Effect of Patient Notification of Formulary Change on Formulary Adherence

THOMAS DELATE, PhD, and ROCHELLE HENDERSON, MPA

ABSTRACT

OBJECTIVE: To evaluate the impact of patient notification of impending formulary changes on formulary adherence.

METHODS: This pilot program in a large, Midwest-based health insurer utilized a randomized controlled trial research design. A list of 30 chronic-use medications that were to change formulary status were selected for the pilot. A review of adjudicated pharmacy claims records was performed to identify patients receiving one or more of the formulary change medications on the list. Members of 112 individual health plans of this large health insurer, all of whom were subject to the same drug formulary, were randomized to either the intervention (letter) or control arm. Patients in the intervention arm were sent a targeted communication that described the patient's formulary change medication(s) and provided therapeutic option(s) for the formulary change medication(s). Pharmacy claims for patients in both arms were examined at 110 days after the date of the mailing to determine if there was a switch to a formulary alternative. Multivariate regression modeling was performed to adjust for baseline differences between the arms.

RESULTS: A total of 7,247 unique formulary change medication regimens were identified (3,817 in the control arm and 3,430 in the letter arm) for 6,518 subjects (3,387 in the control arm and 3,131 in the letter arm). A higher proportion of formulary change medication regimens in the intervention arm were switched to a formulary alternative compared with the control arm (19.2% vs. 12.0%, $P<0.001$). After adjustment for baseline differences, regression modeling indicated that subjects in the intervention arm were 1.33 times more likely to switch to a formulary alternative ($P<0.001$).

CONCLUSION: A letter-based, formulary change notification program is a pragmatic and effective strategy to increase drug formulary adherence. Such a program does not restrict access to medications but, rather, provides education and personalized information that may allow patients to participate more actively in their pharmacotherapy decision making.

KEYWORDS: Formulary adherence, Pharmacy benefit manager, Randomized controlled trial, Communication

J Manag Care Pharm. 2005;11(6):493-98

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Formulary management is an important component used in the management of the pharmacy benefit. Formularies are used to promote appropriate pharmacotherapy for improving or maintaining health while encouraging the use of the most cost-effective medications.[1,2] By limiting medication selection among therapeutically similar agents and optimizing volume discounts or rebates, formularies enhance a health plan's ability to achieve cost savings.[3] Open formularies offer access to most medications but can be employed to incentivize patients to use formulary agents (i.e., generic and preferred brands) by tiering patient copayments based on a generic (first tier), formulary brand (second tier), and nonformulary brand (third tier) schema (i.e., a 3-tier benefit design).[4]

Formularies are often updated based on new agents (generic and brand) entering the market, contemporary assessments of an agent's effectiveness, and renegotiations with manufacturers or wholesalers of pricing and/or rebates.[5] Patients experiencing change with their prescribed medication after a formulary update (e.g., their prescribed medication moved from the second to the third tier) may switch to a formulary generic or brand agent, pay the increased copay amount for the nonformulary agent, or discontinue refilling their medication.[6] Unfortunately, the available evidence suggests that relatively few patients switch to a formulary agent (i.e., formulary adherence) with a lower copayment after a formulary update.[4]

While health plans and/or their pharmacy benefit manager (PBM) may expend considerable resources attempting to communicate formulary information to prescribers, medication benefit communications between plan sponsors and their beneficiaries appear to be limited.[7] It has been suggested that one factor that limits formulary adherence is an information gap regarding the therapeutic options that patients have in an open formulary.[8] Closing this gap could allow for patients' increased participation in clinical decisions with their prescriber and lead to increased formulary adherence and lower patient out-of-pocket (OOP) costs.[9]

One strategy for informing members is a targeted mailing to notify patients of impending formulary change.[10] However, no systematic evaluation of the effect of such a communication strategy on formulary adherence has been reported in the peer-reviewed literature. Thus, the purpose of this study was to evaluate the impact of patient notification of impending formulary change(s) on formulary adherence.

