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**Editorial Content and Peer Review**

All articles, editorials, and commentary in JMCP undergo peer review; articles undergo blinded peer review. Letters may be peer reviewed to ensure accuracy. The fundamental departments for manuscript submission are:

- Research
- Subject Reviews
- Formulary Management
- Contemporary Subjects
- Brief Communications
- Commentary/Editorials
- Letters

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These are well-referenced, comprehensive reviews of subjects relevant to managed care pharmacy. The Methods section in the abstract and in the body of the manuscript should make clear to the reader the source of the material used in the review, including the specific criteria used for inclusion and exclusion of information and the number of articles included and excluded by each criterion. Narrative reviews defined as noncomprehensive reviews that cover only a portion of the literature on a topic, are not considered for publication by JMCP. However, articles of this type may be considered as Commentary.

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1. Journal article — (list up to 6 authors: if 7 or more, list only the first 3 and add et al): Kastelein JJ, Akdim F, Stroes ES, et al; the ENHANCE

Reference

Just as many of her colleagues who were involved in the establishment of AMCP, Debi Reissman recalls those early days of the organization as a challenging time for pharmacy directors in managed care organizations.

“Many of us felt like islands in a big ocean,” Reissman says. “Until AMCP, there was no collaborative venue for managed care pharmacists and pharmacy directors, who at the time were truly operating as entrepreneurs in an emerging field.”

Reissman became treasurer of Academy of Managed Care Pharmacy (AMCP) in 1991, filling out the term of Perry Cohen, who had become the academy’s president-elect, and subsequently was elected to another full term in that office. At the time, she remembers, “electronic prescription processing at the point-of-sale and rebate contracts were just beginning to be embraced in the industry.” She also reminisced that in the early days, the AMCP treasurer did all the banking, wrote checks to pay all the academy’s expenses, and coordinated the sales of AMCP coffee mugs, pins, and t-shirts in efforts to raise funds.

The growth and development of managed care pharmacy was mirrored in Reissman’s challenges in her professional career, as she took on the creation of PacifiCare Health System’s pharmacy benefit management (PBM) subsidiary, Prescription Solutions. Reissman was with PacifiCare for 8 years and served as president of the PBM for 4 years while it grew to serve more than 4 million covered lives with over $500 million in annual revenue.

“We served both internal health plan and external customers, housed full claims and reporting capabilities, owned and operated a mail service facility and 3 stand-alone pharmacies, coordinated generic sampling and couponing programs, operated open and closed formulary systems, and maintained all our own manufacturer contract relationships,” Reissman says.

During those early days with AMCP, Reissman notes, another topic coming to the fore was disease state and medication therapy management—an issue that became increasingly important as she established an independent managed care consulting firm, Rxperts, where she served as president until June 2012. Her company specialized in managing prescription benefit and specialty pharmaceutical programs and provided consulting services in the area of disease and medication therapy management, among others.

Now, at Sharp Healthcare serving as Director of Pharmacy for the Sharp Community Medical Group in San Diego, California, Reissman works “in building pharmacy practice programs within primary care medicine offices, emphasizing the role of pharmacists in disease management, medication adherence, and meeting quality performance metrics.”

Throughout her career, Reissman has remained active with AMCP. Following her tenure as treasurer, she served on the Finance, Professional Practice, and Nominating Committees for the academy and has been featured as a moderator and speaker at many AMCP conferences. She authored the AMCP white paper Pharmacists as Vital Members of Accountable Care Organizations: Illustrating the Important Role That Pharmacists Play on Health Care Teams published in April 2011 and the chapter “Medicare Pharmacy Benefit Management” in Managed Care Pharmacy Practice, 1st and 2nd Editions, edited by AMCP founder Robert Navarro.

Reissman’s pride in AMCP is clear. From its beginnings as a way to connect those “islands in a big ocean,” the academy has become “an important educational platform that is aiding in the enhancement and expansion of the role of pharmacy practice. Its work in benchmarking and promoting best practices in managed care pharmacy practice is extremely important.”

