Increasing Generic Prescribing: A Resident Educational Intervention

William C. Wadland, MD; Lynda Farquhar, PhD; Faith Priester, RN; Kathleen Oberst, MS; David P. Weismantel, MD

Background and Objectives: Future physicians are urged to balance effectiveness and cost in their prescribing of medications. This study determined whether educational sessions for residents together with a “Resident Report Card” changed residents’ prescribing of generic medications in both commercial and Medicaid patient panels, compared with regional performance of physicians in practice in the community.

Methods: Twenty-four family medicine residents providing care for 1,038 (600 Medicaid and 438 commercial) members (or 31,140 total member months) received biannual profiles of their prescribing patterns and participated in four training sessions related to prescription profiling within a regional health plan. We monitored prescribing during two time periods and compared rates of generic prescribing to a baseline rate.

Results: Resident generic prescribing increased significantly for commercial members, from a base period (July 1, 2000–June 30, 2001) rate of 38.4% to a period 1 (July 1, 2001–June 30, 2002) rate of 38.0% and a period 2 (July 1, 2002–December 31, 2002) rate of 47.9%. It also increased for Medicaid members, from a base period rate of 47.8% to a period 1 rate of 49.1% and a period 2 rate of 52.6%. There was no similar change in regional prescribing performance during the same periods for physicians in practice in the community.

Conclusions: Feedback systems and training based on actual health plan data can be developed for residency training on prescribing performance, resulting in improved cost-efficient prescribing patterns.

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One of the biggest cost increases in US health care is the rising cost of prescription medications. On average, total prescription drug spending in the United States grew by 13% per year between 1993 and 2000 and is expected to grow by about 12% per year through 2011. Employers, managed care and other insurance companies, and patients have called for efforts to urge physicians to prescribe medications in the most cost-saving manner. Generic prescribing is one way to reduce prescription drug costs.

We selected a feedback intervention for this study because feedback to physicians has been widely studied and found to be at least moderately effective. In a review of 85 studies by Jamtvedt et al, audit and feedback were compared to no intervention. The effectiveness of audit and feedback was shown, although effects were small to moderate. Feedback effects are more likely to occur when baseline adherence to recommended practice is low. In a second study, a meta-analysis by Balas et al, the conclusion was that physician profiling (ie, feedback) had a statistically significant but minimal effect on the utilization of clinical procedures. In a third review of 12 studies by O’Brien et al, educational interventions were shown to enhance the effectiveness of feedback. In a study by Bielby and Silagy that reviewed studies providing costing information on medications, feedback on drug costs increased generic prescribing. A study by Nilsson et al, that was designed to develop a working model for influencing prescribing behavior of general practitioners found that feedback on individual prescribing rates combined with problem-oriented visits was effective in influencing prescribing. Another study by van Eijk et al supported the Nilsson et al work, concluding
that both individual and group visits decreased the prescribing of the targeted drug. Finally, a study by Kogan\textsuperscript{10} that used report cards with residents showed no significant differences in prescribing. However, in this case, report cards were linked to chart audits that looked at immunizations and other health promotion efforts.

In our study, we examine the prescribing of generic medications, a physician behavior that might be somewhat easier to influence with report card interventions and education.

The intervention in this study combined educational sessions with a “resident report card.” The report card provided a peer comparison in prescribing and represented our complementary educational intervention to the feedback that residents received in the educational sessions. Our previous work with report cards,\textsuperscript{11,12} as well as the other literature cited above led us to the conclusion that the best available strategy to influence resident rates of generic prescribing would be educational sessions combined with report cards that compared each resident with his/her peers.

In previous research, we described the development of a consortium for graduate medical education on population and managed care between the College of Human Medicine, Edward W. Sparrow Hospital (Sparrow), and a managed care insurance company (Physicians Health Plan of Mid-Michigan [PHPMM]).\textsuperscript{13} Since its establishment in 1998, the Capitol City Consortium has been productive as a focus for education and research. The members of the consortium have completed studies on the development of graduate medical education curriculum,\textsuperscript{11} resident report cards that provided residents with data on patient services rendered for a Medicaid population together with cost proxies for such services across the continuum of care,\textsuperscript{12} resident attitudes toward managed care, and, most recently, comparing resident care for both commercial and Medicaid patient populations.

