Evaluation of an Integrated Adherence Program Aimed to Increase Medicare Part D Star Rating Measures

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ABSTRACT

BACKGROUND: The Centers for Medicare & Medicaid Services (CMS) Plan Quality and Performance Program, or Star Ratings Program, allows Medicare beneficiaries to compare quality of care among available Medicare Advantage prescription drug (MA-PD) plans and stand-alone prescription drug plans (PDPs). Health plans have increased intervention efforts and applied existing care management infrastructure as an approach to improving member medication adherence and subsequent Part D star rating performance. Independent Care Health Plan (*i*Care), an MA-PD plan; MedImpact Healthcare Systems, Inc. (MedImpact), a pharmacy benefits manager; and US MED, a mail order pharmacy, partnered to engage and enroll *i*Care's dual-eligible special needs population in an intervention designed to improve patient medication adherence and health plan performance for 3 Part D patient safety outcome measures: Medication Adherence for Oral Diabetes Medications (ODM), Medication Adherence for Hypertension (HTN), and Medication Adherence for Cholesterol (CHOL).

OBJECTIVES: To (a) assess the effectiveness of a coordinated member-directed medication adherence intervention and (b) determine the overall impact of the intervention on adherence rates and CMS Part D star rating adherence measures.

METHODS: Administrative pharmacy claims and health plan eligibility data from MedImpact's databases were used to identify members using 3 target medication classes. Adherence was estimated by the proportion of days covered (PDC) for all members. Those members considered at high risk for nonadherence were prioritized for care management services. Risk factors were based on members' use of more than 1 target medication class, newly started therapy, and suboptimal adherence (PDC < 80%) in the most recent 6-month period. Data files listing member adherence rates and contact information were formatted and loaded monthly into *i*Care's care management system, which triggered an alert for care coordinators to counsel members on the importance of adherence and offer the members an option for monthly 30-day supply medication delivery via US MED. Member adherence rates were calculated 9 months pre- and postimplementation for all members and adjusted by length of member enrollment based on CMS technical specifications. Regression analysis assessed pre-post changes in rates comparing 2 intervention groups: (1) members receiving *i*Care counseling only (*i*Care-only) and (2) members receiving counseling and medication delivery (*i*Care + US MED). To evaluate the overall impact of the intervention, *i*Care's adherence rates and *i*Care's measure-specific star ratings for the 2011 and 2012 calendar years (CMS measurement years) were compared with the national MA-PD plan contract average and with a health plan similar in member characteristics but without adherence intervention exposure.

RESULTS: A total of 2,700 members were initially targeted for referral to *i*Care care management and US MED customer service specialist teams. Between April 2012 (implementation date) and January 2013, 1,302 (48.2%) members enrolled in the US MED component of the intervention. Seventy-six percent of identified members were nonadherent (PDC < 80%) to 1 of the 3 target medication classes, and 32% of members were nonadherent to more than 1 target medication class. Pre-post absolute average adherence rates increased for the *i*Care-only group (ODM = 15.1, HTN = 10.1, CHOL = 13.6) and the *i*Care-US MED group (ODM = 30.9, HTN = 25.5, CHOL = 29.4). From 2011 to 2012, *i*Care adherence rates increased by absolute differences of 15.2, 9.2, and 10.1 percentage points for ODM, HTN, and CHOL measures, respectively, compared with the average MA-PD plan contract differences (1.1, 2.1, and 2.5) and the comparator health plan differences (-2.7, -1.4, and -4.1). Increases in *i*Care's adherence rates were associated with significant increases in *i*Care's 2014 adherence measure star ratings (1 star to 3 stars for ODM and CHOL, 1 star to 2 stars for HTN), which contributed to increases in the Drug Plan Quality Improvement measure (2 stars to 4 stars) and *i*Care's overall Part D star rating (3 to 3.5 stars).

CONCLUSIONS: Members in this MA-PD plan dual-eligible population benefited from multiple points of contact to achieve increased adherence. Health plans can use network pharmacies, care management staff, and their pharmacy benefits managers to collaborate and implement interventions aimed to improve members' adherence to targeted maintenance medications and overall health plan quality performance and star ratings.

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What is already known about this subject

- National agencies such as Centers for Medicare & Medicaid Services (CMS), Pharmacy Quality Alliance, National Committee for Quality Assurance, and National Quality Forum recognize nonadherence as a prevalent public health problem.
- Medicare plans continue to search for effective and novel approaches to improve quality of care and performance in CMS star ratings.
- Special Needs Plans (SNPs) experience lower adherence rates and lower star ratings than other Medicare Advantage prescription drug plans. Enrolling a special needs population in health care behavior interventions can be challenging.

What this study adds

- An integrated and targeted intervention can drive positive changes in medication adherence patterns and CMS star ratings.
- Results show a persistent intervention increased a plan's star ratings for the 3 medication adherence patient safety measures by 2 stars (Diabetes Medications and Cholesterol) and 1 star (Hypertension).
- Partnerships between health plans, pharmacy benefits managers, and network pharmacies can effectively engage members of SNPs to improve adherence to maintenance medications.

Medication nonadherence continues to be a pandemic problem despite decades of exploratory research, multimodal interventions, and nationwide promotional campaigns.[1-4] Among Medicare Part D beneficiaries, the Centers for Medicare & Medicaid Services (CMS) reported 2012 adherence rates to medication classes used to treat 3 highly prevalent disease conditions (diabetes, hypertension, and hyperlipidemia) as significantly lower (75%, 77%, and 71%, respectively) than the most commonly recommended and published adherence threshold of 80%.[5] For beneficiaries receiving low-income subsidies (LIS), adherence rates are 5 to 7 percentage points lower compared with non-LIS beneficiaries.[6]

The consequences of poor adherence include unnecessary morbidity and mortality, lost quality of life, increased medical utilization, and poor health outcomes.[1,2,7-13] Health care costs attributable to suboptimal adherence are estimated at $177 billion per year.[2] Several national organizations committed to improving quality of care, namely CMS, National Committee for Quality Assurance, Pharmacy Quality Alliance, and National Quality Forum, recognize poor adherence as a major public health problem. The CMS Plan Quality and Performance Program, or Star Ratings Program, which measures health plan performance and allows members to compare the quality of available Medicare Advantage prescription drug (MA-PD) plans and stand-alone prescription drug plans (PDPs), increased the weighting of 3 Part D patient safety medication adherence measures (Medication Adherence for Oral Diabetes Medications, Medication Adherence for Hypertension, and Medication Adherence for Cholesterol) to 3 times that of other Part D measures.[14] For the 2014 plan star ratings, these 3 Part D measures contributed to approximately 11% of an MA-PD plan contract's overall star rating and 32% of the Part D star rating.[14]