Further, Reissman relates, “some of the best friendships and most important working relationships I’ve ever enjoyed are with other members of AMCP.”
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Examination of Why Some Community Pharmacists Do Not Provide 72-Hour Emergency Prescription Drugs to Medicaid Patients When Prior Authorization Is Not Available

Marvin D. Shepherd, PhD

ABSTRACT

BACKGROUND: Existing federal law requires that a 72-hour emergency supply of a prescription drug be dispensed to Medicaid patients when prior authorization (PA) is not available and the medication is needed without delay. The pharmacist’s role is to contact prescribers and inform them that PA is needed. If the prescriber cannot be reached, the pharmacist can dispense a 72-hour emergency supply.

OBJECTIVES: To determine (a) the reasons why some community pharmacy owners/managers, staff pharmacists, and technicians are not compliant with the law; (b) how often the decision is made; and (c) estimate how often pharmacies do not dispense the 72-hour emergency supply when PA is not available.

METHODOLOGY: A questionnaire was mailed to selected Texas community pharmacies. The instrument was developed by the researcher and reviewed by the Texas Medicaid Vendor Drug Program staff. The University of Texas, Office of Survey Research collected the data in September and October of 2011 by mail and online. The data were forwarded to the researcher for analyses. A total of 788 identified community pharmacies were mailed a packet containing 3 questionnaires to be completed by the pharmacist-in-charge, a staff pharmacist, and a pharmacy technician. There were 2 mailings of the questionnaire packet and follow-up telephone calls to non-respondents.

RESULTS: A total of 653 questionnaires were completed and returned from 288 community pharmacies (36.7%) out of 788 pharmacies that were mailed the questionnaire packets. A total of 368 (57.5%) completed questionnaires came from chain store pharmacy respondents and 272 (42.5%) questionnaires from independent pharmacy respondents. A total of 21.3% (n = 134) of the respondents indicated that they were not aware of the federal and state requirement to dispense a 72-hour emergency supply of a prescription drug to Medicaid patients when prior authorization (PA) is not available. A greater proportion of the chain store respondents (26.6%) were unaware of the requirement compared with the independent pharmacy respondents (14.3%). A total of 77.7% of the respondents estimated that they make the decision of providing or not providing a 72-hour emergency supply of medication 6 or fewer times a month. A total of 14.6% indicated that they make the decision 6 to 11 times a month, and 7.7% make the decision more than 11 times a month.

When asked how often respondents had seen a 72-hour emergency prescription not being dispensed for Texas Medicaid recipients when PA was not available, 49.1% answered “never”; however, 30.0% indicated once or twice a month, 16.5% indicated from 1 to 5 times a week, and another 4.5% indicated more than 5 times a week. The top 2 reasons for not dispensing a 72-hour emergency drug supply were: “Reluctant to open a new ‘unit-of-use’ container (especially 30-day supply bottles)” and “The Rx will most likely be changed with the PA call, so why dispense a 72-hour supply of the originally prescribed drug?” The top categories of 72-hour emergency prescription drug products that respondents would “likely” dispense were antibiotics; inhaler canisters; products for nausea/vomiting; cough, and cold; antiseizure agents; and diabetic treatment products.

CONCLUSIONS: The results show that there are many factors why pharmacists do not provide 72-hour emergency medications when PA is unavailable. The lack of awareness of the federal and state requirements was significantly related to the frequency of 72-hour medications not being dispensed. In addition, other factors inhibiting the process were the pharmacists’ inability to reach physicians or the lack of cooperation with physicians, prescriptions for controlled substances, drug-packing limitations, and the financial risk involved with dispensing a 72-hour supply.

J Manag Care Pharm. 2013;19(7):523-33

What is already known about this subject

• No information or study could be found that documents the extent to which pharmacists or technicians follow the 72-hour emergency drug mandate, and no information or study could be found that documents the reasons why community pharmacists are reluctant to provide a 72-hour emergency drug supply for Medicaid recipients when prior authorization (PA) is not available.

