Addition of Generic Medication Vouchers to a Pharmacist Academic Detailing Program: Effects on the Generic Dispensing Ratio in a Physician-Hospital Organization

Vinay Bhargava, PharmD; Mark E. Greg, PharmD; and Mark C. Shields, MD, MBA

BACKGROUND: Generic dispensing ratio (GDR) is an important measure of efficiency in pharmacy benefit management. A few studies have examined the effects of academic detailing or generic drug samples on GDR. On July 1, 2007, a physician-hospital organization (PHO) with a pay-for-performance incentive for generic utilization initiated a pilot generic medication voucher program that augmented its existing pharmacist-led academic detailing efforts. No published studies have examined the role of generic medication vouchers in promoting generic drug utilization.

OBJECTIVE: To determine if supplementing an existing academic detailing initiative in a PHO with a generic medication voucher program would be more effective in increasing the GDR compared with academic detailing alone.

METHODS: The intervention took place over the 9-month period from July 1, 2007, through March 31, 2008. Vouchers provided patients with the first fill of a 30-day supply of a generic drug at no cost to the patient for 8 specific generic medications obtained through a national community pharmacy chain. The study was conducted in a PHO composed of 7 hospitals and approximately 2,900 physicians (900 primary care providers [PCPs] and 2,000 specialists). Of the approximately 300 PCP practices, 21 practices with at least 2 physicians each were selected on the basis of high prescription volume (more than 500 pharmacy claims for the practice over a 12-month pre-baseline period) and low GDR (practice GDR less than 55% in the 12-month pre-baseline period). These 21 practices were then randomized to a control group of academic detailing alone or the intervention group that received academic detailing plus generic medication vouchers. One of 10 intervention groups declined to participate, and 2 of 11 control groups dropped out of the PHO. GDR was calculated monthly for all pharmacy claims including the 8 voucher medications. GDR was defined as the ratio of the total number of paid generic pharmacy claims divided by the total number of paid pharmacy claims for 108 prescriber identification numbers (Drug Enforcement Administration [DEA] or National Provider Identifier [NPI]) for 9 intervention groups [n = 53 PCPs] and 9 control groups [n = 55 PCPs]. For both intervention and control arms, the GDR for each month from July 2007 (start of 2007 Q3, intervention start date) through September 2008 (end of 2008 Q3, 6 months after intervention end date) was compared with the same month in the previous year. A descriptive analysis compared a 9-month baseline period from 2006 Q3 through 2007 Q1 with a 9-month voucher period from 2007 Q3 to 2008 Q1. A panel data regression analysis assessed GDR for 18 practices over 27 months (12 months pre-intervention and 15 months post-intervention).

RESULTS: A total of 656 vouchers were redeemed over the 9-month voucher period from July 1, 2007, through March 31, 2008, for an average of about 12 vouchers per participating physician; approximately one-third of the redeemed vouchers were for generic simvastatin. The GDR increase for all drugs, including the 8 voucher drugs, was 7.4 points for the 9 PCP group practices with access to generic medication vouchers, from 53.4% in the 9-month baseline period to 60.8% in the 9-month voucher period, compared with a 6.2 point increase for the control group from 55.9% during baseline to 62.1% during the voucher period. The panel data regression model estimated that the medication voucher program was associated with a 1.77-point increase in overall GDR compared with academic detailing alone (P = 0.047).

CONCLUSION: Compared with academic detailing alone, a generic medication voucher program providing a 30-day supply of 8 specific medications in addition to academic detailing in PCP groups with low GDR and high prescribing volume in an outpatient setting was associated with a small but statistically significant increase in adjusted overall GDR.

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What is already known about this subject

• Increasing the generic dispensing ratio (GDR) is associated with reduction in drug costs. For example, Express Scripts, a pharmacy benefits management company, estimated that every 1 percentage point increase in GDR is associated with an approximate 1 percentage point reduction in overall drug expenditures.

• Scott et al. (2006) found that a generic drug sampling program using automated generic dispensing machines (kiosks) in physician offices was associated with a higher GDR (55.3%) in the first year of the intervention for kiosk users compared with physicians who did not use the kiosks (54.1%), but the 1.2 percentage point difference in GDR was not statistically significant and declined to a 0.8 percentage-point difference in the second year.