As an approach to improving medication adherence and subsequently star ratings, many Medicare plans have increased the use of broad member-directed or provider-directed interventions. Independent Care Health Plan (*i*Care), an MA-PD plan with a dual-eligible special needs population, received the lowest star rating (1 star) for each of the 3 adherence patient safety measures for the 2010 and 2011 performance measurement years, which represent the 2012 and 2013 plan ratings, respectively. The demographic makeup of *i*Care includes members that are often transient, are LIS recipients, and may be affected by mental illness and substance addiction. These issues present many challenges regarding contacting and counseling members about medication adherence. Previous intervention attempts directed at prescribers to inform them of potential member nonadherence issues were not comprehensive and demonstrated little effectiveness. Therefore, MedImpact Healthcare Systems, Inc. (MedImpact), a pharmacy benefit manager; *i*Care; and US MED, a mail order pharmacy, collaborated to design a member-directed adherence intervention aimed to improve quality of care, member adherence, and plan performance for the 3 medication adherence Part D patient safety measures. The purpose of this research was to assess the effectiveness of this member-directed intervention by measuring changes in members' adherence rates and *i*Care's star ratings.

Methods

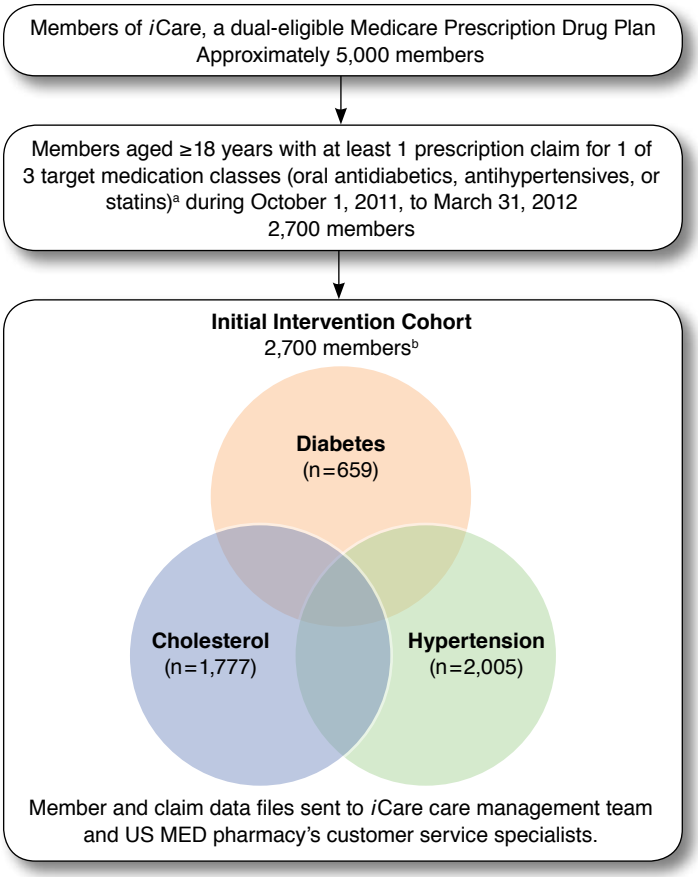
Study Design and Population

This research is a retrospective analysis of a quasi-experimental intervention using the administrative pharmacy claims and health plan eligibility data from the MedImpact research database. The study population comprised enrolled members of *i*Care, a dual-eligible Special Needs Plan (SNP) based in southeast Wisconsin (mainly the Milwaukee metropolitan area), during the calendar years of 2011, 2012, and 2013. Members aged 18 years and older with at least 1 pharmacy claim for 1 of 3 target medication classes between October 2011 and March 2012 were identified for the intervention beginning April 2012 (Figure 1). Subsequent monthly queries of pharmacy claims using similar inclusion criteria identified additional members for intervention during the remaining months of 2012. Members were categorized as *i*Care-only enrollees or *i*Care + US MED enrollees based on their participation in the US MED component of the intervention. Medication adherence to the 3 medication classes was measured 9 months pre- and post-implementation for all members and stratified by participation group. Health plan adherence rates published by CMS for the 2010, 2011, and 2012 calendar years (CMS measurement periods) were used to evaluate the intervention effects on *i*Care's star ratings.

Intervention

This coordinated medication adherence intervention used existing care management infrastructure to create a member-focused program for members utilizing medications in the 3 CMS targeted therapeutic classes. Starting in April 2012, monthly analyses of pharmacy claims data over 6-month review periods were used to identify members who were nonadherent to therapy as calculated by the proportion of days covered (PDC < 80%). Data files containing member contact and demographic information (e.g., phone, address, age, and gender); provider and pharmacy contact information (e.g., name and phone); calculated adherence rates; and known risk factors for nonadherence (such as nonadherent to more than 1 targeted medication class and therapy-naïve) were prepared and loaded into the care management system used by *i*Care, called TruCare. Approximately 29 care managers and care coordinators from *i*Care's care management department received monthly alerts presented in the form of a "task" that triggered them to call their members to address medication nonadherence and review recent prescription fill history. Care coordinators and managers, most of whom were experienced in

FIGURE 1 Selection Diagram of Initial Intervention Cohort



[a]Prescription claims for target medication classes were identified using NDC lists accessed from CMS Technical Notes.[14]
[b]Members could be identified for intervention by more than 1 medication class.
CMS = Centers for Medicare & Medicaid Services; iCare = Independent Care Health Plan; NDC = National Drug Code.

human and social services, were trained on the importance of medication adherence and common reasons for nonadherence. Calls permitted an open conversation between the care coordinator/care manager and *i*Care member. No particular call script was followed; however, a typical question after review of the member's pharmacy fill history was the following: "I see you have not filled your high blood pressure medicine in a while—do you still take that medicine?" If the member indicated that he/she was currently taking the medication, follow-up questions could be "How often do you forget to take your medicine?" or "Do you have trouble getting to the pharmacy to get your medicine?"