The study described here determined whether residents use of brand name and generic drug prescribing was influenced by educational sessions that included a peer comparison report card and whether there was a difference between commercial and Medicaid patient populations with respect to rates of generic prescribing. We chose to review both patient populations because many forms of commercial insurance do not cover all brand-name medications and often cover generics. In the Medicaid patient population, the formulary in Michigan is extremely liberal. Virtually all prescribed medications are fully covered. Thus, we were especially curious about whether the residents would prescribe generic medications for their Medicaid patients when Medicaid patients are less likely to urge doctors to prescribe less-costly medications. The study goes beyond previously reported investigations in that residents received report card feedback based on their performance in clinical practice with managed care patients and was consistent with managed care reports received by community physicians who routinely receive such report cards on their prescribing practices.

**Methods**

**Subjects**

Residents in the Sparrow/Michigan State University (MSU) Family Medicine Residency Program were selected to receive the multi-session educational intervention. The project was approved by the Human Subjects Committees of both Sparrow and MSU.

The project was conducted over 3 years with residents grouped by entering class (eight per class, 24 total). Eight residents per year were added to the residency program, and these residents were assigned to three different continuity clinic practices. The study began with the resident cohort entering the program in July 2000, and subsequent classes in 2001 and 2002 became part of the study as they began the residency program.

**Educational Objectives**

Four educational sessions for the family medicine residents were conducted in 2001. The entire group received education at the same time. The sessions had three objectives. The first objective was to provide education on content and methods of typical physician profiling, including utilization and quality-of-care data presented by local clinicians. The second objective was to provide site-specific data for each resident class and faculty providers and to compare the site as a whole with local and national data where available. These data were limited to Medicaid and commercial members at three sites, all insured by PHPMM. The third objective was to encourage the use of handheld technology to increase the practice of guideline-appropriate care of patients and the use of the PHPMM formulary.

**Educational Program**

Four 1.5-hour educational sessions, usually with lunch provided, were held during the regularly scheduled didactic times and were attended by all family medicine residents and faculty members who were not on specialty rotations. They included the following four components:

**Introduction to Physician Reporting and Data Profiling.** Local physician leaders and health plan medical directors reviewed physician profiling tools from various health plans, with special attention given to practical application to medical management decisions.

**Diabetes Care in the 21st Century.** A comprehensive review of the appropriate care for patients with diabetes was presented, including up-to-date pharmacy man-
agement. This was followed by a discussion of office aids for the resident clinics and the diabetes management program.

**Using Utilization Reports to Identify Practice Management Patterns of Care.** A local physician from a well-managed family medicine office presented his own recent physician profile, or report card, from two local health plans and discussed how it affected his reimbursement and how he and his partners use these profiles in their practice management decisions. The resident class-specific report cards were distributed, and the physician reviewed the reports with the residents, pointing out the areas of interest for practice management, including emergency room utilization, admission rates, and pharmacy (Table 1).

**Formularies, Health Promotion, and Management Programs: Maximizing the Resources Available Through Contracted Health Plans.** This session was led by a PHPMM pharmacist and the disease management director. Residents were given an overview of the formulary and also of the chronic disease management programs available to health plan members.

**Tracking Prescribing Behavior**

To track family medicine residents’ prescribing for outpatients, all three resident practice sites were used. We identified patients who were seen by residents and who had commercial health care coverage or Medicaid managed care coverage provided by PHPMM. During the study period, each resident was assigned a unique resident identification number. Each clinic was able to provide hard copy or electronic files containing resident name, patient insurance identification number, and date of service on a monthly basis. Electronic information was directly imported into a password-protected Microsoft Access database. Hard copy data were manually entered. Random data entry checks were conducted to verify accuracy.

