

Leveraging the Trusted Clinician: Increasing Retention in Disease Management through Integrated Program Delivery

Sharon Glave Frazee, Ph.D.,¹ Bruce Sherman, M.D.,² Raymond Fabius, M.D.,³
Pamela Ryan, R.N., B.S.N., M.H.A., C.P.H.Q., C.C.M.,⁴
Patricia Kirkpatrick, R.N.,¹ and Jeffery Davis, M.B.A.¹

Abstract

Disease management's (DM's) value largely depends on achieving and maintaining participation. Simply being enrolled in a program does not guarantee engaged participation by enrollees, a necessary factor to achieve the improved health outcomes and subsequent reduced health care costs that are the ultimate objective of DM. The objective of this study is to test the hypothesis that an integrated disease management (IDM) protocol (patent-pending), which combines telephonic-delivered disease management (TDM) with a worksite-based primary care center and pharmacy delivery, yields higher patient retention rates than traditional remote DM alone. An earlier study of the IDM protocol found that integrating a worksite-based primary care and pharmacy delivery system with traditional telephonic-based DM substantially increased contact, enrollment, and engagement rates compared to traditional stand-alone telephonic DM. This prospective cohort study tracks contact and enrollment rates for persons assigned to either IDM or traditional TDM protocols and compares participation rates at 6- and 12-month intervals as well as measures of continued retention in the DM program. The IDM protocol showed a significant improvement in participation persistence over traditional TDM. Integrating a worksite-based primary care and pharmacy delivery system led by "trusted clinicians at the workplace"TM with traditional telephonic-based DM not only increases contact and enrollment rates, but also results in higher patient engagement and retention. These improvements in participation are expected to result in improved outcomes for a larger proportion of the target population than traditional telephonic DM. (*Population Health Management* 2008;11:247-254)

Introduction

ONE OF THE MAJOR CHALLENGES faced by DM programs is retaining patients in the program after they enroll.¹ There is general agreement in the literature that it takes at least 6 months after a DM program is initiated for behavioral changes related to lifestyle and disease complications to take effect.² Accordingly, short-term or minimal patient exposure to a program reduces overall program efficacy.

Turnover in DM programs is impacted by factors both beyond and within the control of the program itself. First, employees may lose eligibility for participation in the program as a result of termination of employment or a change in in-

surance coverage. Neither of these factors can be influenced by the DM program. However, the overwhelming reason for erosion is most often due to patients who enroll but then quit before completing the program.³ It is this last factor that can be influenced by DM program design.

Simply being enrolled in a program does not guarantee actual participation. This issue is particularly problematic for the many opt-out DM programs. Most opt-out programs require that the enrollee take some action in order to request removal from the program. It is feasible, however, that an enrollee could remain on the panel of enrolled patients but never actively participate in the program. It would be unreasonable to expect changes as a result of the program from

¹Take Care Health Systems (formerly CHD Meridian Healthcare), Nashville, Tennessee.

²Department of Internal Medicine, Case Western Reserve University School of Medicine, Cleveland, Ohio.

³Take Care Health Systems (formerly CHD Meridian Healthcare), Chadds Ford, Pennsylvania.

⁴Take Care Health Systems (formerly CHD Meridian Healthcare), Albany, New York.

Funding supplied by Take Care Health Systems (self-funded).

these non-active "participants." Even for opt-in programs, retention rates after 1 year are a dismal 29% of enrolled patients.⁴ When low retention rates occur in programs with low enrollment rates, annual retention rates may be as low as 11%.⁴ This helps explain at least some of the difficulty that traditional DM has had in demonstrating a compelling return on investment.

An innovative methodology that integrates DM with worksite-based primary care and pharmacy services was developed with the purpose of improving efficiencies in identifying, contacting, enrolling, and retaining patients in DM programs. This integrated DM (IDM) protocol leverages the patient's relationship with trusted primary care and other worksite-based clinicians to improve patient engagement and retention. The worksite-based clinicians reviewed lists of targeted patients to help correctly identify which of their patients would benefit from DM support of their chronic conditions. They performed outreach through either soliciting enrollment or supporting participation during regularly scheduled office appointments, or by making a telephone call to targeted current patients to explain program benefits and encourage participation. The actual formal enrollment process and tracking of continued participation, however, was completed by a call center nurse via a telephone communication, as is typically done in traditional, telephonic-delivered disease management (TDM) programs.