What this study adds

• This study is the first that offers an insight into the concerns of pharmacists and technicians about providing a 72-hour emergency drug supply when PA approval was not accessible for Medicaid patients.
• The study found that 21.3% (n = 134) of the respondents were unaware of the requirement to provide a 72-hour drug supply when PA was unavailable. A greater proportion of the independent pharmacy respondents (85.7%) were aware of the requirement compared with chain store pharmacy respondents (73.4%). There was no difference in “awareness” when length of time in pharmacy practice was controlled.
Examination of Why Some Community Pharmacists Do Not Provide 72-Hour Emergency Prescription Drugs to Medicaid Patients When Prior Authorization Is Not Available

What this study adds (continued)

- A greater proportion of respondents who were “unaware” of the legal requirement reported seeing 72-hour drug supplies not being dispensed more often than the “aware” group of respondents. The top reasons why pharmacists and technicians do not provide a 72-hour emergency drug supply when PA is not available were: they do not dispense controlled substances, the medications were expensive, they do not provide products when they feel confident the product will be changed during the PA process, product packaging in containers/bottles hinders a 3-day supply being dispensed, prescriptions are from prescribers who work in emergency rooms or are difficult to locate, the medications are heavily abused or are street-popular drugs, and the request is for vitamins.
- The results found that pharmacists are very reluctant to dispense a 72-hour drug supply for prescriptions written by emergency room physicians. Comments written were: emergency room physicians are very difficult to locate, and it may take multiple calls and many days to get a return telephone call if they even return the call. Also, respondents mentioned many prescribers refuse to do PA, and many are not familiar with the PA process.
- These results point to the realization that pharmacists are not the sole source of the problem of lack of adherence with the 72-hour emergency prescription requirement; prescribers are “partners” in the problem and, in fact, may often precipitate the problem.

If the prescribing provider cannot be reached or is unable to request a PA, the pharmacy should submit an emergency 72-hour prescription. The request for an emergency 72-hour prescription claim should not be used for routine and continuous overrides.

A 72-hour emergency prescription will be paid in full to pharmacy providers and does not count toward the 3 prescription limit for adults who have not already received their maximum prescriptions for the month.2

PA requests can be done by fax, web, or telephone, and the MCO must notify the prescriber’s office of approval or denial within 24 hours. As mentioned, the MCO must provide full payment to the pharmacy provider for the 72-hour emergency prescription product.

Medicaid prescription drug claims data from November 2007 through October 2008 were used by the Texas Medicaid Vendor Drug Program (VDP) to identify high-volume PA pharmacies with no emergency claims and high-volume PA pharmacies with a below-average number of emergency claims. “High-volume” pharmacies were operationally defined as pharmacies that submitted an above-average number of claims requiring PA for nonpreferred prescription products. The analysis first identified the total number of prescription claims subject to nonpreferred PA and the total number of emergency claims for all pharmacies. The average number of claims for nonpreferred drugs and the average number of emergency claims were calculated. The average values for both parameters were not released to the researcher.

The Texas Medicaid VDP developed educational programs and communications for the identified pharmacies to inform and remind pharmacists and technicians about the 72-hour emergency supply requirement’s procedures and policies. Direct mailings and the VDP RxUpdate newsletter were mailed to community pharmacies, which explained the 72-hour emergency prescription requirement. Educational information was also placed on the VDP website. In addition, when VDP Medicaid auditors/inspectors visited community pharmacies, information was passed on to the pharmacists and technicians.

To obtain a deeper understanding of why pharmacies were not compliant with the law, the Texas VDP contacted the University of Texas, Center for Pharmacoeconomic Studies to conduct a study to determine pharmacist and technician perspectives on the 72-hour emergency requirement and to determine why some pharmacies do not provide the 72-hour emergency supply of medications.