All members were also provided an option for monthly scheduled, auto home delivery of 30-day supply target medications provided by US MED. In addition, members interested in this option were referred to US MED and received customized outbound calls from US MED pharmacy's customer service specialists. Members opting into the home delivery program (*i*Care + US MED group) received enrollment materials consisting of a cobranded introductory letter from the health plan and pharmacy, a printed application, and a US MED Welcome Guide. A web-based tool allowed real-time communication between *i*Care's care management team and the pharmacy's customer service team to facilitate member enrollment and update member contact information. Member contact information was verified and corrected by the care management teams, physician office visits, online databases, and the National Change of Address database in order to maintain member enrollment.

The US MED team sent weekly emails to *i*Care care management staff to inform the care management team about any difficulties obtaining new prescriptions (e.g., member needing an appointment or incorrect prescriber information provided). Satisfaction surveys were provided to enrollees throughout 2012, and members could opt-out of the program at any time. Survey questions used a 5-point Likert-type scale to ask members to rank their overall satisfaction with the pharmacy, satisfaction with friendliness and professionalism of the pharmacy contact person, likelihood to use the pharmacy in the future, and likelihood of referring friends and family.

Members not enrolling in the US MED component (*i*Care-only group) were called monthly, and those contacted were counseled by the *i*Care care management team. Each month, member and medication adherence data files were sent to *i*Care to identify new members for intervention and to update existing members' adherence rates for continued counseling. The care management team's goal was to contact all members identified as nonadherent (approximately 900 tasks per month) within 30 days of receiving a task. Members identified as nonadherent in consecutive months were contacted multiple times over the study period.

Initial evaluation of the intervention in September 2012 identified a large proportion of members that could technically reach the adherence threshold (PDC ≥ 80% as used by CMS) by the end of the measurement year with additional medication supply. In other words, members' prescription claims for the January through September 2012 time period were used to estimate members' current PDC for the 2012 measurement year and forecast the worst and best case PDC performance scenarios for each member's year-end PDC, assuming days' supply was available for the remaining days in the year. These additional prioritized member files were provided twice by MedImpact to *i*Care in October and late November 2012. Two *i*Care Pharmacy Services Representatives (PSRs) used the files to determine the calling order of members based on members' last date of medication fill and anticipated end of supply. For example, a member that last filled his/her lisinopril on October 7, 2012, was called on or near November 7, 2012, if the

TABLE 1 Characteristics of the Initial Intervention Cohort (N = 2,700)

	Diabetes (ODM)	Hypertension (HTN)	Cholesterol (CHOL)
Member count, n	659	2,005	1,777
Female, n (%)	444 (67.4)	1,278 (64.7)	1,141 (67.2)
Age, years, mean (SD)	60.7 (12.3)	60.8 (12.6)	61.7 (61.7)
Age group, n (%)			
<54	203 (30.8)	621 (31.0)	513 (28.9)
55-64	183 (27.8)	549 (27.4)	473 (26.6)
65-74	193 (29.3)	567 (29.3)	533 (30.0)
75+	80 (12.1)	268 (13.4)	258 (14.5)
Baseline adherence status, n (%)			
Adherent, PDC ≥80%	473 (71.8)	1,375 (68.6)	1,155 (65.0)
Nonadherent, PDC <80%	186 (28.2)	630 (31.4)	622 (35.0)
Identified by >1 medication class, n (%)[a]	578 (87.7)	1,294 (64.6)	1,274 (71.7)
Baseline treatment status, n (%)[b]			
New to therapy	117 (17.8)	360 (18.0)	357 (20.1)
History of therapy	542 (82.2)	1,645 (82.0)	1,420 (79.9)
Pre-index medication count, mean (SD)	13.3 (6.1)	13.0 (6.5)	13.4 (6.6)
Comorbidity count, mean (SD)	4.5 (2.3)	4.4 (2.3)	4.4 (2.4)
Comorbidity, %[c]			
Asthma/COPD	42.1	43.6	43.7
Hypertension	87.1	65.6	86.8
Depression/anxiety	25.3	25.3	27.2
Diabetes	90.8	45.0	46.8
Gastric acid disorder	41.8	45.7	46.8
Infections	42.7	44.0	46.0
Inflammatory/ autoimmune	42.1	23.9	25.8
Multiple sclerosis/ paralysis	23.8	24.1	24.0
Pain management	66.6	70.6	70.2
Seizure disorders	22.6	25.4	27.0
Prescriber specialty, %			
Cardiology	3.2	6.4	12.1
Endocrinology	12.7	6.7	6.7
Family practice	31.5	33.5	33.5
Internal medicine	36.8	34.3	31.5
Nurse practitioner	8.7	8.7	5.7
Physician assistant	3.4	3.4	3.4
Other specialty	4.5	4.6	4.7

[a]Members could be identified for intervention by more than 1 medication class.
[b]New to therapy if absence of a prescription claim in 180-day baseline period.
[c]Comorbidity measured by Medicaid Rx. Reported for categories where prevalence was >20%.
COPD = chronic obstructive pulmonary disease; PDC = proportion of days covered; SD = standard deviation.

member had not filled before that date. If the PSRs were not able to reach the member, the pharmacy was called and the pharmacist or pharmacy technician was asked to contact the member regarding a refill of the target medication.

The adherence intervention was augmented in January 2013 with a refill reminder component. This program component used interactive voice response (IVR) technology to conduct telephonic outreach to members 7 days late in refilling medications for each of the 3 target classes. Upon member authentication, target members received a customized message reminding them to refill their medications and asking if they intended to refill. Those members responding "No" to this introductory question were asked to select 1 of 5 options that best fit their reasons for not planning to refill. The 5 options were cost, doctor said stop, don't believe they need the medication, don't understand instructions, and medication side effects. The evaluation of this refill reminder component allowed an assessment of self-reported reasons for nonadherence and was used to improve the intervention in 2013. Detailed IVR program reports were provided weekly and reviewed by *i*Care Pharmacy Services. For members self-reporting a barrier to adherence that *i*Care considered clinical in nature (i.e., don't believe they need the medication, don't understand instructions, or side effects), the information was referred to an *i*Care nurse for follow-up.