TABLE 1 Number of Claims and Generic Name of Changed Medications* by Study Arm

Changed Medication	Study Arm: Letter (n = 3,430)	Study Arm: Control (n = 3,817)
Albuterol (inhalation)	10	4
Adalpalene	51	51
Almotriptan	20	36
Azatadine and pseudoephedrine	0	1
Bimatoprost (ophthalmic)	31	29
Budesonide (inhalation)	38	36
Calcitonin [salmon] (nasal)	40	39
Candesartan	103	109
Candesartan HCTZ	50	60
Celecoxib	775	941
Estradiol (patch)	33	21
Estradiol-dot (patch)	100	127
Estradiol-dis (patch)	22	18
Felodipine	48	42
Ketorolac tromethamine	28	29
Ketorolac tromethamine (topical)	0	1
Metformin	317	348
Metformin 750 mg	9	17
Nedocromil (inhaler)	6	12
Nisoldipine	20	23
Omeprazole	150	148
Pravastatin	615	577
Quinapril	355	379
Quinapril HCTZ	20	37
Trentinoin gel (topical)	3	1
Trentinoin liquid (topical)	0	2
Trentinoin micro (topical)	33	36
Valdecoxib	475	603
Verapamil	41	47
Zafirlukast	36	44

** All medications were the branded product and an oral formulation unless otherwise noted.*

Methods

Population

A Midwest-based health insurer partnered with a PBM to pilot test a formulary change notification letter program. This health insurer administered a variety of health plans, including preferred provider organization and health maintenance organization plan designs. The inclusion criteria for this study were: health insurer members who had the same formulary (the PBM's national preferred formulary), a 3-tier benefit design, and who experienced the same formulary changes as of January 1, 2004. Health plans were excluded if there were no members in the plan or the plan terminated from the health insurer prior to the mailing of the intervention. Thirty of the approximately 150 medications that were to change from formulary to nonformulary status (i.e., change from the second-tier copayment to the third-tier copayment in a 3-tier benefit design) were selected for the study based on their chronic use for other than mental health indications[11] and sufficient utilization (i.e., >5 claims per month based on the health insurer's previous year's utilization) (Table 1). A total of 45 medications were made available to the members as formulary brand (i.e., second-tier copayment) and generic (i.e., first-tier copayment) alternatives to the 30 medications that were to change formulary status to the higher, third-tier copayment (list is available from the authors). The research was performed under the principles outlined in the Declaration of Helsinki and the regulations of the recently approved Health Insurance Portability and Accountability Act (HIPAA) regarding use of personal health information for program evaluation.

Research Design

To reflect real-world pharmacy benefit coverage where beneficiaries may terminate plan coverage at any time throughout the year, this pilot was designed as a randomized controlled trial without assurance of continuous coverage (i.e., continuous eligibility was not an inclusion criterion of the study). Health plans using the national preferred formulary that were to experience a formulary change were randomized either to an arm receiving a targeted communication (letter arm) or receiving no communication (control arm). Randomization was performed using the method of randomly permuted blocks.[12] Members in the randomized health plans who had at least one claim for one or more of the targeted changed medications in September, October, or November 2003 were identified.

Intervention

The intervention was a targeted, patient-oriented communication cobranded with the corporate logos of the health insurer and the PBM. The intervention included text that described the member's changed (nonformulary) medication(s), the therapeutic option(s) to the changed medication, information highlighting the potential to lower member OOP costs if the nonformulary drug was switched to a formulary product, and instructions to speak with the prescriber about switching to the formulary product. Health plans that were randomized to receive the communication were sent the intervention letter during the first week of December 2003. This time period was chosen so as to provide intervened members an opportunity to request from their prescriber(s) a switch to the formulary agent(s) prior to the January 1, 2004, formulary change implementation.

No other communications related to the formulary changes were sent to the members enrolled in the study.

Outcomes

Pharmacy claims were examined for 110 days after the mailing of the intervention letter and assessed at the individual drug product level for subjects (1) receiving a formulary alternative (switching) drug, (2) remaining on the changed (nonformulary) drug, (3) receiving a formulary alternative drug then switching back to the changed (nonformulary) drug, and (4) having no claim for the formulary alternative or change (nonformulary) drug. Differences in proportions of each of these outcomes were assessed between the study arms. Changed medications with >200 targeted claims were examined at the individual product level to assess switching proportions.