We assigned the resident of record on the first service date for each patient as the “primary care resident.” When we identified identical patient IDs on subsequent report(s) from a clinic, we compared the resident(s) identified at the subsequent visits to that initially documented. From time to time, patients were seen by residents other than the primary care resident. Patients were assigned ultimately to the resident they saw the most number of times during the study period or the first

Table 1

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Member Type</td>
<td>Total Patients</td>
<td>Total Residents</td>
</tr>
<tr>
<td>1</td>
<td>1,491</td>
<td>60</td>
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<tr>
<td>2</td>
<td>1,277</td>
<td>60</td>
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</table>

**Pharmacy Information**

<table>
<thead>
<tr>
<th>Script Code</th>
<th>Type</th>
<th>New Scripts</th>
<th>New Charges</th>
<th>Refill Scripts</th>
<th>Refill Charges</th>
<th>Total Charges</th>
<th>Count</th>
<th>Average Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand</td>
<td>1</td>
<td>372</td>
<td>$30,618.57</td>
<td>341</td>
<td>$20,124.58</td>
<td>713</td>
<td>$50,743.15</td>
<td>$71.17</td>
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<tr>
<td>Generic</td>
<td>1</td>
<td>375</td>
<td>$15,094.32</td>
<td>416</td>
<td>$9,687.24</td>
<td>791</td>
<td>$24,781.56</td>
<td>$31.33</td>
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<tr>
<td>Med Supp</td>
<td>1</td>
<td>25</td>
<td>$1,113.75</td>
<td>25</td>
<td>$1,034.35</td>
<td>50</td>
<td>$2,148.10</td>
<td>$42.96</td>
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<tr>
<td>Brand</td>
<td>2</td>
<td>568</td>
<td>$46,055.51</td>
<td>201</td>
<td>$14,985.32</td>
<td>769</td>
<td>$61,040.83</td>
<td>$79.38</td>
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<tr>
<td>Generic</td>
<td>2</td>
<td>436</td>
<td>$17,516.65</td>
<td>271</td>
<td>$7,388.54</td>
<td>707</td>
<td>$24,905.19</td>
<td>$35.23</td>
</tr>
<tr>
<td>Med Supp</td>
<td>2</td>
<td>13</td>
<td>$371.06</td>
<td>4</td>
<td>$175.40</td>
<td>17</td>
<td>$546.46</td>
<td>$32.14</td>
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</table>

**Combined Pharmacy**

<table>
<thead>
<tr>
<th>Member Type</th>
<th>Total Claimed</th>
<th>Total Scripts</th>
<th>Combined Average Cost</th>
<th>Percent Generics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$75,524.71</td>
<td>1,504</td>
<td>$50.22</td>
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<tr>
<td>2</td>
<td>$85,946.02</td>
<td>1,476</td>
<td>$58.23</td>
<td>47.90</td>
</tr>
</tbody>
</table>

Member Type 1—Medicaid
Member Type 2—Commercial

Script Code:
- Brand—trademark medication prescribed
- Generic—generic medication prescribed
- Med Supp—medical supplies prescribed

New script—new medication prescribed for patient
Refill script—refill prescription for medication that patient is currently taking
resident who saw the patient if no single resident had a majority of visits.

Every 6 months, a file was forwarded with patient IDs to PHPMM, which matched the IDs to their membership database. In the event that an ID could not be matched, we provided name and date of birth information to the insurer so they could verify whether the individual had health care coverage through his/her commercial or Medicaid product. The insurer provided information on all claims and encounters they processed for each matched member ID as an electronic file that we imported into the project database.

Baseline and continuing pharmacy utilization information for residents was provided and discriminated between new prescriptions and refill orders with accompanying charges. Each pharmacy entry identified the medication as brand or generic equivalent. We computed the proportion of generic medications prescribed for patients. Because of concerns regarding health care utilization patterns of different patient populations, health care statistics were reported separately for commercial and Medicaid patients on the resident profiling reports.

To look at general community trends during the study period, we asked our managed care partner, PHPMM, to look at any change in the generic prescribing rate in their membership as a whole during this period. The PHPMM total number of primary care physicians in 2001–2002 was 415 and, of those, 313 accepted Medicaid.