Study Measures

Total number of members identified for the intervention was measured for the initial cohort and for each medication class for the 2012 calendar year. To gauge member enrollment in the US MED component of the intervention, the enrollment rate was calculated as the proportion of identified members that consented to participate in the US MED program.

The main outcomes of interest were member adherence rates and health plan adherence rates. Member adherence rates were calculated as the PDC for 3 medication classes as defined by specifications from the CMS Medicare Health & Drug Plan Quality and Performance Ratings 2013 Part C & Part D Technical Notes (released October 10, 2012)[14] and Acumen, LLC (CMS contractor) Patient Safety Analysis Report User Guide.[15] Specifically, for members aged 18 years and older with at least 2 claims for the target medication measure, PDC was measured from first claim in the measurement period (index date) to end of the measurement period or member disenrollment. Days of medication coverage to at least 1 medication in the class was calculated using fill dates and days' supply elements of prescription claims within each patient's measurement period.[16] Health plan adherence rates were calculated by using members' adherence rates while adjusting for length of member enrollment, or member-years. Member-years were calculated as number of months enrolled divided by months eligible in each measurement period. Health plan adherence rates were calculated as the sum of member-years for adherent members divided by the sum of members-years for all members. Validation of methodology and calculations were done by comparing estimated adherence rates with published CMS

TABLE 2 Risk Factors for Nonadherence (PDC < 80%) in Baseline Period

	Diabetes, n = 659		Hypertension, n = 2,005		Cholesterol, n = 1,777	
	Odds Ratio[a]	95% CI	Odds Ratio[a]	95% CI	Odds Ratio[a]	95% CI
Age group (reference: 75+)						
< 54	1.39	0.77-2.58	1.87	1.34-2.61	1.64	1.18-2.27
55-64	1.08	0.59-2.03	1.42	1.01-1.99	1.15	0.82-1.60
65-74	0.80	0.43-1.52	1.26	0.90-1.77	1.17	0.85-1.61
Male (reference: female)	1.07	0.73-1.56	1.06	0.87-1.30	0.95	0.77-1.17
New to therapy (reference: history of therapy)	1.32	0.84-2.07	1.51	1.18-1.93	1.19	0.92-1.55
Number of target medication classes[b] (reference: 3 classes)						
1	3.60	2.13-6.10	1.87	1.38-2.54	0.99	0.74-1.34
2	1.50	1.02-2.22	1.51	1.12-2.03	1.07	0.82-1.40
Comorbidity count[c] (reference: < 4)						
4-6	1.14	0.74-1.67	0.79	0.64-0.98	0.87	0.70-1.09
7+	1.03	0.62-1.71	0.96	0.72-1.27	1.03	0.78-1.37

[a]*Odds ratios estimated using multivariate logistic regression.*
[b]*Number of target medication classes utilized by member (diabetes, hypertension, cholesterol).*
[c]*Comorbidity count estimated by Medicaid Rx.*
CI = confidence interval; PDC = proportion of days covered.

performance measure values for the 2011 calendar year. Estimated adherence rates using our methodology were within one-tenth to a half percentage points of CMS published rates. Differences between our calculated rates and published rates by CMS were most likely due to the CMS adjustment for inpatient hospital stays, which CMS estimates at 0.4-0.6 percentage points,[14] and slight variations in our respective National Drug Code (NDC) medication lists.

Published CMS adherence rates and star ratings for the 2011 and 2012 measurement years were used to assess the impact of the program on the plan's star ratings. These publicly available files obtained from CMS included adherence rates and star ratings for all MA-PD plan contracts.[14] Changes in adherence rates and star ratings between the 2011 and 2012 measurement years for *i*Care were calculated and compared with calculated changes for the national MA-PD plan contract average (the average for all contract types). Furthermore, changes in rates were compared with another dual-eligible SNP that did not implement an adherence intervention in 2012. This comparator plan was selected among MedImpact health plans similar in membership size and demographics (dual-eligible SNP and 100% of members receiving LIS). Lastly, January 2014 Patient Safety Reports published by Acumen were used to assess possible sustained effects of the program on the 2013 measurement period.

To evaluate changes in members' adherence rates postimplementation, prescription claims were used to calculate adherence rates for 9-month pre- and postimplementation periods. Changes in pre-post period rates for each intervention group were compared to assess differences between intervention components (*i*Care-only and *i*Care + US MED). To assess the effectiveness of the member priority file component of the intervention, year-to-date adherence was measured for the health plan for the last 5 months of 2012. Changes in rates from the prior month period (e.g., January to October vs. January to September) were calculated and compared with published national MA-PD plan rates for similar time periods to detect differences in adherence as the measurement period progressed. To assess the refill reminder component of the program, the number of authenticated calls out of the total placed calls was used to calculate member contact rates. Survey response rates were calculated, and the number and percentage of members providing self-reported reasons for not refilling medication were summarized.

Additional Study Measures

Member demographics and health plan enrollment status were ascertained from member eligibility files. Age was determined as of intervention start date. Baseline adherence to each medication class was calculated for the 6-month period prior to the intervention start date (October 1, 2011, to March 31, 2012). Members were classified as naïve to therapy if they had a negative history of a claim for the medication class in this baseline period. Baseline medication use was measured by the number of distinct medications (as determined by generic name). Comorbidities were estimated using members' prescription claims in the calendar year 2012. The First DataBank therapeutic classification system was used to identify specific medication use by NDC number, and comorbid conditions were measured using Medicaid Rx, a pharmacy-based risk adjustment model used to adjust capitated payments for Medicaid health plans.[17] This risk adjuster, which uses NDC numbers to create indicator variables for 45 disease states, was selected due to

TABLE 3 Member Demographics and Adherence Change by Participation Group

	Diabetes			Hypertension			Cholesterol		
	*i*Care-only Enrollees n = 89	*i*Care + US MED Enrollees n = 80	*P* Value	*i*Care-only Enrollees n = 327	*i*Care + US MED Enrollees n = 168	*P* Value	*i*Care-only Enrollees n = 301	*i*Care + US MED Enrollees n = 184	*P* Value
Age, mean	60.3	58.8	0.422	58.7	59.1	0.251	60.4	60.2	0.855
Female, %	66.3	65.0	0.860	58.7	70.8	0.008	59.8	68.5	0.055
Number of comorbid conditions, n	4.7	4.3	0.314	4.3	4.3	0.995	4.6	4.4	0.333
Baseline period PDC, mean	53.9	54.8	0.709	59.6	60.2	0.649	60.0	58.1	0.956
Postperiod PDC, mean	69.1	85.8	<0.001	69.7	85.7	<0.001	71.6	87.5	<0.001
Unadjusted PDC change (pre-post), mean	15.1	30.9	<0.001	10.1	25.5	<0.001	13.6	29.4	<0.001
Adjusted mean difference in postperiod PDC[a]	**17.4**		<0.001	**15.6**		<0.001	**16.3**		<0.001