Prior research has demonstrated that this IDM protocol was able to achieve engagement rates 3 to 5 times that of TDM by coordinating the "trusted clinician at the workplace" with remote telephonic nurse coaches, thereby aligning caregivers into a single integrated delivery model.⁵ This study tests the hypothesis that the IDM protocol, by leveraging the patient's relationship with trusted primary care and other worksite-based clinicians, improves the retention rate of enrolled patients in the IDM program compared to TDM.

Methods

One location of a large, self-insured employer's active and retiree population, their benefits-eligible spouses, and adult dependents was selected for this study. This employer location has an on-site primary care health center and full-service pharmacy available to active and retired employees and their family members. The full employee, retiree, and dependent population at this site consisted of 10,399 members, of which 7818 were age 18 or older on July 1, 2005 (claims and other data were available through June 30, 2005). The adult population eligible for this study was 47% male with an average age of 58. The composition of each study group in terms of employment status (ie, actively employed, dependent, retiree, or early retiree) was approximately equal. Detailed demographic information on the overall study population, target population selection criteria, and the enrollment process are discussed in detail in a previous article.⁵

The IDM protocol was specifically designed to improve the major processes of population-based DM: (1) identify patients with these conditions who may benefit from the program, (2) contact targeted patients, (3) enroll contacted patients in the program, and (4) engage and retain enrolled patients in the program and provide effective DM intervention.

The DM program used for this study targeted patients with diabetes, coronary artery disease (CAD), and/or hypertension (HTN). These 3 chronic conditions are among the most commonly offered DM programs for large, self-insured employers⁴ and occur at relatively high rates in the general population.⁶ Both the IDM and TDM protocol groups were selected using the same basic multi-step process. First, the population of employees, retirees, and dependents age 18 and older who were eligible for health benefits at the start of the study were identified. Medical claims were reviewed and primary diagnosis codes (*International Classification of Diseases, 9th Revision [ICD-9]*) were used to identify patients with recorded diagnosis codes for diabetes, CAD, or HTN. The ICD-9 codes for these conditions were identified based on those used in HEDIS (Healthcare Effectiveness Data and Information Set) methodology. Data for these patients were included in a proprietary predictive model that determined predicted future and avoidable costs for each patient. Predicted costs are costs the patient is expected to incur, while avoidable costs are that portion of predicted costs that might be changed through some type of intervention.

In addition, each patient's proximity to the primary care medical center and pharmacy (PCR_x) was calculated based on the zip code of the patient's home address. Patients whose residence was within 35 miles of the PCR_x were considered to be geographically proximate and to have access to the center for the medical care of their chronic condition. Patients with access to the PCR_x were classified either as Health Center User (Group 1) or as a Proximate Nonuser (Group 2) based on whether an encounter for an office visit at the health center associated with medical care was recorded. Additionally, health center clinicians reviewed the target list of patients to verify whether patients used the health center for treatment of their chronic condition. The resulting patient population was then stratified on costs; those with relatively high avoidable costs (top 2 quintiles) were identified as having the potential for the most significant improvement and were included in the final study target population.

The goal of this patient selection process was to identify a relatively homogeneous population of patients with the target diseases to be subjected to the IDM or TDM protocol based on whether they utilized the worksite primary care health center or community-based care. The final target population consisted of 1890 patients and was relatively homogeneous in terms of age, gender, disease prevalence, and number of comorbidities. Group 3, the Non-Proximate group, had fewer active employees than the other groups. This was not unexpected based on the definition of this group, because most people live within 35 miles of their workplace.

There were 2 differences in the recruitment process between the IDM and TDM groups. First, the IDM protocol group patient list was reviewed by health center clinicians to help appropriately classify which patients receive primary care support for their chronic disease at the health center. Second, IDM protocol patients received direct contact by health center staff, who provided information on the benefits of the DM program, and were invited to participate either face-to-face or via a telephone call. The formal enrollment process, all assessments, and the actual DM interventions were delivered in the same manner to both groups by the same nurse call center staff. Enrollment in this study was defined as agreement to participate and the com-

pletion of the initial 15–20 minute intake assessment call. Neither the IDM nor the TDM groups received any type of monetary or benefit incentive for participation in the DM program. Clearly, however, the major difference between the DM intervention processes following enrollment was that the IDM cohort received integrated primary care support working in coordination with nurse call center staff using a common patient-centered action plan.