• O’Malley et al. (2006) examined 4 interventions intended to increase GDR (member mailings, advertising campaigns, free generic drug samples to physicians, and physician financial incentives) compared with a benefit design change that doubled copayments for brand name drugs. None of the 4 interventions had a discernable effect on GDR, but doubling copayments for brand drugs was associated with a large positive effect on GDR.

What this study adds

• A generic voucher program providing a 30-day supply of medication to the patient with no copayment in 9 primary care physician (PCP) medical practices in addition to academic detailing was associated with an increase in GDR that was 1.77 percentage points greater than the GDR increase in PCP medical practices that received academic detailing only (P = 0.047).

• This is the first study to evaluate the effect of a generic voucher program on GDR.
The last several years have seen an explosion in the availability of generic versions of branded blockbuster medications. One may refer to it as the “golden age” of generics. In the recent past, widely prescribed brand medications such as Ambien, Flonase, Fosamax, Imitrex, Norvasc, Protonix, Risperdal, Toprol XL, Zithromax and Zocor have all become available as generics. Major brands will continue to lose patent protection into the foreseeable future.

The advantages of utilizing generic drugs, when medically appropriate, are numerous. In addition to substantially lower cost, generic drugs offer the same clinical profile as their brand-name counterparts. For example, in a systematic review and meta-analysis for studies published through August 2008, Kesselheim et al. (2008) found no evidence of superiority of brand drugs compared with generic drugs in 9 subclasses of cardiovascular medications. For health plan members, copayment cost savings from generic drugs average $15 to $30 per 30-day prescription or $180 to $360 annual savings per maintenance drug in 2009. From the health plan perspective, it has been estimated that each 1 percentage point increase in the generic dispensing ratio (GDR) results in 1% reduction in overall pharmacy benefit expenditure.

Despite these advantages, however, significant obstacles remain in the promotion of generic medications. Since generic drugs directly compete with therapeutically similar branded offerings, the pharmaceutical manufacturers of branded medicines utilize their resources to promote the use of single-source brands. The use of samples, detailing by professional sales representatives, and direct-to-consumer advertising (DTCA) are 3 key tactics employed by the pharmaceutical industry. Most promotional spending by pharmaceutical companies is targeted directly at physicians through sampling (57% of total promotional expenditures) or detailing (26%). Although studies are lacking on the impact of detailing on prescribing behavior, the effect of drug samples on prescribing patterns has been studied. For example, in a prospective randomized trial, internal medicine resident physicians randomized to access to drug samples were less likely than control physicians to choose unadvertised drugs (64.9% vs. 73.4% of prescribing decisions, respectively) or to choose over-the-counter (OTC) drugs (25.2% vs. 38.8% of prescribing decisions, respectively).

In addition to samples, pharmaceutical companies have more than quadrupled their spending on DTCA over the last decade. Whereas drug manufacturers spent $985 million on DTCA in 1996, it accounted for more than $4.2 billion in 2005.4 According to research conducted by the Kaiser Family Foundation, on average, each additional dollar spent on DTCA in 2005 yielded $4.20 in additional pharmaceutical sales in that year.

In an effort to combat the brand messaging being deployed by the pharmaceutical industry, many insurers and pharmacy benefits management companies (PBMs) have implemented various programs to take advantage of the favorable generic marketplace. Many of these strategies have centered on patients in the form of benefit design incentives. Some of these tactics include (a) lower copayments for generics than for brands, (b) financial penalties for using a brand drug when a generic drug is available, and (c) step-therapy edits that require the use of a generic drug prior to initiating therapy with a branded product.

At the physician level, Scott et al. (2007) conducted a study at a health plan that assessed the impact of an office-based generic drug sampling system on GDR. The health plan used an automated generic dispensing machine (kiosk) in physician offices to dispense 21 distinct generic drugs. In the first year of this program, the average overall GDR for physicians participating in the sampling program was 1.2 percentage points higher than for physicians who did not participate in the program. However, this difference was not statistically significant, and the difference declined to 0.8 percentage points in the second year of the intervention. O’Malley et al. (2006), using a quasi-experimental study design, evaluated the effect of 4 different interventions (member mailings, advertising campaigns, free generic drug samples to physicians, and physician financial incentives) on changes in GDR. The study was performed at Blue Cross Blue Shield of Michigan utilizing multiple comparison groups of insured individuals who closely matched enrollees exposed to the interventions. Results showed that none of these 4 interventions had a positive effect on GDR. For example, for retail pharmacy sales with a baseline GDR of 45%, there was a -6.03 percentage-point change in GDR with the mailing intervention, -0.15 change with advertising, -0.02 change with generic sampling, and -0.40 change with physician incentive. The only intervention that did show a positive effect on GDR was a doubling of copayments for brand name drugs: the GDR increased by +9.55 percentage points.