[a]Difference in postperiod adherence between iCare-only versus iCare + US MED member groups. Adjusted for baseline adherence, age, gender, and comorbidity. P values for adjusted mean difference in postperiod PDC were estimated by analysis of covariance. P values for age, gender, baseline period PDC, and postperiod PDC were determined by individual sample t-tests.

iCare = Independent Care Health Plan; PDC = proportion of days covered.

the nature of the dual-eligible study population. The provider specialty of the prescriber for each member was determined by the prescriber's first-listed specialty, using the Health Market Science Prescriber MasterFile.

Statistical Analysis

Descriptive statistics for all independent and outcome variables were tabulated for the total intervention population and stratified by medication class. Multivariate logistic regression was used to identify risk factors for nonadherence in the baseline period by modeling the probability of a member being nonadherent (dependent variable) in the 6 months before the intervention start date. The cut point used by CMS, PDC ≥ 80%, was used to categorize members as adherent or nonadherent. Independent variables included age group, gender, new to therapy, number of target medication classes used, and number of comorbid conditions (based on the Medicaid Rx categories). For the member-level pre-post intervention assessment, analysis of covariance (ANCOVA)[18,19] was used to compare mean pre-post differences in adherence rates between participant groups while controlling for baseline adherence and members' age, gender, and comorbidity. Interactions and correlation diagnostics were assessed in the final models. A 0.05 (two-tail) level of significance was used to determine covariate significance. All analyses were conducted by medication class to understand potential adherence differences between medication classes. To assess the influence of the intervention on the overall health plan population performance, differences in adherence rates and star ratings from 2011 to 2012 measurement years were calculated for the health plan and compared with differences calculated for the MA-PD plan contract average and the comparator health plan. All analyses were performed using SAS, version 9.3 (SAS Institute Inc., Cary, NC).

Results

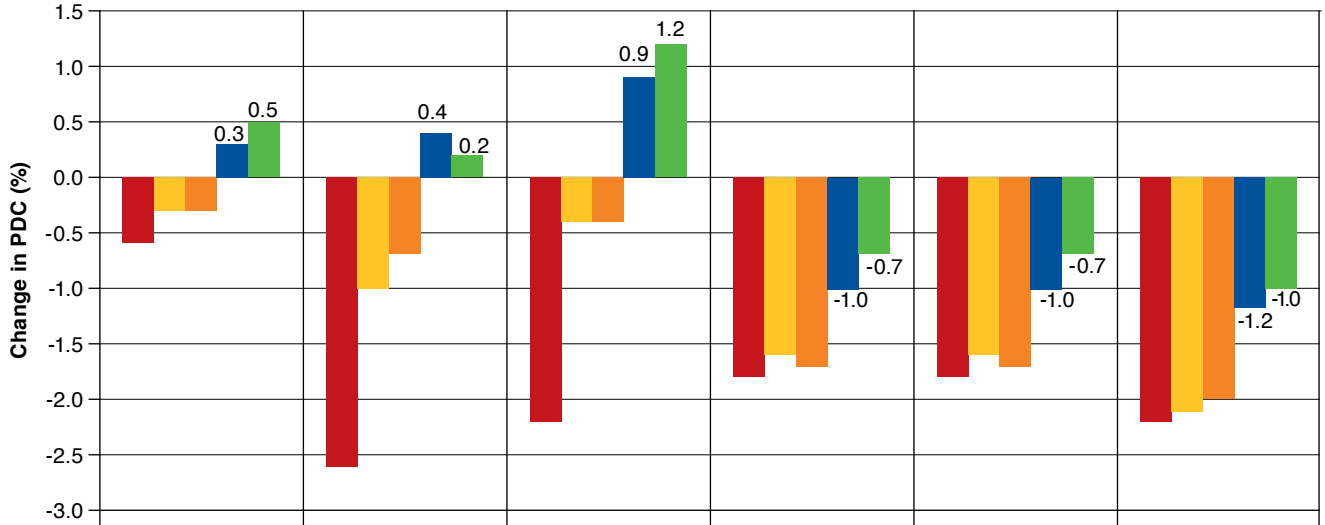
Patient Identification and Enrollment

An initial cohort of 2,700 members was identified for intervention in April 2012 (Figure 1). Subsequent monthly analyses of prescription claims identified an average 2,763 members per month that represented a total of 3,429 distinct members identified for intervention during the 2012 calendar year. By January 2013, 845 (31.3%) of the initial cohort and 1,302 (38.0%) of the total identified members enrolled in the US MED program component (*i*Care + US MED group). The remaining members, 1,855 (68.7%) of the initial cohort (2,700 members), were enrolled in the *i*Care-only group. One hundred and thirty members of the total *i*Care-US MED enrollees chose to opt out of the US MED component. Members opting out of the program were not different than participating members with respect to age, gender, number of comorbidities, and baseline adherence. Out of 1,400 surveys mailed to members who enrolled in the US MED component, 233 (16.6%) were returned. A large majority of responders indicated overall satisfaction (84% very satisfied), likely to use the pharmacy in the future (87%), and likely to refer US MED to family and friends (72.2%).