Thus, the purpose of this study was to collect information as to the reasons why some Texas community pharmacies were not providing 72-hour emergency prescription drugs to Medicaid beneficiaries. The VDP wanted to know the perceptions of pharmacy owners/managers, staff pharmacists, and pharmacy technicians as to how often 72-hour emergency prescriptions are not being dispensed and to determine their

Existing federal law requires that a 72-hour emergency supply of a prescription drug be dispensed to Medicaid beneficiaries when the medication is needed without delay and prior authorization (PA) is not available.1 This law applies to Medicaid programs that are provided by the state or operated by private managed care firms. Not only is this a federal requirement but it is also a requirement of Texas law. In Texas, this rule applies to drugs not listed on the preferred drug list (PDL) and nonpreferred drugs listed on the preferred drug list and any drug that is affected by a clinical or PA edit.

The prescriber must obtain PA before the pharmacist can dispense the product. The role of the pharmacist is to contact prescribers and inform them that PA is needed before the prescription can be dispensed as written, and prescribers need to get the PA approval from the state or the private managed care organization. If the prescriber cannot be reached, the law states: “The 72-hour emergency supply should be dispensed any time a prior authorization is not available and a prescription must be filled, for any medication or medical condition.”

The wording from the Texas Medicaid Managed Care Handout is as follows:

“The prescriber must contact the client’s MCO (managed care organization) or PBM (pharmacy benefit manager) and follow MCO or PBM guidelines and procedures for prior authorization requests.”
perspectives on 72-hour emergency prescriptions. In examining the literature, no study was found documenting how often pharmacies did not dispense 72-hour emergency drug supplies to Medicaid patients, and no articles were found as to the reasons why 72-hour emergency supply were not dispensed. There were many articles and web postings citing the legal requirements of the 72-hour emergency drug supply. The purpose of this research was to provide insight as to why some pharmacists and technicians do not provide a 72-hour emergency drug supply when PA cannot be attained.

Methods

The study design was a survey that used a self-administered questionnaire. Questionnaire packets were mailed to community pharmacies identified by the Texas VDP as not being “fully compliant” with the mandate of providing a 72-hour emergency supply of the medication when PA was not available. Each questionnaire packet mailed to the pharmacies contained 3 color-coded questionnaires: 1 questionnaire was to be completed by the pharmacist-in-charge or owner/manager of the pharmacy, 1 questionnaire was designed for a staff pharmacist employee, and 1 questionnaire was for a pharmacy technician employee. The packet also contained a cover letter that was addressed to the pharmacist-in-charge or owner/manager, explaining the purpose of the study and instructions as to how to distribute the questionnaires to employees. Each questionnaire within the packet had a return-address, postage-paid envelope attached.

The questionnaire was developed by the researcher. A draft version of the questionnaire was forwarded to the Texas VDP to solicit their input, suggestions, and comments. VDP personnel provided useful comments and suggestions, and revisions were made to the instrument. It was resubmitted to VDP for approval. A copy of the final questionnaire can be found in Appendix A (available in online article).

The instrument contained 23 closed-ended items and 2 items that asked for years of practice experience and years of employment at their current pharmacy. It also included 2 open-ended items: 1 asked if the type of drug product prescribed influenced their decision to either dispense or not dispense the 72-hour emergency supply, and 1 asked if there were any internal or corporate business practices/rules that impede the pharmacy from dispensing a 72-hour emergency supply. Respondents were asked to estimate the number of times in the last month they had seen when the drug product dispensed for the 72-hour emergency supply for Medicaid recipients was changed to a different product after PA was obtained. In an open-ended question, respondents were asked to give suggestions on how VDP could improve their educational efforts about the 72-hour emergency medication supply program. Each questionnaire had a unique identification number at the top of the instrument that identified the community pharmacy.

This number facilitated the reminder mailings and follow-up telephone calls. The study was approved by the University of Texas Institutional Review Board.

Data Collection

The University of Texas, Office of Survey Research (OSR) was contracted by the Texas Medicaid VDP to collect the data from the managers/owners, community pharmacists, and technicians. The Texas VDP provided OSR with a list of addresses and telephone numbers for 801 pharmacies that VDP identified as not being fully compliant with the 72-hour emergency prescription law. OSR sent the mailing list to the U.S. Post Office for address verification. Two pharmacy addresses could not be verified so the questionnaire packets were mailed to 799 pharmacies. This sample represented 16.7% of the community pharmacies in Texas (n = 4,787) in 2011. A total of 2,397 questionnaires were contained in the 799 community pharmacy mailings. In addition, respondents could complete the instrument online via a dedicated website developed by OSR. The website address was provided in the cover letter.