Analysis

Subject characteristics were reported as proportions, means, and standard deviations. Chi-square tests of association were performed when comparing proportions between study arms. Independent sample *t* tests were performed when comparing means between study arms. Multivariate logistic regression was performed to regress the study arm on the outcome of receiving a formulary alternative while controlling for age in years, gender, continuous eligibility, number of targeted medications per subject, receiving changed medication from mail-order pharmacy, mail and community formulary brand copayments (other copayments were highly correlated [$\rho > 0.80$] with these values and, thus, excluded from the model), and an interaction of the product of having received changed medication from mail-order pharmacy and the study arm. Sensitivity analyses were conducted to determine outcomes excluding subjects with no claims for formulary alternative or changed product in the 2004 postperiod and among subjects with continuous eligibility. The alpha level was set at 0.05.

Results

A total of 61 and 58 individual health plans were randomized to the control and letter arms, respectively. One health plan was removed from the control arm because there were no members in the health plan, and 6 health plans were removed from the letter arm because either they had no members in the health plan or the health plan had been terminated from the health insurer prior to the mailing of the intervention. There were a total of 7,247 unique changed medication regimens identified (3,817 in the control arm and 3,430 in the letter arm) for 6,518 subjects (3,387 in the control arm and 3,131 in the letter arm). Subjects in the control arm were, on average, slightly younger and less likely to have received their changed medication from mail-order pharmacy and had fewer changed medications per subject and lower copayments than subjects in the letter arm (Table 2).

TABLE 2 Baseline Demographic and Copayment Characteristics of Subjects by Study Arm

Characteristic*	Study Arm: Letter (n = 3,131)	Study Arm: Control (n = 3,387)	*P* Value
Female (%)	55.8	54.3	0.361
Age (mean in years)	52.1	49.3	< 0.001
Community generic copayment ($ mean)	10.23	9.54	< 0.001
Community formulary brand copayment ($ mean)	20.48	19.14	< 0.001
Community nonformulary brand copayment ($ mean)	33.97	34.03	0.893
Mail generic copayment ($ mean)	29.58	26.33	< 0.001
Mail formulary brand copayment ($ mean)	58.49	51.85	< 0.001
Mail nonformulary brand copayment ($ mean)	99.89	90.76	< 0.001
Receiving changed medication from mail order Pharmacy (%)	26.9	21.8	< 0.001
Count of changed medications per subject (mean)	1.2	1.1	0.023
Continuously eligible (%)	72.2	71.0	0.254

** At the individual subject level as of March 30, 2004.*

TABLE 3 Unadjusted Formulary Adherence Outcomes 110 Days Postintervention

Outcome*	Study Arm (%): Letter (n = 3,430)	Study Arm (%): Control (n = 3,817)	*P* Value
No claim	47.2	45.2	0.120
Switched to formulary agent	19.2	12.0	< 0.001
Switched then returned to changed agent	0.5	0.5	0.951
Remained on changed agent	33.1	42.3	< 0.001

** At the individual targeted regimen level.*

Subjects in the letter arm were more likely to have switched to a formulary drug than subjects in the control arm (19.2% vs. 12.0% unadjusted, $P < 0.001$) (Table 3). Sensitivity analyses revealed that the proportion of subjects switching to a formulary alternative was higher in the letter arm when excluding subjects with no claim for a formulary alternative or changed product in the 2004 postperiod (letter = 36.3% vs. control = 21.8%, $P < 0.001$) and among subjects with continuous eligibility (letter = 24.2% vs. control = 14.7%, $P < 0.001$). There was no difference between

TABLE 4 Results of Multivariate Logistic Regression Modeling of Switching to a Formulary Agent