In an earlier evaluation of the IDM methodology, significant improvements in both contact efficiency and enrollment efficiency were demonstrated over TDM.⁵ The focus of the current research is to determine whether the IDM protocol improves the retention of participants over the first year of the program compared to TDM. Thus, the research hypothesis (Retention Rate Hypothesis) is that the retention rate of patients enrolled using the IDM protocol will be significantly higher than retention rates for patients enrolled in traditional DM programs. The retention rate metric is operationally defined as the number of patients continually enrolled in the program over a determined period of time divided by the number of patients ever enrolled in the program. The overall study design and metrics found from the evaluation of contact and enrollment efficiency are illustrated in Fig. 1.

The current analysis of retention rates will focus on those patients who enrolled in either the IDM or TDM program during the initial enrollment campaign, which began in February 2006 and continued for 90 days. During this time period, 693 (62%) of the successfully contacted patients agreed to participate in either IDM or TDM. Tracking of patient demographic and clinical information, the patient contact and enrollment process, as well as all contacts between the nurse coach and patient were performed using a proprietary DM

information system application. Demographic information about the enrolled population and the 3 subgroups as defined are shown in Table 1.

As shown in Table 1, HTN is the most common of the 3 diseases in the enrolled population, followed by CAD and diabetes. No major differences in chronic condition prevalence occur between the 3 subgroups. Male patients comprise 59% of the enrolled population. In the IDM protocol group (Group 1), more than two thirds of the enrollees are male compared to only 52% (Group 2), and 54% (Group 3) of the telephonic-only protocol groups. The average age of enrollees is 61.9 years, with the IDM protocol group being slightly younger at 61.0 years of age. Retired employees made up over half of all enrolled patients, with the largest percentage (58%) in the IDM protocol group.

Measuring retention

During the course of the program, enrollment status was tracked through the use of standardized comments added to the DM application, which recorded the disposition of each contact event with the patient. Patients are considered as retained enrollees until the date they: (1) request disenrollment from the program either verbally or in writing; (2) fail to respond to a sequence of outbound contact attempts for a period of 3 months; (3) die, become too ill to participate, or enter a long-term care facility; or (4) become ineligible for health benefits from the self-insured employer. Patients in both the IDM and TDM protocols were contacted by DM call center nurses on a scheduled basis, the frequency of which is based on individual patient assessment results, clinical staff judgment, and patient preferences.

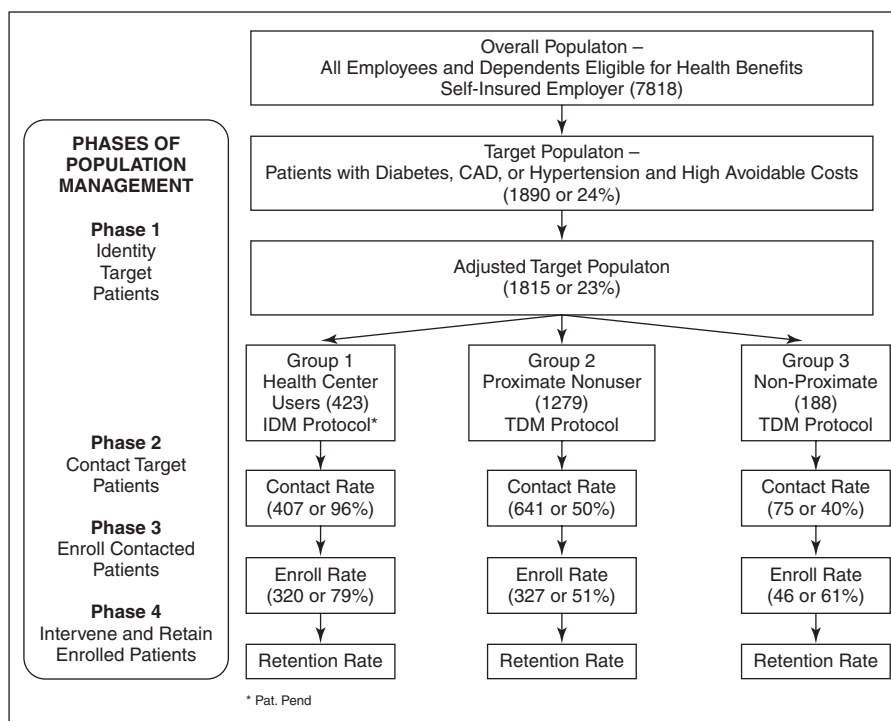


FIG. 1. Evaluation of process metrics for integrated disease management (IDM) versus telephonic-delivered disease management (TDM). CAD, Coronary Artery Disease.