Data collection took place in September and October of 2011. First-class postage was used to mail the packets. Reminder letters, along with questionnaires, were sent to non-respondent pharmacies 3 weeks after the initial mailing. This was followed-up 3 weeks later by a telephone call reminder. If requested, a questionnaire was faxed to the pharmacies.

The data collected were checked for completeness, entered into a computer file by OSR, and forwarded to the researcher for analysis. OSR provided the data in Excel format on November 17, 2011. The data were transposed and analyzed using SPSS version 18 software (SPSS Inc., Chicago, IL). When t-test and chi-square statistical tests were conducted, an alpha level of 0.05 was employed.

Results

Response Rates

Of the 799 questionnaire packets, 16 packets (48 questionnaires) were returned to the sender stamped as “not deliverable,” “nonacceptance,” “incorrect addresses,” or “forwarding address expired.” Thus, a total of 783 packets, or 2,349 questionnaires, were assumed to have been delivered.

The data set received from OSR had a total of 653 questionnaires from 288 community pharmacies. Appendix B (available in online article) presents a flowchart of the responses. Based on the number of community pharmacies, the response rate was 36.8% (288/783). Based on the number of questionnaires mailed, the response rate was 27.8% (653/2,349). A total of 20.5% (n = 134) of the questionnaires were returned through the Internet, using the web-based questionnaires, while the remaining 79.5% (n = 519) of the questionnaires were returned via mail or faxed. Of the 288 pharmacies that received questionnaires, a total of 161

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(55.9%) represented chain store pharmacies, 121 (42.0%) represented independent pharmacies, and 6 (2.1%) were classified as “Other.” “Other” pharmacies were outpatient pharmacies in a clinical setting, mail-order pharmacies, and long-term care pharmacies. Based on the number of questionnaires received from each pharmacy, 140 (48.6%) pharmacies provided 3 responses per pharmacy, 85 (29.5%) pharmacies provided 2 responses per pharmacy, and 63 (21.9%) pharmacies provided only 1 response per pharmacy.

The response rate based on pharmacy position was difficult to determine because it was not known if every pharmacy surveyed employed a staff pharmacist or a technician. In fact, the researcher received calls from pharmacies asking what to do since they did not employ a pharmacy technician and/or a staff pharmacist.

With regard to who completed the instrument, a forced-choice questionnaire item listed 6 levels of positions. Table 1 depicts the responses by pharmacy position, controlling for type of pharmacy. The Texas VDP staff requested this information because they wanted to examine the data by pharmacy position; they wanted to know if there were differences in perceptions by position.

There were a total of 368 (57.5%) completed questionnaires from chain store pharmacy respondents and 272 (42.5%) completed questionnaires from independent pharmacy respondents. Pharmacists-in-charge represented the largest component (37.2%), followed by staff pharmacists (25.4%). Together, these 2 categories represented 62.6% of the responses. A total of 24 “owners” completed the instrument. When the categories of “owners” are combined with “pharmacist-in-charge” for independent pharmacies, the total is 112, which represents 41.2% of the independent pharmacy responses. This is very similar to the 40.2% of the chain store respondents who responded as “pharmacist-in-charge.” Pharmacy technicians represented 33.7% (n = 220) of all responses. Pharmacy technicians represented 31.6% of the chain store pharmacy responses and 36.8% of the independent pharmacy responses.

Respondents who answered “owner” (n = 24) were consolidated with those who indicated that they were the “pharmacist-in-charge” (n = 243), resulting in 267 responses. Both the lead technician positions and staff-level technicians were consolidated to form 1 group called “technicians” (n = 220). The staff pharmacist-level position remained the same, with 166 respondents. Since there were only 13 respondents who indicated “Other” for practice setting, this group of respondents was excluded for most analyses.