Advocate Physician Partners (APP), a physician-hospital organization (PHO), is the care management and managed care contracting joint venture between Advocate Health Care and select physicians on the medical staff of Advocate hospitals. The physician network includes more than 900 primary care physicians (PCPs) and 2,000 specialists. APP is associated with 7 hospitals in the Chicagoland area. As part of its clinical integration program, APP has GDR as one of its pay-for-performance (P4P) measures.

APP initiated an academic detailing program for its physicians in the second quarter of 2006. Academic detailing involves the use of clinical consultants, typically pharmacists, who meet face-to-face with providers to offer them unbiased, evidence-based clinical information about the medications that they frequently prescribe. In late 2006, APP made a decision to pilot a generic medication voucher program. APP saw several benefits to offering its physicians a voucher program instead of a generic sampling initiative. First, a voucher program would allow for a longer duration of use for the medications (i.e., a 30-day supply) compared with samples, which are typically
given out for 5-10 days of use. Because Illinois pharmacy laws have explicit labeling requirements for samples exceeding a 72-hour supply, providing a 30-day supply of samples would have been onerous for the organization.11 Second, a voucher program would bypass the need for shelf space to store samples. Third, whereas in a sampling program a physician office needs to track or monitor each dispensed sample, this tracking would be unnecessary with a voucher initiative. Lastly, APP wanted to evaluate the impact of a voucher program from a research perspective, since there have been no scientific studies of vouchers for generic medications.

The goal of this study was to assess the impact on GDR for PCP sites that received both academic detailing and generic medication vouchers versus physician practice sites that received academic detailing alone. The project was approved by the Advocate Institutional Review Board (IRB).

Methods

Subject Selection

The PHO receives pharmacy claims data quarterly from 6 contracting insurers. Prescription claims data were used to calculate prescriber-level GDRs, where prescribers were uniquely defined by either their Drug Enforcement Administration (DEA) number or National Provider Identifier (NPI). At the group practice level, the pharmacy director sorted prescription utilization data both by claims volume and GDR. Practice sites with relatively high volumes (more than 500 prescription claims for the practice over a 1-year pre-baseline period from 2005 Q4 through 2006 Q3) and low GDRs (practice GDR less than 55% over the 1-year pre-baseline period) were chosen for randomization. Twenty-one practice sites were eligible for the pilot program based on these criteria. The practices that met the criteria were generally the larger practices (on average 3 or more physicians per practice) typically located in affluent suburban areas.

In December 2006, these 21 group practices were randomized using a random number generator (available at http://pangloss.com/seidel/rnumber.cgi) for inclusion in either the control group (academic detailing only) or the intervention group (academic detailing plus access to generic medication vouchers). After randomization, 10 group practices were included in the intervention arm, and 11 group practices were part of the control group. One intervention group practice declined participation because it had recently moved to an electronic medical record (EMR) system and did not want to initiate a paper-based program. Thus, the GDR for that group is not presented here, and it was not included in the final analysis. Two control group practices dropped out of the PHO for business reasons after randomization had occurred but prior to the start of the study. As no data were available on these 2 groups after 2006 Q4, these practices were also excluded from the final analysis. The final sample included physicians in 9 PCP intervention and 9 PCP control practices. The pilot trial (i.e., the period during which generic vouchers were redeemed) took place over 9 months between July 1, 2007, and March 31, 2008. The data presented in this study were derived from the pharmacy claims for dates of service from July 1, 2006, through September 30, 2008 (i.e., 12 pre-intervention months from 2006 Q3 through 2007 Q2 and 15 post-intervention months from 2007 Q3 through 2008 Q3).

Intervention Procedures

Program medicines were selected from the top 25 medications based on prescription volume for the entire PHO in the 1-year pre-baseline period from 2005 Q4 through 2006 Q3. High-volume medications in the areas of hypertension, type 2 diabetes, depression, and hyperlipidemia were selected. These 4 disease states were chosen because these are 4 common chronic conditions where a number of generic alternatives exist. Table 1 lists the medications selected for the voucher program, including their dosages and the maximum allowed quantity.