Predictor	β-Coefficient	*P* Value	Odds Ratio
Study arm (letter)	0.282	<0.001	1.33
Gender (female)	0.148	0.027	1.16
Age*	0.014	<0.001	1.01
Continuously eligible	1.185	<0.001	3.27
Community formulary brand copayment	-0.011	0.092	0.99
Mail formulary brand copayment	0.004	<0.001	1.00
Receiving changed medication from mail-order pharmacy	-0.303	0.019	0.74
Count of changed medications	0.072	0.263	1.08
Interaction of receiving changed medication from mail-order pharmacy and study arm (letter)	0.660	<0.001	1.94

** As of March 30, 2004.*

the arms in the proportions of changed medications that were not refilled and switched medications that were switched back to nonformulary products. In the letter arm, mail users were more likely to have switched to a formulary drug than community users (20.4% vs. 18.6%, $P = 0.040$); while in the control arm, community users were more likely to have switched to a formulary product than mail users (13.3% vs. 8.6%, $P<0.001$).

Multivariate regression analysis adjusting for baseline differences indicated that letter arm subjects were 1.33 times more likely to have switched to a formulary alternative compared with control subjects ($P<0.001$) (Table 4). Predictors of switching were (1) female gender, (2) older age in years, (3) continuous eligibility, (4) higher mail-order formulary brand copay, and (5) receipt of a changed medication from a community pharmacy. The interaction term of the product of receiving a changed medication from mail-order pharmacy and the study arm was also significant ($P>0.001$). This finding indicates that, when all other characteristics are equivalent, a subject in the letter arm who had received his or her changed medication from mail-order pharmacy had an increased likelihood of switching to a formulary alternative compared with a subject in the letter arm who received his or her changed medication from community pharmacy.

Of the changed medications with > 200 targeted claims (Table 1), subjects in the letter arm were more likely to switch to a formulary alternative compared with subjects in the control arm from candesartan (34.9% vs. 4.8%, $P < 0.001$), celecoxib (25.6% vs. 8.4%, $P < 0.001$), omeprazole (41.8% vs. 25.6%, $P = 0.039$), pravastatin (40.9% vs. 19.2%, $P<0.001$), quinapril (30.6% vs. 16.7%, $P < 0.001$), and valdecoxib (24.1% vs. 11.4%, $P=0.001$) (denominators exclude subjects with no claim for a formulary alternative or changed product in the 2004 post-period). Neither arm was more likely to switch to a formulary alternative from metformin (letter = 80.3% vs. control = 81.7%, $P = 0.734$) and estradiol dot (letter = 18.3% vs. control = 8.8%, $P = 0.094$).

Discussion

This study utilized an experimental design with adequate follow-up to allow community and mail-order pharmacy claims to be captured to evaluate a letter-based, patient-centered formulary change notification program. We found that sending a personalized letter to an affected member increased formulary adherence by 60% compared with members who did not receive such a mailing (19.2% in the letter arm vs. 12.0% in the control arm). When adjusting for differences in baseline characteristics between the study arms, we found that sending a personalized letter to an affected member increased formulary adherence by approximately 33% (the odds ratio from the logistic regression was 1.33; thus, there was a 33% increase in formulary adherence for the intervention group) compared with members who did not receive such a mailing.

We identified individual medications that were most likely to be switched to a formulary product after change (increase) in copayment tier. We found conflicting results among 2 products with an available generic formulary alternative (i.e., metformin and omeprazole). Subjects in the letter arm experienced increased and equivalent formulary adherence with omeprazole and metformin, respectively, compared with subjects in the control arm. This phenomenon may be related to direct-to-consumer advertising for proton pump inhibitors (i.e., omeprazole [Prilosec]) being more heavily marketed to consumers than biguanides (i.e., metformin [Glucophage]) and, thus, a higher level of brand loyalty among omeprazole-using subjects.[13]

In addition to identifying a notification letter's effect on formulary adherence, we identified predictors of formulary adherence. Predictors of formulary adherence in this study included OOP cost (copayment), older age, female gender,[4,14] continuous eligibility,[2] and receipt of the changed (nonformulary) medication in the community pharmacy (e.g., patients had an opportunity to discuss face-to-face with their pharmacist why their medication copayment increased). Intriguingly, we identified a strong predictor of formulary adherence in the interaction of being sent a notification letter and having had received the changed medication from mail-order pharmacy. This phenomenon may be related to customer service and/or mail-order pharmacy staff providing these subjects with an additional awareness of their therapeutic options when they called in to have their changed medication(s) refilled, but we did not measure this effect.