TABLE 1. ENROLLED STUDY POPULATION DESCRIPTIVES

	<i>Enrolled study population (n = 693)</i>	<i>Group 1: health center users, IDM protocol (n = 320)</i>	<i>Group 2: proximate non users, TDM protocol (n = 327)</i>	<i>Group 3: non-proximate, TDM protocol (n = 46)</i>
Diabetes	45%	49%	42%	41%
Coronary artery disease	56%	59%	52%	57%
Hypertension	85%	85%	85%	83%
% Male	59%	67%	52%	54%
Mean age (in years)	61.86	61.02	62.70	61.72
% Active employees	13%	15%	11%	11%
% Active dependents	10%	8%	13%	11%
% Retired employees	53%	58%	49%	46%
% Retired dependents	24%	19%	28%	33%

IDM, integrated disease management; TDM, telephonic-delivered disease management.

Retention rates were examined at 6-month (182 days) and 12-month (365 days) intervals from the date the patient enrolled in the program. Comparisons between the 3 groups and to previously published DM retention rates were evaluated to determine the statistical significance of any differences between the groups. The number of enrollment days was computed by subtracting the date of enrollment from the disenrollment date or the end of 1 year of continuous enrollment for each patient, whichever came first. A person is considered retained for 6 months when they are continuously enrolled for a period of 182 days and for 12 months when the continuous enrollment period is 365 days. The retention rate for each group was computed by dividing the number of continuously enrolled patients by the number of patients in the original group targeted for contact. This allows us to demonstrate what proportion of the population deemed to potentially benefit from DM was ultimately able to participate for a period long enough to be effective. Both Student *t* tests and Fisher's Exact Test were used for comparisons of differences between the groups. For all statistical tests, a 2-tailed *P* value of < .05 was considered statistically significant. All analyses were conducted using SAS Version 9.1 software (SAS Institute Inc., Cary, North Carolina).

Results

Lasting retention of patients in DM programs is essential to achieve the medical management and behavioral changes necessary to improve health outcomes. In the current study, retention rates for the 693 enrolled patients were examined at 6-month and 12-month intervals. From enrollment through the conclusion of the first year of the intervention period, a substantial proportion of all patients, both IDM and TDM, were retained. This is illustrated in Fig. 2.

As described earlier, the IDM protocol group differed very little from the TDM protocol group in terms of demographics, disease burden, or the actual DM intervention. In addition, further analysis found that retained and lost patient subgroups were similar with respect to gender, age, and chronic disease condition. Inability to reach the patient after multiple attempts at follow-up contact was the most frequent

reason for disenrollment, representing approximately half of disenrolled patients (49% at 6 months and 53% at 12 months).

Table 2 illustrates the detail of the findings for the retention analysis. The retention rate is defined as the proportion of the original target population still actively enrolled at each time dimension. Of the 693 patients enrolled in the study, only 47 (7%) withdrew from the DM program prior to 6 months and 164 (24%) disenrolled prior to 12 months. The remaining 529 (76%) enrollees were retained in the DM program at 12 months following enrollment. This represents an overall 28% of the original population (*n* = 1890) targeted for contact. Group 1, the IDM protocol, demonstrated the greatest ability to retain patients with retention rates of 71% at 6 months and 62% at 12 months. In contrast, for the TDM protocol, only 19% (74% of enrolled) of those who live in geographic proximity to the health center (Group 2) were retained at 12 months, and 14% (57% of enrolled) of those who live further away from the health center (Group 3) were retained at 12 months. The IDM protocol group demonstrated retention rates that were nearly 2.3-fold greater than Group 2 and nearly 3.5-fold greater than Group 3. Overall, there was a greater than 2.4-fold increase in retention compared to the combined TDM retention rate of 28% (*p* < 0.01). Thus, the Retention Rate Hypothesis (ie, the retention rate for patients enrolled using the IDM protocol will be significantly higher than retention rates for patients enrolled in a traditional DM program) is affirmed.

Discussion and Conclusions

The IDM methodology increased the duration of time an enrollee remains in the DM program. Health benefits from DM can be realized only if people can be engaged and retained. Therefore, if the IDM methodology improves retention of enrollees in DM programs it is expected that it will eventually improve population health outcomes when compared to traditional TDM.