### Awareness of the 72-Hour Emergency Prescription Rules

Respondents were asked: “Are you aware that federal and Texas law requires that a 72-hour emergency supply of a prescribed drug be provided to Medicaid patients when prior authorization is not available?” Table 2 depicts the results, controlling for practice setting. A total of 78.7% of the respondents (n = 495) were aware that federal and Texas law required the dispensing of a 72-hour emergency supply. However, 21.3% of the respondents (n = 134) were not aware of the requirement. A greater proportion of the independent pharmacy respondents (85.7%) were aware of the requirement compared with chain store pharmacy respondents (73.4%), and this was statistically significant, using a chi-square Fisher exact test ($\chi^2 = 13.86; P = 0.001$).

Appendix C (available in online article) presents the results about “awareness,” controlling for practice setting and pharmacy position. A total of 80.5% of the “pharmacists-in-charge” from independent community pharmacies were aware of the requirement compared with 75.5% of the chain store pharmacies “pharmacists-in-charge.” However, this difference was not statistically significant ($\chi^2 = 3.418; 1.6\%$).
For staff pharmacists, there was a statistically significant difference between the settings. A total of 87.9% of the independent pharmacy staff pharmacists were aware of the requirement compared with 66.0% of the staff pharmacists from chain store pharmacies ($\chi^2 = 9.188; P = 0.002$). In other words, close to one third of the chain store staff pharmacists were not aware of the regulatory requirement. For technicians, a total of 14.1% (n = 14) of the independent pharmacy technicians were not aware of the rule compared with 22.9% (n = 25) of the chain store technicians. This result for technicians was not statistically significant ($\chi^2 = 2.634; P = 0.105$).

Appendix D (available in online article) depicts the relationship of length of time in pharmacy practice and “awareness.” The results show that “awareness” of the regulation did not change, controlling for the length of pharmacy practice experience. Approximately 20% of the respondents in each of the length of time practice categories were unaware of the law.

### Frequency of Decisions for Dispensing a 72-Hour Emergency Prescriptions

Table 3 shows how often pharmacy employees make a decision about dispensing a 72-hour emergency drug supply. The wording of the item was: “In the last month, please estimate how often you made the decision about providing a 72-hour emergency prescription for Medicaid recipients.” This closed-ended question had 4 answer choices: (1) less than 6 times last month, (2) 6 to 10 times last month, (3) 11 to 20 times last month, and (4) more than 20 times last month. A total of 79.0% of the chain store respondents and 76.9% of the independent pharmacy respondents indicated that the decision to provide 72-hour emergency prescriptions was made less than 6 times in the last month. No statistically significant difference was found when controlling for practice setting ($\chi^2 = 5.574; P = 0.134$).

### How Often Have You Seen the 72-Hour Emergency Prescription Not Being Used?

Respondents were asked: “At your pharmacy, in the last 30 days, please estimate how often you have seen the 72-hour emergency prescription NOT being used for Texas Medicaid recipients when prior authorization was not available.” Table 4 depicts the results controlling for practice position. Of all the respondents, about half (49.5%) reported “never” in the last 30 days and 30.0% (n = 194) reported “once or twice” in the last 30 days. Eight percent (n = 52) indicated “once a week” and 8.5% (n = 55) respondents reported “2 to 5 times a week.” The remaining 4.3% (n = 28) respondents reported “5 or more times a week.” There was no statistically significant difference when controlling for pharmacy position.

### Does Type of Drug Influence the Decision?

Respondents were asked: “In your opinion, does the type of drug influence the decision on whether or not a 72-hour emergency supply will be dispensed?” A total of 52.5% (n = 340) of the respondents indicated yes and 47.5% (n = 308) indicated no.

If the respondent answered yes, respondents were asked in an open-ended question to give examples of drug products that would influence their decision as to whether or not a 72-hour emergency supply would be dispensed. A total of 322 responses were submitted: 135 responses from pharmacists-in-charge, 84 responses from staff pharmacists, and 103 responses from pharmacy technicians.