Data Analysis

We looked for a significant linear change in generic prescribing rate over the three time periods using the Cochran-Armitage test for trend statistic, which tests for trend in binomial proportions across levels of a single factor or covariate. This test is appropriate for a contingency table where one variable has two levels and the other variable is ordinal and may look specifically for a significant upward or downward movement in a time series. In an effort to maximize patient panel sizes and associated health care activity reports for the resident physicians, the requirement for member continuous enrollment throughout the entire study period was not established. We accepted the limitations of this approach knowing that our assignment of a resident panel was experimental. Since our member population was not static during the entire time frame, we were unable to conduct matched analyses. All analyses were performed using SAS version 8.2® statistical software (SAS Institute Inc, Cary, NC).

Results

Twenty-four family medicine residents were included in our cohort. Average attendance per educational session was 80%. These residents provided care to 1,038 (600 Medicaid and 438 commercial) members at the clinics included in the study, accounting for 31,140 total member months during the data collection time frame (July 1, 2000–December 31, 2002). A significant increase in generic prescribing was noted over the study period for both commercial (P<.0001) and Medicaid (P=.0024) patient populations (Table 2) Three time periods were chosen for data collection. Baseline was before the intervention. Periods 1 and 2 were during and after the educational sessions.

Comparative Performance by Physicians in Practice in the Community

The trend in the community during the study period showed no appreciable change in generic prescribing (Table 3). Faculty members teaching the residents, who were included in the comparison group of physicians practicing in the community, also did not demonstrate a change in prescribing generics. Thus, resident prescribing of generic versus brand medications changed significantly, while community physicians and residency faculty did not show a comparable change in prescribing during the same time frame.

Discussion

This study illustrates that a “real world” report card can be generated for residents, similar to such report cards provided to practicing physicians, and that these

<table>
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<th>Table 2</th>
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<tbody>
<tr>
<td><strong>Family Medicine Resident Generic Prescribing Rates</strong></td>
</tr>
<tr>
<td>Member Type</td>
</tr>
<tr>
<td>Commercial</td>
</tr>
<tr>
<td>Medicaid</td>
</tr>
<tr>
<td>P Value*</td>
</tr>
</tbody>
</table>

* Cochran-Armitage test for trend statistic

CI—confidence interval

Each cell contains the rate of prescribing generics, the 95% CI on that rate, as well as (in parentheses) the numerator and denominator from which the rate was computed.
Changing from a one-tier (standard formulary and co-pay) to a three-tier (levels of co-pays based on drug choice and cost) formulary without provider education or feedback has been reported to result in the continuation of the use of brand-name medications and out-of-pocket expenditures for enrollees. This is consistent with the performance of our community physician group, which showed no change in generic prescribing rates during the study periods.

**Limitations**

Some limitations in the study include having no comparative control groups. We recommend repeating this study with a larger group of residents and a control group to address this limitation. There was also little residency faculty participation or reinforcement. This is a chronic problem in residency education when educators from outside the program attempt educational interventions. We recommend that residency faculty be more involved in the design of studies to remedy this problem.

Another limitation was that local changes to a three-tier co-payment system promoted the use of generic medications during the course of the project so that we cannot be certain what improvement is attributable to patient demand versus improved resident performance. Finally, the data from this study have more validity at the group level rather than the individual level.

Given the limitations of the study (including the small numbers of residents studied), it would be reasonable to replicate this study with a larger group of residents (including a control group of residents) before recommending that the feedback plus report card methodology be adopted by other residency programs.

**Conclusions**

Acknowledging the aforementioned limitations, our intervention should be applicable to other graduate medical education programs. Investing in training relevant to future clinical practice based on actual performance feedback should have immediate returns for many health plans as resident physicians move into community practice.

**Table 3**

<table>
<thead>
<tr>
<th>Generic Prescribing Rates for Community Physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial PHPMM</td>
</tr>
<tr>
<td>Medicaid PHPMM</td>
</tr>
</tbody>
</table>

* Rates were provided by our managed care partner. Numerator/denominator information was not released during the study period by PHPMM. Total number of primary care physicians in PHPMM in 2001–2002 was 415 and of those, 313 accepted Medicaid.

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Corresponding Author: Address correspondence to Dr Wadland, Michigan State University, Department of Family Practice, B106 Clinical Center, East Lansing, MI 48824-1313. 517-353-0851, ext 428. Fax: 517-355-7700. wadland@msu.edu.

REFERENCES