Chronic diseases affect approximately 90 million people in the United States, and related treatment costs for these diseases account for 70% of total health care expenditures.⁶ In 2008, the DM industry is estimated to exceed \$1.8 billion in size, and there seems to be no slowdown in its growth.⁷

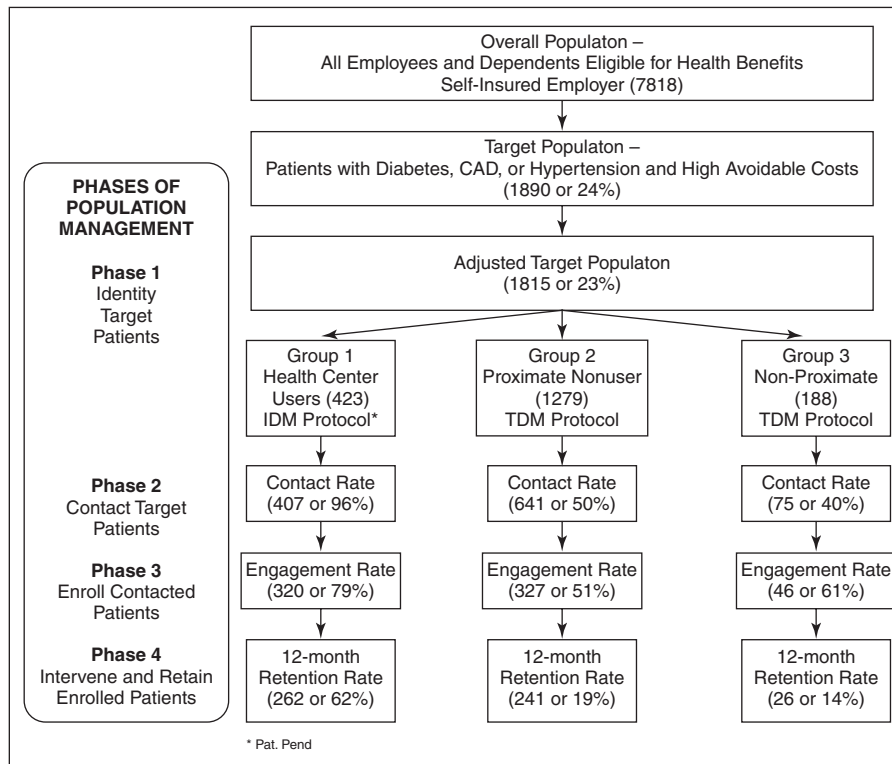


FIG. 2. Retention rates at 6-months and 12-months for integrated disease management (IDM) versus telephonic-delivered disease management (TCM). CAD, Coronary Artery Disease.

Nearly all of the top 150 US commercial health insurance plans offer some form of DM,⁸ and many large employers, especially Fortune 500 businesses, provide access to DM programs for their employees. As the DM industry matures, there is increasing recognition that it must adapt to become more efficient. With over 20 million Americans receiving telephonic DM programs, improving the efficiency of contacting, enrolling, and retaining patients in these programs has the potential to reduce overall costs while increasing participation rates. The latter is expected to increase the overall

impact of DM programs even if the actual percent of patients showing improvements “downstream” does not change. This study has evaluated a new protocol that shows promise for increasing not only contact and enrollment efficiency, but also for increasing the rate of patient persistence in DM programs, thereby ensuring sufficient time to achieve optimal benefit. In addition, the value of the “trusted clinician” in patient retention is quantified.

The value of the “trusted clinician” is most apparent in Group 1, the IDM protocol, in which the on-site primary care

TABLE 2. STUDY POPULATION ENROLLMENT AND RETENTION RATES COMPARED TO PUBLISHED BENCHMARK STUDY

	n targeted for attempted contact	n contacted (% contacted)	n enrolled (% of target group enrolled)	n Retained at 6 months (% of target group retained at 6 months)	n retained at 12 months (% of target group retained at 12 months)	Percent improvement realized from IDM protocol (P value)
Group 1: IDM Protocol	423	407 (96%)	320 (76%)	302 (71%)	262 (62%)	
Group 2: TDM Protocol	1279	641 (50%)	327 (26%)	305 (24%)	241 (19%)	229% (< .0001)
Group 3: TDM Protocol	188	75 (40%)	46 (24%)	39 (21%)	26 (14%)	348% (< .0001)
Published Benchmark*	12,047	9456 (78%)	4561 (38%)	2046 (17%)	1315 (11%)	467% (< .0001)