Member Characteristics and Risk Factors for Poor Adherence

Of the 2,700 distinct members initially identified for intervention, a respective 659, 2,005, and 1,777 members were identified by the 3 medication classes: medications for oral diabetes (ODM), medications for hypertension (HTN), and medications for cholesterol (CHOL; Table 1). Members identified for intervention by more than 1 medication class were advised on adherence to all targeted medication classes. The number and percentage of nonadherent members at baseline by class were 186 (28.2%), 630 (31.4%), and 622 (35.0%), respectively, for ODM, HTN and CHOL. Fifty-two percent of members utilized

FIGURE 2 Change in Year-to-Date Adherence Rates for Last 5 Months of 2012 Measurement Period



	*i*Care Diabetes (%)	*i*Care Hypertension (%)	*i*Care Cholesterol (%)	MA-PD Average Diabetes (%)	MA-PD Average Hypertension (%)	MA-PD Average Cholesterol (%)
August	-0.6	-2.6	-2.2	-1.8	-1.8	-2.2
September	-0.3	-1.0	-0.4	-1.6	-1.6	-2.1
October	-0.3	-0.7	-0.4	-1.7	-1.7	-2.0
November	0.3	0.4	0.9	-1.0	-1.0	-1.2
December	0.5	0.2	1.2	-0.7	-0.7	-1.0

iCare = Independent Care Health Plan; MA-PD = Medicare Advantage prescription drug plan; PDC = proportion of days covered.

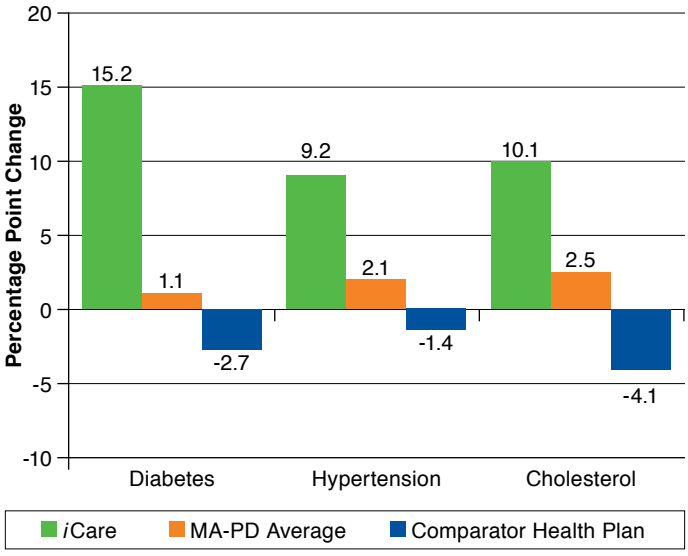
more than 1 class (e.g., prescription claims for ODM and HTN), and 72.6% of members were nonadherent to 1 or more of the target medication classes. The intervention study population was 67.0% female, and the average member age was 60.5 years. The proportion of members new to therapy ranged from 17.8% for ODM to 20.1% for CHOL. The most common comorbidity outside of the target medication classes was pain management (ranging from 66.6% to 70.6%). The proportion of members filling medications to treat asthma or chronic obstructive pulmonary disease ranged from 42.1% to 43.7%. Characteristics of members identified for intervention during subsequent monthly identification were similar to the initial cohort.

Table 2 provides results of logistic regression identifying risk factors associated with nonadherence in the baseline period. Risk factors were similar by medication class. Overall, younger members were more likely to be nonadherent. Compared with members aged 75 years and older, members aged less than 54 years were 1.39 (95% confidence interval [CI] = 0.77-2.58), 1.87 (95% CI = 1.34-2.61), and 1.64 (95% CI = 1.18-2.27) times more likely to be nonadherent to ODM, HTN, and CHOL, respectively. Members new to antihypertensive therapy had increased odds of nonadherence (odds ratio [OR] = 1.51, 95% CI = 1.18-1.93). The factor most associated with nonadherence was number of target medication classes. Members identified for intervention by only 1 of the 3 target classes were 3.6 times more likely to be nonadherent to ODM (OR = 3.60, 95% CI = 2.13-6.10) and 1.8 times more likely to be nonadherent to HTN (OR = 1.87, 95% CI = 1.38-2.54), compared with members identified by all 3 measures. No association between number of target medication classes used and adherence was found in the CHOL group. Associations between comorbidity and nonadherence were mixed. Increased comorbidity was slightly associated with nonadherence for members identified by ODM, but indicated decreased risk among members identified by HTN.

Adherence Rates and Star Ratings

Adherence increased for both intervention groups postimplementation. The *i*Care-only group increased 15.1, 10.1, and 13.6 percentage points, respectively, for the ODM, HTN, and CHOL measures in the 9-month postperiod (Table 3). The

FIGURE 3 Percentage Point Change in Adherence Rates from 2011 to 2012 Measurement Periods



iCare = Independent Care Health Plan; MA-PD = Medicare Advantage prescription drug plan.

average change in adherence for the *i*Care + US MED group was a respective 30.9, 25.5, and 29.4 percentage points for ODM, HTN, and CHOL. The adjusted change in adherence rates for *i*Care + US MED enrollees were significantly greater than *i*Care-only enrollees for each measure. Adjusting for age, gender, comorbidity, and baseline adherence, absolute postperiod PDC differences between means for *i*Care + US MED enrollees compared with *i*Care-only enrollees was +17.4 ($P < 0.001$), +15.6 ($P < 0.001$), and +16.3 ($P < 0.001$) for ODM, HTN, and CHOL, respectively. The proportion of members reaching the adherence threshold (PDC ≥ 80%) for ODM, HTN, and CHOL increased for *i*Care in the postperiod was a respective 49.7%, 49.3%, and 57.3% (data not shown). These rates were greater than those observed with the comparator group in the same 9-month time period: 38.9%, 46.4%, and 41.4%.

Plan adherence rates increased for all 3 measures in the 2 months after the member priority list implementation in November 2012. For the CHOL measure, health plan year-to-date adherence rates increased 0.9 and 1.2 percentage points during November and December, compared with a decrease of 1.2 and 1.0 percentage points for the national MA-PD plan contract average for the same time periods (Figure 2). This trend was also observed for ODM and HTN; health plan adherence rates increased 0.3 and 0.5 percentage points for ODM, where the MA-PD plan contract average decreased 1.0 and 0.7 percentage points, and for HTN, health plan adherence rates increased 0.4 and 0.2 percentage points, where the MA-PD plan contract average decreased 1.0 and 0.7 percentage points.

