	\$84,204	\$378,917
PMPM Costs	\$0.93 PMPM	\$0.12 PMPM	\$0.30 PMPM	\$1.35 PMPM

IT = information technology, PMPM = per member per month

telephone call from the centralized telephonic care coordination team from March-May 2018. When comparing the impact of the centralized telephonic care management team in the post-intervention period, the group that received a telephone call had 127 ED visits; the matched control group had 235 visits. This was statistically significant ($p < 0.0001$). There were 108 fewer ED visits in the 6 months of the post-intervention period. If these were annualized, there would be 432 fewer ED visits with the intervention than without in this commercial population. Using the average cost for an ED visit of \$2,191 would result in \$946,512 in avoided costs or \$3.37 PMPM.

A total 103 individuals were identified as at risk for inpatient admission and had at least one connected telephone call from the centralized telephonic care coordination team from March-May 2018. When comparing the 6-month post-intervention period, the intervention group had 15 inpatient hospitalizations while the matched control group had 31 hospitalizations. This was statistically significant ($p < 0.05$). There were 16 less inpatient hospitalizations in the 6 months of the post-intervention period. If these were annualized, there would be 64 less hospitalizations using the telephonic care manager than without in this commercial population. Using the average cost of hospitalization of \$22,000 would result in \$1,408,000 in avoided costs or \$5.02 PMPM. Combining the savings from both avoided ED visits and inpatient admissions resulted in \$2,354,512 or \$8.39 PMPM in avoided costs.

Program costs to manage this commercial population for 1 year was \$378,917 or \$1.35 PMPM. The program's costs by personnel and expenses, including clinical, administrative, and information technology (IT) or informatics, is shown in Table 1. Clinical staff included in the cost

analysis were nursing, social work, behavioral health, and pharmacy staff who directly interacted with patients in the centralized care coordination program. Administrative staff included clinical supervisory staff up to the vice president and a part-time medical director. The IT and informatics group had staff in both the population health and IT departments responsible for importing and analyzing data and providing standardized reporting to clinical staff for outreach and evaluation. Comparing program costs with the savings generated from reduced ED visits and inpatient admissions, an ROI of \$6.20 saved for every \$1.00 invested was realized.

Discussion and Conclusions

As healthcare systems take on more risk for commercial populations, they should consider a centralized telephonic approach to care management to reduce ED visits and inpatient admissions. There were significant cost savings for this population health management strategy resulting in an \$8.39 PMPM reduction in costs in a commercial population with statistically significant differences in inpatient and ED utilization compared to a matched control. This was more than six times the cost of the program for a commercial population.

Cost savings were measured for the risk-bearing entity and could apply to an employer, payer, or healthcare system if they are in a full risk, capitated contract. Healthcare systems should look more holistically at the terms of the risk-bearing agreement. If they do not hold a contract with full capitation, then cost savings are split between the health system and the other risk-bearing entity. When allocating finite resources such as nurse care coordination, the type of risk arrangement cannot

be ignored when evaluating ROI. If telephonic care managers reduce inpatient hospitalizations and ED visits, the healthcare system will receive some bonuses and split the cost savings with the other risk-bearing entity. However, the healthcare system will lose revenue from those reductions, which should be accounted for when evaluating the program's financial success.

The centralized telephonic program is one of several at the organization that tailors its interventions to risk level. Future research could examine individual interventions and population health interventions as a systemic approach to managing populations' risk. This healthcare system used registered nursing staff as its primary care clinical staff in care coordination. Other health systems have used community health workers or unlicensed personnel to manage low-to-moderate risk individuals with different ROIs (Rush, 2012; Seidl et al., 2017). Future research could compare the effectiveness and ROI of using licensed versus unlicensed personnel in connecting patients across the continuum and different risk levels. Healthcare systems should consider standardizing and scaling centralized telephonic care coordination as one strategy to improve cost and quality outcomes in identified populations and continue to evaluate the type of personnel that provides the best ROI for their populations. \$

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NOTE: The "Perspectives in Ambulatory Care" column makes sense of today's changing ambulatory care market. It is written by members of the American Academy of Ambulatory Care Nursing (AAACN) and edited by Kitty Shulman, MSN, RN-BC. For more information about AAACN, please visit www.aaacn.org; email aaacn@aaacn.org; or call (800) AMB-NURS.

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