APP contracted a PBM with a large retail pharmacy presence, Walgreens Health Initiatives, to produce the vouchers, perform the claims processing, and provide reporting on voucher use. Weekly conference calls were conducted with the PBM in the months prior to the program launch and for several weeks following launch. The study PBM was the exclusive administrator for the free generic medications pilot program.

### TABLE 1  Generic Voucher Medication List

<table>
<thead>
<tr>
<th>Drug Therapy Indication</th>
<th>Generic Name</th>
<th>Brand Name</th>
<th>Voucher Doses (mg)</th>
<th>Quantity Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>citalopram</td>
<td>Celexa</td>
<td>10, 20, 40</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>sertraline</td>
<td>Zoloft</td>
<td>25, 50</td>
<td>30</td>
</tr>
<tr>
<td>Diabetes</td>
<td>metformin or metformin ER</td>
<td>Glucophage or Glucophage XR</td>
<td>500</td>
<td>60</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>simvastatin</td>
<td>Zocor</td>
<td>5, 10, 20, 40</td>
<td>30</td>
</tr>
<tr>
<td>Hypertension</td>
<td>atenolol</td>
<td>Tenormin</td>
<td>25, 50</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>HCTZ</td>
<td>Hydrodiuril</td>
<td>25, 50</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>lisinopril</td>
<td>Prinivil/</td>
<td>2.5, 5, 10, 20, 30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zestrel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>lisinopril/</td>
<td></td>
<td>10 / 12.5, 20 / 12.5, 20 / 25</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>HCTZ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER = extended release; HCTZ = hydrochlorothiazide; mg = milligrams; XR = extended release.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

386  Journal of Managed Care Pharmacy  JMCP  July/August 2010  Vol. 16, No 6  www.amcp.org
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APP employs a pharmacy director who oversees all pharmacy programs for the organization and a clinical pharmacist whose primary responsibility is to provide support to APP physicians related to pharmacy P4P measures. The pharmacy director and clinical pharmacist scheduled meetings with each of the intervention group practices to introduce the program. At each practice, all of the physicians and key clinical staff were invited to attend these meetings. The PHO director and PHO medical director were also invited and provided support. Program overview folders were prepared for the site visit. Each folder contained (a) a 1-page program overview summary, (b) a color mock-up of the medication voucher, (c) a 3-page question and answer summary, (d) a list of all Walgreens pharmacies in Illinois, (e) type 2 diabetes treatment guideline, (f) congestive heart failure treatment guideline, (g) statin-based lipid-lowering guideline, and (h) generic antidepressant use summary. Whereas the intervention groups received all of this material, the control groups, as part of the existing academic detailing program, received only items e-h.

Each voucher was 8½” by 11” and contained a unique voucher number to allow pharmacy claim submission and tracking. This unique number was used to validate the eligibility of the prescription within the program. For this reason, each voucher was to be used for only 1 medication. Physicians could provide their patients with multiple vouchers if 2 or more medications were necessary for the patient. Vouchers were printed on tear-off pads containing 100 vouchers each. Each physician and office manager were given a pad of 100 vouchers. The pharmacy director and clinical pharmacist then followed up with the offices biweekly to assess the need for additional vouchers, answer questions, and obtain program feedback. The study PBM provided a secure Internet-based reporting portal to track processed vouchers. The clinical pharmacist monitored the report each business day. APP received a monthly invoice for processed vouchers from the study PBM.

Group practices in both the control and intervention arms received academic detailing from the clinical pharmacist throughout the course of the study. Academic detailing involved the following: (a) regular meetings with physicians, key office contacts, and the office manager; (b) pharmacy reports on physician/practice performance related to pharmaceutical utilization; and (c) clinical recommendations rooted in evidence-based medicine provided by the pharmacist to assist the physician and practice in improving performance. Although participation was voluntary, offices were strongly encouraged by APP leadership to participate. An additional incentive for physicians was the inclusion of the voucher program claims data in their pharmacy program claims data in their GDR calculations. Some physicians indicated that patients were not interested in the vouchers because numerous pharmacies in the area offered low-cost (discount) 30-day and 90-day generic medication fills. The extent of use of these community pharmacy discount generic drug programs could not be determined because there were no claims data for this drug use.