To our knowledge, this is the first study reported in the peer-reviewed literature to perform a systematic evaluation of a patient-oriented notification of formulary change (tier-copay-

ment increase). However, one study that examined the effect of a patient-centered letter on medication utilization was reported by Cormack and colleagues.[15] These researchers conducted a randomized controlled trial to educate patients on the problems associated with the long-term use of benzodiazepines. Similar to our study, Cormack and colleagues included in their letter information on therapeutic options and instructions to speak with their prescriber about their medication and found that their letter-based program had a positive effect on directing medication utilization compared with a control group.[15]

Success of letter-based notification may be attributable to the letter providing patients with an awareness of the existence of medication management strategies,[8] practical knowledge about their therapeutic options and cost impact,[16] and an impression of empowerment that spurs them to participate in their pharmacotherapy decision making.[9] Since it has been shown that most patients are not certain of the existence of formularies in their health plan,[17] a notification letter may simply confirm the existence of a formulary and allow patients the opportunity to reflect on their medication utilization with a more thorough knowledge of the clinical and economic options for their prescribed therapy.

Nevertheless, we found that approximately 33.1% of the subjects in the letter arm remained on a product that changed to nonformulary (higher copayment) status, compared with 42.3% in the control group that remained on the higher copayment (nonformulary) drug. This phenomenon may be related to the subsequent unwillingness of patients to switch medications based on the efficacy they have experienced with their (now) nonformulary medication. Supplementing the patient-oriented intervention with a targeted communication to prescribers that includes more information such as a description of the comparable efficacy between the formulary and nonformulary drugs may improve formulary adherence above that noted in this study.[18]

Limitations

We examined only 30 medications that were removed from a drug formulary. Notifications about formulary change for other medications or therapy classes not included in this study may not have similar effects on formulary adherence. However, the medications selected represented approximately 50% of all changed chronic-use medication claims for all subjects in 2003, and there is no compelling evidence to suggest that this type intervention would not be effective for other nonmental health, chronic-use medications or drug therapy classes.

We did not evaluate the geographic distribution of the health plan membership across study arms. However, to our knowledge, there is no available evidence supporting geographic variation in formulary adherence. In addition, we did not assess the effect of sending more than 1 letter to patients experiencing a formulary change. It is unknown whether sending multiple letters would increase formulary adherence or disaffect patients who are comfortable with their prescriber's therapeutic choice. Furthermore, we did not examine all of the economic, clinical, or humanistic outcomes of the drug formulary change notification program. Nevertheless, while it is self-evident that formulary adherent patients will lower their OOP costs, the available evidence suggests that health plans can lower their medication expenditures,[4] maintain quality of care,[6] and increase patient satisfaction[19] when increasing formulary adherence. Future studies should be designed to evaluate the impact of formulary change notification on these outcomes and the cost-effectiveness of such an intervention program.

Conclusion

A letter-based notification program is a pragmatic and effective strategy to increase formulary adherence after formulary change. This intervention program provides education and personalized information that may allow patients to participate more actively in their pharmacotherapy decision making.

ACKNOWLEDGMENTS

The authors would like to acknowledge Julie McLaughlin, Crystalin Moyer, and Michelle Goolsby of Express Scripts, Inc., Maryland Heights, MO, for their invaluable assistance with this study.

DISCLOSURES

This research was sponsored by Express Scripts, Inc., and was obtained by author Thomas Delate. At the time of the study, Delate was director of research at Express Scripts, Inc.; author Rochelle Henderson is employed at Express Scripts, Inc. The authors disclose no potential bias or conflict of interest relating to this article.

Delate served as principal author of the study. Study concept and design, analysis and interpretation of data, and statistical expertise were contributed by both authors. Drafting of the manuscript was primarily the work of Delate, and its critical revision was the work of Henderson.

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