*See Lynch WD, Chen CY, Bender J, Edington DW. Documenting participation in an employer-sponsored disease management program: selection, exclusion, attrition, and active engagement as possible metrics. *J Occup Environ Med.* 2006;48:447-454. IDM, integrated disease management; TDM, telephonic-delivered disease management.

health center and pharmacy personnel were able to not only provide improved selection and contact information over what is traditionally available to DM programs, but also to become part of the recruitment team, encouraging patients to enroll. While the actual DM program was delivered telephonically by call center DM nurses, the involvement of the trusted clinician in the enrollment process and the encouragement provided during intermittent primary care visits appear to increase the commitment of patients to maintain ongoing program participation. Participating in DM programs requires considerable effort and commitment on the part of patients, as they must spend time providing information to the call center nurse, reveal personal health information and details about their lifestyle that impact their condition, and set goals for change. When encouragement is provided by their “trusted clinicians,” enrollment rates and retention rates are dramatically improved. This is a key distinction of the IDM program because community providers may be unaware that their patients are either eligible for or enrolled in a DM program, so encouragement from them is less likely.

Retention is important for 2 reasons. First, it is assumed that patients who remain in DM programs are more likely to benefit from the DM interventions. Second, DM program savings are optimized only over the long term. For instance, one study of continuously enrolled patients found that savings generated per enrollee rose from \$233 in year 1 to \$375 in year 2, to \$944 in year 3 and, finally, to \$950 in year 4, the final year of the study.⁹ While the current study followed patients for only 1 year, longer term retention rates are expected to be higher than for traditional DM programs if for no other reason than retention at 1 year is higher. Any additional attrition from DM program participation, even following the same trend as other programs, would still result in a greater retention of enrolled patients over time.

Higher retention rates for the IDM protocol group are attributed to the perception by patients that the DM program is beneficial and valuable, in part because their trusted clinician supports their ongoing participation. Physicians are the most trusted source of health information; the clinician-pa-

tient relationship consistently ranks as one of the most important in people’s lives.¹⁰

Because no 2 DM programs are alike, we compared the retention rates from the IDM protocol to those found in the study published by Lynch and colleagues in 2006.⁴ Not only is this one of the most well-documented studies of telephonic DM enrollment and retention, but the population is very similar to the study population herein. The Lynch study included a large company’s active and retired workers and dependents covered by employer-sponsored health insurance and used similar HEDIS methodology to determine applicable diagnosis codes for inclusion in the target population. The diseases targeted are somewhat different, however. The current IDM study included patients with diabetes, cardiovascular disease, and HTN, while the Lynch study targeted asthma, diabetes, cardiovascular disease, and congestive heart failure. However, the Lynch study found consistent attrition across the 4 diseases, making the inclusion of asthma unlikely to have a significant impact on study comparability.

The Lynch study, which tracked enrollment rates in a similar manner to the current study, found retention rates of only 17% at 6 months and 11% at 12 months, as shown in Table 2. The retention rates found by Lynch are consistent with those for the TDM groups in the current study, which indicates that the retention rates in the current study for the TDM groups are comparable to what others have found. With this assumption it is easy to see that the IDM protocol retains between 3 and 6 times the number of enrollees as traditional DM programs. This is illustrated in Figure 3. In addition, retention rates from using the IDM protocol are higher than those of other studies that have demonstrated increased retention rates, and higher than the Lynch et al study in which referrals were made in other settings. For example, higher retention rates were noted among individuals who were enrolled in DM programs when seeking treatment advice via a telephonic nurse advice line.¹¹ Here, retention rates of 55% at 1 year were found despite the fact that the enrolled patients were arguably more motivated because they were actively seeking advice at the time of enrollment.