Outcome Measures

For each month, the GDR was calculated for all drugs (i.e., all drug classes, not just the study drugs) by dividing the total number of paid generic pharmacy claims by the total number of all paid pharmacy claims (generic and brand) dispensed. The GDR was calculated for each of 108 prescribers (identified by prescriber DEA or NPI number) for the 53 PCPs in the 9 intervention groups and 55 PCPs in the 9 control groups. Every quarter, the PHO provided the 6 health plans and PBMs that processed PHO pharmacy claims with the prescriber identification numbers for all PHO physicians. The plans/PBMs generated pharmacy claims reports for these pre-specified prescriber identification numbers only. Thus, only pharmacy claims with DEA/NPI numbers for PHO physicians were reported to the PHO. Pharmacy claims for all study PCPs were included in data analysis. GDRs for each practice were aggregated to the practice level, with both numerator (generic claims count) and denominator (total claims count) summed across all physicians in the practice.

Statistical Analysis

To assess the baseline demographic characteristics of the physicians in the intervention and control arms, Pearson chi-square tests and 2-sample t-tests were used. The physicians in the 2 groups were compared in terms of enrollment size, years in practice, gender, and practice specialty. In a descriptive analysis of study outcomes, a 9-month baseline period from 2006 Q3 through 2007 Q1 was compared with a 9-month voucher period from 2007 Q3 to 2008 Q1. Additionally, the GDR for each month from July 2007 through September 2008 was compared with the same month in the previous year (e.g., July 2007 vs. July 2006).

Panel-data regression methods were used to analyze the effect of the voucher program on GDR. The data were a panel of GDR measurements for $T=18$ practices, over $T=27$ months, for a total of 486 observations. The practices were divided into 2 groups: control and intervention, with 9 practices in each group.

Regression Model. $GDR_i$ denotes the GDR measure for practice $i$ in month $t$, $(1 \leq i \leq 18, 1 \leq t \leq 27)$. A difference-in-difference regression model on practice-month GDR measurements was used:

$$GDR_i = a + \beta \cdot (voucher) + \gamma \cdot (time) + \delta \cdot (voucher) \cdot (time) + \epsilon_i,$$

where $a$ is a constant that estimates the unconditional mean GDR for pre-intervention control practices; $\beta$ estimates the difference in GDR between the intervention and control group; $\gamma$ estimates the trend effect of time on GDR; and $\delta$ estimates the effect that the voucher program had on GDR when controlling for these other effects. That is, $\delta$ uses the control group observations along with the pre-intervention observations on the intervention group to disentangle the specific effect of the voucher program.

The data are not random, independent, and identically
distributed. For example, the observations on GDR come from practices of different sizes; some practices account for more than 10% of the total claims, while others account for less than 1%. Thus, in order to get consistent results and meaningful standard errors, as outlined in Wooldridge (2001), this type of stratification is corrected by using the following weighted version of the model:

$$w_{GDR_i} = a \cdot w_i + \beta \cdot w_i(voucher) + \gamma \cdot w_i(time) + \delta \cdot w_i(voucher)(time) + w_i \cdot e_i$$

where each weight, $w_i$, is given by

$$w_i = \sqrt{\frac{\text{claims of practice } i}{\text{total claims}}}$$

and $i = 18$. This weighting scheme makes the data suitable for regression analysis.

### Results

#### Randomization of Practices

The 2 PCP groups were statistically similar by the characteristics of average enrollment size, years in medical practice for the PCPs, physician gender, and practice specialty (Table 2).

The baseline average GDR at the time of randomization for both the intervention and control groups was 49.0%, based on prescription claims data during the pre-baseline period from 2005 Q4 through 2006 Q3.

#### Generic Dispensing Ratio

After the pilot phase ended on March 31, 2008, data collection regarding GDR continued for an additional 6 months until September 30, 2008. Prior to program implementation, the monthly aggregated GDR for the control group was higher than that of the intervention group (Figure 1, Table 3). This difference, however, narrowed during the course of the post-implementation phase, and finally, in August 2008, the GDR for the intervention group exceeded that of the control group.

Figure 2 illustrates the changes in GDR from baseline, with baseline for each month defined as 1 year prior to that month (e.g., baseline for January 2008 was January 2007) for the intervention and control groups. Generally, during the course of the 15 months, the intervention group demonstrated a greater change in GDR from baseline compared with the control group. Comparing the 9-month baseline period (from 2006 Q3 through 2007 Q1) with the 9-month voucher period (from 2007 Q3 through 2008 Q1), the GDR increases for all drugs, including the 8 voucher drugs, were 7.4 percentage points for the intervention group (from 53.4% to 60.8%) and 6.2 percentage points for the control group (from 55.9% to 62.1%).