Comparing the CMS-published adherence rates and star ratings for the 2011 and 2012 measurement periods, *i*Care's adherence rates increased 15.2, 9.2, and 10.1 percentage points for the ODM, HTN, and CHOL measures, respectively, from 2011 to 2012 (Figure 3). Plan adherence rate increases were considerably higher for *i*Care compared with average MA-PD plan contract rate changes (1.1%, 2.1%, 2.5%) and the comparator health plan (-2.7%, -1.4%, -4.1%). Final adherence rates and star ratings for the 2012 measurement period (2014 star ratings) for *i*Care were 72.5% (3 stars), 68.5% (2 stars), and 68.4% (3 stars) for the ODM, HTN, and CHOL measures, respectively (Figure 4). Adherence rates continued to improve during the 2013 measurement period. Through November 2013, *i*Care rates were 3.4, 1.2, and 2.7 percentage points greater than the same 11-month period in 2012 (data not shown).

IVR Refill Reminder Component

From January 9, 2013 (IVR implementation date) to August 23, 2013, a total of 4,767 distinct late refill instances (member-drug combinations) were identified (results not shown). Approximately 1,278 (26.8%) of instances were authenticated by members. Among these members that authenticated and responded to individual questions, 1,207 (94%) responded "yes" to the question "Do you plan to refill your medication?". For the 129 members that responded "no" to this question, 99 members provided a response. The most common response of the 5 choices was "Doctor recommended stopping the medication" (45.5%), followed by "Don't believe you need it" (26.3%), "Problems with side effects" (15.2%), "Cost of medications keeps you from refilling medication" (8.1%), and "Did not understand doctor's instructions on how to take their medication" (5.1%). Of 1,036 members, 949 (91.6%) responded "yes" to the concluding survey question "Was the call helpful?".

Discussion

Evaluation of this innovative adherence program found that member and health plan adherence rates to all 3 medication classes increased significantly after program implementation. Changes in health plan adherence rates from 2011 to 2012, which approximates the pre-post program implementation periods, were much higher for *i*Care as compared with changes observed with the national MA-PD plan contract average and a comparable dual-eligible special needs plan. The pre-post member-level analysis found increased adherence postimplementation for all 3 medication classes for both participation groups (*i*Care-only and *i*Care + US MED), with greater increases observed for members participating in the *i*Care+US MED component after adjusting for patient demographics, comorbidity, and baseline adherence. Findings from our assessment

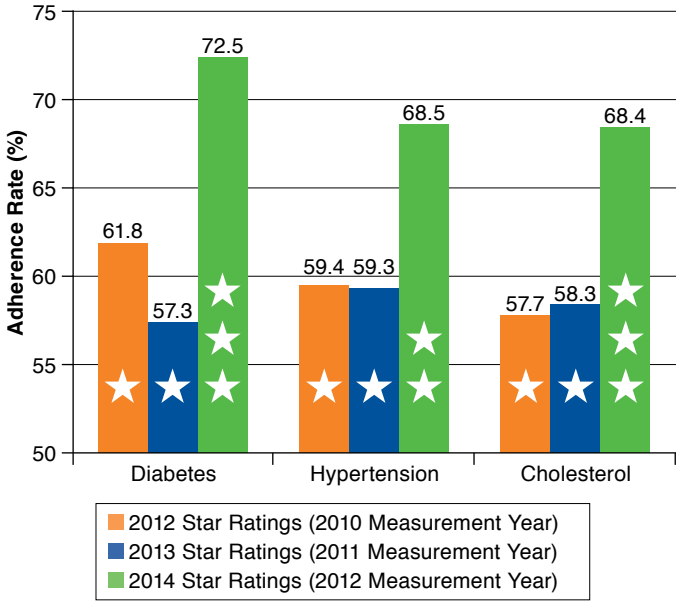
are particularly meaningful given that this intervention was conducted on a dual-eligible, LIS population that previously proved to be difficult to contact and engage.

Our results of intervention effectiveness are greater than available findings of interventions directed at these therapeutic classes; however, nearly all published interventions are clinical trials conducted in small, controlled study populations for short durations (3 to 6 months).[1,9,11] The objective of this intervention was to improve adherence over longer periods of time—a more appropriate goal given the chronic prognosis of diabetes, hypertension, and hyperlipidemia. With the introduction of the CMS star ratings program and national campaigns promoting adherence,[2-4] many health plans have employed adherence interventions to improve quality of care and adherence rates. Therefore, we used the national MA-PD plan contract average and a health plan similar in member characteristics as adequate comparators in our assessment of effect size. The national MA-PD plan contract average includes a mix of health plans that likely perform a variety of adherence interventions. Our results are similar in direction to studies describing multicomponent approaches as more effective than a single approach in changing medication adherence behavior. Jing et al. (2011) found that messaging providers and patients was effective at improving antihypertensive and antidiabetic adherence in a Medicare population.[20]

The rapid enrollment of members in the first few months after implementation demonstrated the effectiveness of the enrollment process into the *i*Care+US MED program component. By January 2013, 38% (1,302) of 3,429 referred members enrolled in the *i*Care+US MED program. The low disenrollment rate, 8.7% (113 of 1,302 enrolled members), suggests that the intervention was effective at maintaining member care. The convenience of medication delivery is a likely reason for initial and sustained enrollment in the *i*Care+US MED component. Monthly member and pharmacy claims data files supplied the care management team with visibility to specific member adherence issues. The web-based application allowed both US MED and *i*Care personnel to update member information to sustain enrollment in the intervention and also allowed fast communication that facilitated member engagement.

We expected that members with higher baseline adherence rates would be more likely to participate in the US MED component and therefore thought members would self-select into the *i*Care+US MED group; however, we observed similar baseline adherence for both *i*Care+US MED and *i*Care-only members. We also anticipated *i*Care+US MED enrollees to demonstrate greater adherence improvements in the postperiod because they received continual medication supply via mail and were counseled by the care management team of *i*Care and the pharmacy service teams from US MED, in contrast with the *i*Care-only members, who received counseling from only the *i*Care team. After implementation, the *i*Care+US MED group did demonstrate significantly greater improvements compared with *i*Care-only enrollees, but both groups experienced meaningful improvements that subsequently increased *i*Care's adherence rates.

FIGURE 4 *i*Care Adherence Rates and Star Ratings[a] by Year and Measure



[a]*CMS started rounding to whole numbers with 2014 star ratings.*
CMS = Centers for Medicare &Medicaid; iCare = Independent Care Health Plan.