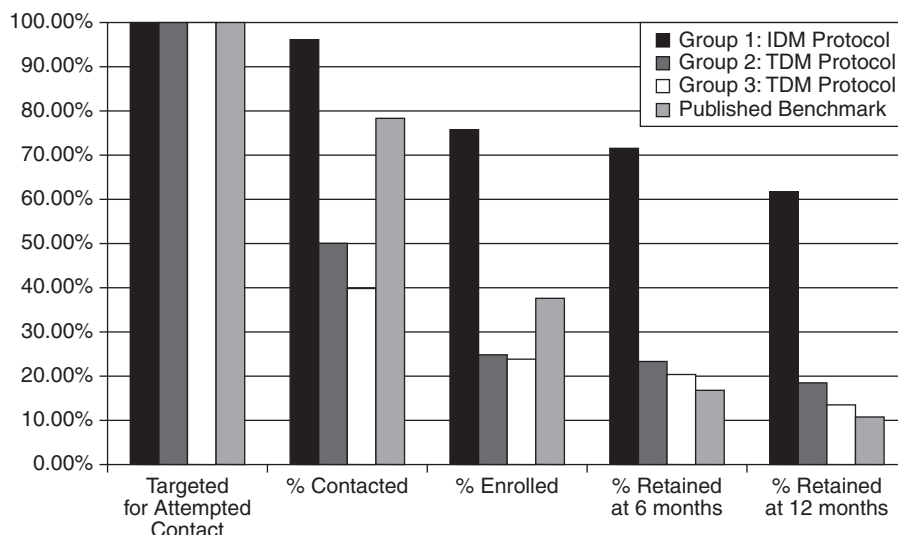


FIG. 3. IDM Study Population versus Published Benchmark.

It should be noted that, while the Lynch study is the largest equivalent reference population study available for comparison, this comparison must be approached with caution because the Lynch study selected approximately two thirds of the identified population with a primary diagnosis code for asthma (493), diabetes (250), cardiovascular disease (410–414), or congestive heart failure (428) in the previous 12 months. The group selected for contact limited selection from the identified population based on availability of contact information and prioritization by the patient's total paid medical and pharmacy claims for the last year. This differs from the IDM study in which the original identification was similar, but the group targeted for contact was the one-third of the population with the highest avoidable costs. No consideration of lack of contact information was made for the IDM study. Because the Lynch study casts a wider net in terms of selection criteria, it stands to reason that those in the contact target group will include those less ill and perhaps less willing to enroll in a DM program. However, when comparing the IDM group to the TDM groups in the current study, which used the same criteria for inclusion in the contact target group, the differences show that the improvement realized by IDM is both very large and statistically significant.

While the results of this study are quite promising for the DM industry, there are several limitations. First, only 1 self-insured employer with an on-site health center was studied. However, this employer has a large employee population and the results were statistically significant. While not directly related to the results of this study, it should be noted that worksite primary care and pharmacy centers are most common with self-insured employers that have a geographically concentrated workforce. The need for a critical mass of employees at a given location (typically around 1500 employees) is primarily economic in nature, because a certain level of utilization is necessary to provide an adequate return on investment in the context of worksite health center operating costs. Involving "trusted clinicians" in the IDM protocol was simplified because they all operated from an on-site health center and were encouraged to work with their patients to stimulate participation and continued engagement. No incentives or other rewards were offered for the clinician's cooperation, however, so it is conceivable that involving clinicians in non-workplace models would still garner improvements in engagement and retention. While no additional costs were incurred in the implementation of the IDM protocol over those of the TDM protocol, if incentives were required to encourage clinicians to promote participation in DM programs they would necessarily increase the cost of such a program. Whether clinicians in non-workplace settings could be motivated to encourage participation by their patients is beyond the scope of this study and should be tested in future studies.

Second, the nature of administrative claims data lends itself to some limitations. Claims data are collected primarily for billing purposes, thus using coding algorithms to determine the existence of disease may be incorrect insofar as the data do not include all clinically relevant information. Another limitation is the inability to know with confidence whether the claims available for a patient are exhaustive. Incomplete data would mean missing potential patients who

had at least 1 of the diseases included in this study. The integration of clinical information from primary care and pharmacy clinicians can help to reduce this limitation but will fail to identify individuals with no relevant disease-associated health care claims.

Last, this research is based on an opt-in model and therefore may not be applicable to opt-out program models. That being said, however, we believe that encouragement from a "trusted clinician" would increase actual engagement and participation for even those programs in which passive enrollment is still considered "enrolled" and "retained."

Using a primary care setting to deliver chronic care management has shown promise in recent studies.^{4,10} Future research studies should extend this IDM protocol to multiple clients in order to improve the generalizability of the results of this study. Importantly, while this study focused primarily on process metrics, future studies are planned to evaluate the clinical, financial, and utilization outcomes of the patients enrolled in IDM versus those enrolled in the TDM protocol. These subsequent studies will help to quantify the value proposition for the IDM protocol and provide a business justification for employer uptake.