In the panel regression analysis, the estimated effect of the voucher program on GDR ($\delta$) was an increase of 1.77 percentage points. The estimate has a t-value of 1.99 ($P = 0.047$, Table 4).

### Number of Vouchers Redeemed and Top Medications Used

Thirty vouchers were redeemed during the first month of the program (Table 5). Over the following 8 months, an average of 78 vouchers was redeemed monthly for a total of 656 vouchers redeemed during the 9-month pilot period. Cardiovascular medications simvastatin and lisinopril were the 2 most common drugs in the voucher program (Table 5).

### Discussion

APP recognizes that preferential generic prescribing requires a change in behavior. The intent of the voucher program was to provide another tool to PHO physicians that could potentially affect their prescribing behavior. The voucher initiative was a value-added program that complemented various existing promotional efforts (e.g., academic detailing, P4P) that encourage the use of cost-effective medically appropriate generic medications.

Frequent program reminders in person, phone calls, and emails were required to encourage and maintain program participation. The office manager and nursing staff served as important resources for reinforcing the program with the physicians. Participation in the voucher program afforded an opportunity for the clinical pharmacists to develop relationships with the physicians and practices. In turn, these relationships allowed the communication of other generic medication-related information including benefit plan design changes favoring generic medications, 1-page summaries of new brand-name medications, and announcements of newly approved generic medications. Several of the practices indicated that they liked the program and wanted it to continue beyond the pilot period. In addition, some of the physician offices not involved in the voucher program expressed their interest in participating.

Feedback provided by physicians and office staff indicated that patients were satisfied with the program. This was noted particularly for the simvastatin vouchers, since this medication...
was not usually included in the low-cost 30- or 90-day generic drug discount programs offered by the large community pharmacy chains such as Walmart and Target.

In terms of the change in monthly GDR when compared with baseline, intervention group practices generally outperformed control group practices. Although the control group initially had a higher GDR than the intervention arm, the difference narrowed during the course of the study, and eventually the GDR for the intervention group slightly exceeded the GDR for the control group. Finally, the regression analysis demonstrated that the intervention (i.e., vouchers for generic medications) had a small but statistically significant impact on GDR; it was estimated that the generic medication voucher program increased the GDR by 1.77 percentage points.

The authors anticipated a learning curve for physicians and office staff pertaining to the consistent use of vouchers. Whereas most physicians are intimately familiar with the use of drug samples for branded pharmaceuticals, the voucher program for generic medications is a relatively untested concept. Also, the impact of the voucher program is not seen immediately because when the voucher is redeemed, that generic prescription counts as only 1 fill; it takes multiple refills of that generic prescription over several months before there is an observable impact on the GDR. Regardless, for any organization looking to implement a similar program, the results from this study demonstrate the need for a long-term commitment.

This pilot program demonstrated that a generic medication voucher program could be an effective tool for influencing prescribing behavior and result in an increase in the use of generics. This effect is potentially important for managed care organizations in light of estimates that each percentage point increase in the generic GDR leads to a 1 percentage point reduction in pharmaceutical expenditure. Applying this estimate to our finding that the differential effect was 1.77 percentage points in GDR, this generic voucher program could produce drug cost savings of approximately $0.71 per member.
Addition of Generic Medication Vouchers to a Pharmacist Academic Detailing Program: Effects on the Generic Dispensing Ratio in a Physician-Hospital Organization

### TABLE 3  
Generic Dispensing Ratios by Calendar Quarter

<table>
<thead>
<tr>
<th>Practice</th>
<th>Baseline (%)</th>
<th>Post-Program Implementation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice A</td>
<td>53.7</td>
<td>57.6</td>
</tr>
<tr>
<td>Practice B</td>
<td>56.4</td>
<td>58.0</td>
</tr>
<tr>
<td>Practice C</td>
<td>52.1</td>
<td>57.9</td>
</tr>
<tr>
<td>Practice D</td>
<td>52.8</td>
<td>55.9</td>
</tr>
<tr>
<td>Practice E</td>
<td>55.2</td>
<td>58.2</td>
</tr>
<tr>
<td>Practice F</td>
<td>51.3</td>
<td>53.3</td>
</tr>
<tr>
<td>Practice G</td>
<td>51.8</td>
<td>55.7</td>
</tr>
<tr>
<td>Practice H</td>
<td>43.8</td>
<td>46.9</td>
</tr>
<tr>
<td>Practice I</td>
<td>42.2</td>
<td>48.2</td>
</tr>
<tr>
<td>All control group practices</td>
<td>53.9</td>
<td>56.5</td>
</tr>
</tbody>
</table>