The increased adherence rates gained during the 2012 measurement year translated into higher star ratings for all measures targeted by the intervention. *i*Care's performance ratings went from 1 to 3 stars for the ODM and CHOL measures and 1 to 2 stars for the HTN measure. The adherence rates for *i*Care had a significant net relative increase compared with the national MA-PD plan contract average, which observed a slight improvement, and the comparator health plan, which observed a slight decline in adherence. Increases in the adherence measures for each of the 3 medication classes provided an additional impact to *i*Care's overall Part D star rating by increasing the Drug Plan Quality Improvement measure from 2 stars to 4 stars. Overall, *i*Care's Part D star rating increased from 3 to 3.5 stars from the 2013 star ratings (calendar year 2011 measurement period) to the 2014 star rating (calendar year 2012 measurement period). Furthermore, adherence rates reported for the 2013 measurement year are higher than 2012, demonstrating positive sustained effects of the program.

The value of increased star ratings to health plans include incentive payments (i.e., quality bonus payments and greater

rebate percentage), as well as increased membership through exposure to publicly reported ratings on Medicare Plan Finder, the CMS website available to members to compare health plans. A recent study evaluating the association between star ratings and enrollment decisions quantified the average value of increased ratings. Reid et al. (2013) found that an increase in 1 star was associated with a 9.5% increased likelihood to enroll new enrollees.[21] Among members switching plans, for every 1-star increase there was a 4.4% increased likelihood to enroll. For MA-PD plans with consecutive low star ratings, increases in performance ratings will prevent a "Low Performing Icon" (LPI). In 2011, CMS began labeling plans with the LPI on the Medicare Plan Finder website, if consecutive plan performance was less than 3 stars for either the Part D or Part C rating for the last 3 measurement years.

MA-PD plans continue to search for novel approaches to increasing appropriate and persistent use of medications. Our study demonstrated an effective collaboration between an MA-PD plan, a pharmacy benefit manager, and a pharmacy to engage members in an adherence intervention. The increased adherence rates observed in our study may be due to the ability of care coordinators to address some of these barriers by (a) improving medication access, (b) counseling members on when to take medication, and (c) scheduling provider visits. The large proportion (31%) of members electing the mail order option suggests that members of this dual-eligible population may have had difficulty with medication access that could be resolved with this convenience. Although mail order does not completely ensure full consumption of medications, members with limited access to pharmacies may have benefited from ongoing medication delivered to their homes. We believe this home delivery benefit, which was restricted to a 30-day supply (considerably less than most mail-based 90-day fill programs), outweighs the potential waste and mismanagement of these medications because there is low potential for abuse of medications in these classes.

Limitations

We acknowledge the following limitations to our evaluation. First, we recognize actual adherence may differ from our estimated adherence rates that used administrative pharmacy claims data. Although this is a limitation of the measurement method, the PDC methodology is the selected method used by CMS in Part D performance ratings and was used consistently for all intervention groups and comparators. The use of pharmacy claims as an estimate of adherence to maintenance medications has been well validated in integrated health systems.[22,23]

In the case that actual adherence is lower than our estimated adherence, associations between the intervention and adherence may be overestimated. Additionally, members may have appropriately discontinued therapy per provider recommendations due to medication side effects or changes in disease status. Data from the IVR intervention component were leveraged to identify members reporting side effects and lack of understanding of medication regimens. Members self-reporting medication side effects or those reporting trouble with provider instructions were called by *i*Care nurses. These members were included in our analysis and therefore may be falsely classified as nonadherent, which would lead to a biased underestimation of the effectiveness of the intervention. Conversely, members may have received medication from other sources (e.g., samples or family members). These members may be falsely identified as nonadherent if the member is taking medication as prescribed. These limitations would apply similarly to the intervention and comparator group and are not felt to substantially influence the results observed.

Second, in our member subanalysis that compared member participation groups, we understand that *i*Care+US MED enrollees received medication by mail, which provides a convenience advantage over members who obtain medications at retail pharmacies. Mail delivery of medication ensures close-to-full medication coverage as measured by the PDC method; therefore, estimated adherence rates for *i*Care+US MED enrollees were expected to be greater than *i*Care-only enrollees. We did find adherence improvement for both groups, which substantiated the overall effectiveness of the program. Additionally, adherent members may exhibit better overall health behavior patterns,[24] which may bias results in favor of 1 of the participation groups. Given the unavailability of an overall measure of one's health behavior, we addressed this potential participation bias by accounting for member characteristics, baseline adherence, and pharmacy utilization in the modeling stage of the analysis.

Third, this intervention was implemented within a single health plan and may not be representative of other MA-PD plan experiences. However, our findings of positive effectiveness are consistent with evaluations of hypertension and diabetes adherence interventions in Medicare populations.[20] The intervention population consisted of dual-eligible members who have more comorbid conditions and more complex medication regimens than non-SNP MA-PD plans.[25] Application of this intervention in non-SNP populations may provide equal or greater effectiveness.

Fourth, communications between members and *i*Care care coordinators would have allowed better evaluation of the effectiveness of the entire program. Data on time and frequency of member contact by care management staff were not available, which limited any detailed comparison of differential program component effects.

Conclusions

Members in this Medicare special needs population benefited from an integrated communication program aimed to increase medication adherence to treat 3 highly prevalent disease conditions. The large, positive increases in medication adherence for the 3 targeted classes postimplementation are substantial because of the study population's previous poor adherence record and relative improvements compared with the national MA-PD plan contract benchmark and a comparator plan that did not implement an adherence intervention. Adherence rates continued to improve in the 2013 measurement year, indicating continuing effectiveness of the intervention. Health plans, including their pharmacy and care management teams, can effectively utilize pharmacy benefit managers and pharmacy partners to offer novel methods to improve member and overall health plan medication adherence.

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DISCLOSURES

No funding was received in return for conducting this research. Portions of this work were presented as podium (PB#1) and poster presentations (PRR#35) at the Academy of Managed Care Pharmacy 25th Annual Meeting & Expo in San Diego, California, April 3-5, 2013. Leslie, Patel, and Rein are employees of MedImpact Healthcare Systems, Inc. Tirado was the Pharmacy Director at Independent Care Health Plan at the time of the intervention and analysis.

Study concept and design were contributed by Leslie and Patel. Data were collected by Leslie. Data analysis was conducted by Leslie. Manuscript was written by Leslie and revised by all authors.

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