This research, combined with our earlier results demonstrating significantly higher engagement through the IDM protocol, now establishes the importance of the "trusted clinician" in promoting patient retention in DM programs. Involving clinicians more closely in DM efforts is hardly a new idea, but this study does test the impact of clinician involvement in 1 setting with promising results. With the cumulative effects of greater engagement and improved retention, this IDM protocol results in a 4- to 6-fold greater long-term patient participation rate than TDM. The findings suggest that coordinating the "trusted clinicians at the workplace" with remote telephonic nurse coaches aligns clinicians into a single, integrated delivery model, and improves the efficiency and effectiveness of care delivery. While higher retention rates are an important process measure, outcomes such as improvements in health status, reduced costs, or improved clinical indicators are the real test of a DM program's effectiveness. This will be addressed in future research. Improving engagement and retention rates are important steps, but the authors recognize that these do not cover the totality of DM program evaluation.

Employers have become increasingly interested in population health management strategies as a means to control health care costs and increase workforce productivity. The importance of having a "trusted clinician at the workplace" to encourage enrollment and ongoing participation in DM programs has been shown in this study to be so strong that it would behoove employers who are truly interested in the health of their employees to implement and cultivate a workplace health center. Incorporation of an IDM program as part of an integrated worksite care delivery model may contribute to achieving health and productivity management goals.

Disclosures

Drs. Frazee and Fabius, and Ms. Kirkpatrick, Ms. Ryan, and Mr. Davis were employed by Take Care Health Systems (formerly CHD Meridian Healthcare) during this research project, which offers integrated disease management services.

References

1. MacStravic S. The challenge of participation in disease management. *Dis Manag.* 2007;10:247–251.
2. Linden A, Adams JL, Roberts N. An assessment of the total population approach for evaluating disease management program effectiveness. *Dis Manag.* 2003;6:93–102.
3. MacStravic S. Evaluating disease management results: individuals and cohorts vs. populations. *Dis Manag.* 2007;10:185–188.
4. Lynch WD, Chen CY, Bender J, Edington DW. Documenting participation in an employer-sponsored disease management program: selection, exclusion, attrition, and active engagement as possible metrics. *J Occup Environ Med.* 2006;48:447–454.
5. Frazee SG, Kirkpatrick P, Fabius R, Chimera J. Levering the trusted clinician: documenting disease management program enrollment. *Dis Manag.* 2007;10:16–29.
6. Centers for Disease Control and Prevention (CDC). *The Burden of Chronic Diseases and Their Risk Factors: National and State Perspectives 2004*. Atlanta, GA: US Department of Health and Human Services; 2004. Available at: <<http://www.cdc.gov/nccdphp/burdenbook2004/>>. Last accessed August 28, 2008.
7. Mattke S, Seid M, Ma S. Evidence for the effect of disease management: is \$1 billion a year a good investment? *Am J Manag Care.* 2007;13:670–676.
8. Matheson D, Psacharopoulos D, Wilkins A. Realizing the promise of disease management: payer trends and opportunities in the United States. 2006. Available at: <http://www.bcg.com/publications/files/Realizing_the_Promise_of_Disease_Management_Feb06.pdf>. Last accessed August 28, 2008.
9. Stave GM, Muchmore L, Gardner H. Quantifiable impact of the contract for health and wellness: health behaviors, health care costs, disability, and workers' compensation. *J Occup Environ Med.* 2003;45:108–117.
10. Magee M. Relationship-based health care in the United States, United Kingdom, Canada, Germany, South Africa and Japan: a comparative study of patient and physician perceptions worldwide. Presented at: World Medical Association Conference; September 11, 2003; Helsinki, Finland. Available at <http://www.wma.net/e/press/pdf/2003_15.pdf> Last accessed August 28, 2008.
11. Berg GD, Korn AM, Thomas E, Klemka-Walden L, Bigony MD, Newman JF. Opening the door to coordination of care through teachable moments. *Dis Manag.* 2007;10:285–292.

Address reprint requests to:

Sharon Glave Frazee, PhD
200 Burton Hills Blvd, Suite 200
Nashville, TN 37215

E-mail: sharon.frazee@takecarehealthcare.com