Counts

- **Total generic claims:** 11,496 12,520 12,889 13,166 12,852 14,567 15,378 13,994 12,193
- **Total claims:** 21,348 22,167 22,558 22,631 21,527 23,622 23,752 21,225 18,668

### Intervention Group

<table>
<thead>
<tr>
<th>Practice</th>
<th>Baseline (%)</th>
<th>Post-Program Implementation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice J</td>
<td>57.1</td>
<td>57.5</td>
</tr>
<tr>
<td>Practice K</td>
<td>53.1</td>
<td>52.1</td>
</tr>
<tr>
<td>Practice L</td>
<td>49.6</td>
<td>52.4</td>
</tr>
<tr>
<td>Practice M</td>
<td>55.4</td>
<td>56.3</td>
</tr>
<tr>
<td>Practice N</td>
<td>51.6</td>
<td>53.2</td>
</tr>
<tr>
<td>Practice O</td>
<td>47.7</td>
<td>48.7</td>
</tr>
<tr>
<td>Practice P</td>
<td>54.5</td>
<td>51.0</td>
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<tr>
<td>Practice Q</td>
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<td>54.5</td>
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<tr>
<td>Practice R</td>
<td>53.9</td>
<td>55.7</td>
</tr>
<tr>
<td>All intervention group practices</td>
<td>52.2</td>
<td>53.2</td>
</tr>
</tbody>
</table>

Counts

- **Total generic claims:** 11,911 12,501 13,226 13,573 13,854 15,950 16,345 15,890 14,904
- **Total claims:** 22,828 23,502 24,190 24,423 23,792 26,337 25,616 24,423 22,481

*Generic dispensing ratio was calculated as total generic pharmacy claims divided by total pharmacy claims for 108 prescriber identification numbers on pharmacy claims, 53 PCPs in 9 physician practice groups (intervention), and 55 PCPs in 9 physician practice groups (control), aggregated to the practice level.
PCP = primary care provider.

per month (PMPM) in a pharmacy benefit plan with a $40.00 PMPM cost, or savings of $8.30 per member per year.

Based on the results of the pilot and interest in the program from other physicians within the organization, APP continued offering the generic voucher program to its physicians. Starting in 2008 3Q, APP expanded the program to other specialties such as cardiology, pediatrics, ophthalmology, and obstetrics and gynecology. Generic medication offerings were also increased substantially at that time and in 2010 include nearly 100 different medications but in a copayment-subsidy method rather than complete generic copayment waiver.

### Limitations

First, the PCP practice groups for both the intervention and control arms were chosen based on their high prescription claims volume and low GDRs (less than 55%) in a 12-month pre-baseline period from 2005 Q4 through 2006 Q3 that overlapped the 12-month “baseline” period for the panel regression analysis (2006 Q3 through 2007 Q2). Although the average GDR for both the intervention and control groups was 49% in the pre-baseline period, the average GDR in the last quarter of the baseline period (2007 Q2) was 55.6% for the 9 medical practices in the intervention group versus 58.2% for the 9 medical practices in the control group. Therefore, unmeasured differences between the groups may have accounted for some of the variation in prescribing behavior and GDR, possibly biasing the results in favor of the intervention. Second, the pilot test was limited to low-GDR practices to maximize the program’s potential benefit to the PHO. The medical practices that met the inclusion criteria tended to be larger (3 or more physicians per practice) and more often located in affluent areas. Thus, study results may not be generalizable to all
Addition of Generic Medication Vouchers to a Pharmacist Academic Detailing Program: Effects on the Generic Dispensing Ratio in a Physician-Hospital Organization

FIGURE 2  Monthly Percentage Point Changes in Generic Dispensing Ratio Compared with Baseline

Baseline is defined as the same month during the previous year. The voucher intervention started July 1, 2007. Generic dispensing ratio was calculated as total generic pharmacy claims divided by total pharmacy claims for 108 prescriber identification numbers on pharmacy claims, 53 PCPs in 9 physician practice groups (intervention), and 55 PCPs in 9 physician practice groups (control), aggregated to the practice level. PCP = primary care provider.

TABLE 4  Weighted Difference-in-Difference Regression of Generic Dispensing Ratio Level on Time and Intervention

\[ wGDR_i = \alpha \cdot w_i + \beta \cdot w_i(\text{voucher}) + \gamma \cdot w_i(\text{time}) + \delta \cdot w_i(\text{voucher})(\text{time}) + w_i \cdot \epsilon_i \]

Coefficient  Estimate  Standard Error  T-Statistic  P Value
-\( \alpha \) 0.0641 0.0045 126.16 < 0.001
-\( \beta \) -0.025 0.0059 -4.23 < 0.001
-\( \gamma \) 0.0704 0.0068 10.37 < 0.001
-\( \delta \) 0.0177 0.0089 1.99 0.0471

\( n = 486 \)  R-squared 0.9644

The regression equation is multiplied by weights to adjust for the stratified sample. The weights are given by

\[ w_i = \sqrt{\frac{\text{claims of practice } i}{\text{total claims}}} \]

and \( i = 18 \) (count of practices).

The data are a panel of 18 practices measured monthly from July 2006 to September 2008. The intervention began in July 2007. GDR = generic dispensing ratio.

TABLE 5  Number of Redeemed Vouchers by Generic Medication

<table>
<thead>
<tr>
<th>Medication</th>
<th>Number of Vouchers Processed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simvastatin</td>
<td>206</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>106</td>
</tr>
<tr>
<td>Sertraline</td>
<td>86</td>
</tr>
<tr>
<td>Citalopram</td>
<td>69</td>
</tr>
<tr>
<td>Lisinopril/HCTZ</td>
<td>65</td>
</tr>
<tr>
<td>HCTZ</td>
<td>35</td>
</tr>
<tr>
<td>Metformin ER</td>
<td>34</td>
</tr>
<tr>
<td>Metformin</td>
<td>33</td>
</tr>
<tr>
<td>Atenolol</td>
<td>22</td>
</tr>
<tr>
<td>Total vouchers redeemed</td>
<td>656</td>
</tr>
</tbody>
</table>

*Number of vouchers redeemed between July 6, 2007, and March 31, 2008. ER = extended release, HCTZ = hydrochlorothiazide.
prescribers and physician practices.

Third, the study is somewhat limited in sample size. While panel data studies often deal with small samples, the fact remains that such small samples hinder parametric analysis. More data would be useful in evaluating the statistical model. Fourth, because this PHO provides care to several health plans, pharmacy claims for the prescribers in the control and intervention reports were extracted based on a list of DEA numbers with a crosswalk to NPI numbers rather than by member ID number. Therefore, some pharmacy claims, generally in the range of 2%-3% for the several sources of pharmacy claims, have either missing or unmatched DEA/NPI numbers, and there may have been some undetected systematic bias in the number of pharmacy claims that could not be matched to a valid prescriber. Fifth, there is the important issue of the unmeasured effect of community pharmacy generic discount programs (e.g., $4 for 30-day supply or $10 for 90-day supply) offered by pharmacy chains such as Target and Walmart. However, we have assessed pharmacy claims data for this PHO and could not discern a drop in PMPM utilization that might be associated with “lost” generic claims.

Sixth, the pharmacists who provided academic detailing were not blinded to the intervention (i.e., the pharmacists were aware of which practices were receiving academic detailing only and which practices were receiving academic detailing and vouchers). Seventh, because we did not measure the cost of the intervention or whether its effects persisted beyond the brief study period (e.g., whether patients continued to use generic medication), it is not possible to draw conclusions about the intervention’s cost effectiveness. Finally, we could not investigate the possible effects of member cost share differences for generic versus brand drugs because of the number of different pharmacy benefit designs among several health plans.

Conclusion

The combination of a generic medication voucher program for 8 specific drugs plus academic detailing resulted in a small but statistically significant increase in GDR of 1.77 percentage points compared with academic detailing alone.

DISCLOSURES

There was no external funding for this intervention in this physician-hospital organization. Bhargava and Shields designed the study. Greg had primary responsibility for data collection with the assistance of Bhargava and Shields. All 3 authors analyzed and interpreted the data. Bhargava had primary responsibility for writing and revising the manuscript with the assistance of Greg and Shields.

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REFERENCES


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