Analyzing the open-ended item was problematic because...
many responses were cryptic in nature to the point that many were incomprehensible. Also, in some cases, it was difficult to determine if the respondent would or would not dispense the product mentioned. In addition, some respondents wrote multiple comments or gave many examples. Despite these shortcomings, the understandable responses provided a valuable insight.

The open-ended responses were categorized into topic areas based on the frequency of the response written. A total of 15 topic areas were identified. Responses that were incomprehensible or infrequent were placed in the “Other” category.

When respondents wrote more than one product or one response, each answer was broken down into multiple categories. Thus, there were a total of 425 different answers from the 322 respondents. Appendix E (available in online article) depicts the top categories and frequencies in decreasing order, controlling for pharmacy position.

When the “Other” category is excluded, the top 5 categories received 59.0% of the “mentions.” The top category, “controlled substances,” received 92 mentions (21.6%), and the distribution was fairly consistent across pharmacy practice positions. Most of the controlled substance mentions concerned either the regulatory issues or the abuse/misuse potential. The following are examples of the comments:

“CII (Schedule II Controlled Substances) medications. This process also creates a billing problem for future fills. Dispensing less than prescribed gives a billing error upon refill and requires multiple steps to correct.” (pharmacist-in-charge)

“CII meds. Once we fill 3-day supply for patient, the remaining balance of Rx is void and patient will need to get a new hardcopy.” (pharmacy technician)

“Controlled substances make us stop and evaluate the patient, drug and usage.” (pharmacist-in-charge)

“CII scripts. Pharmacists don’t like partials.” (pharmacist-in-charge)

These results show that pharmacists and technicians do not like or are hesitant to dispense 72-day emergency supplies for controlled substances.

The second most frequent category of mention was antibiotic/anti-infective products. There were 46 responses in this category, with many respondents just writing the word “antibiotics” or a specific product name without an explanation. Some respondents wrote that they would fill a 72-hour quantity for an antibiotic whereas some wrote they would not because the prescription may be changed after the PA call.

The category “packaging presents difficulty” received the third most frequent number of “mentions.” This category relates to how the pharmaceutical product is packaged or bottled. For some products, it is impossible to open the container to dispense a 72-hour supply (i.e., insulin vials, inhalers, eye/ear drops). Another example is when manufacturers use unit-of-use packaging, where the product packages/containers have a fixed number of days of therapy such as blister packaging or other types of fixed-day vial/bottle/container. Liquid products, creams, ointments, and lotions also have limitations because it is extremely difficult to remove just a 72-hour supply. Examples of comments written were:

“If the drug package only comes in a certain quantity ... like 30 or 90 pills or tablets ... we do not break the package. Also ... how are you supposed to give a 72-hour supply of an inhaler or nebulizer solution?” (pharmacist-in-charge)

“Medications that cannot be broken from original box/container; eye drops, ear drops.” (pharmacist-in-charge)

“Sometimes if a bottle is sealed, it’s difficult to dispense a 3-day supply. The pharmacy will be left with a partial bottle in stock, and if the patient doesn’t return, the pharmacy is stuck with inventory.” (pharmacist-in-charge)

“Drugs that come prepackaged that would require you to break the package. Then when the doctor is available and changes the medication (which is what usually happens), we are left with the remainder of the package to sit on our shelf.” (pharmacy technician)

“Depends on the packaging. Most pharmacists do not feel comfortable breaking a full box for just 3 days. The physician will not call for a PA, and the product stays there to expire.”

The category that received the fourth most frequent mentions was “inhalers.” It received 38 responses (8.9%). Respondents either wrote “inhalers” or wrote a specific product name. Respondents indicated that they will dispense this product in an emergency situation.

The fifth-ranked category of comments was titled “expensive.” If the respondent viewed the drug product as being costly, they were less inclined to dispense a 72-hour supply of the product. The thinking was that the product would not be approved for PA so why dispense a 72-hour supply of an expensive medication when a generic or less costly product will most likely be prescribed. Examples of types of products that they would not be inclined to dispense are:

“A very expensive narcotic or a very expensive medication that can be easily substituted with another less expensive medication.”

“High-dollar medications and controlled substances.”

“Expensive antibiotics that are reconstituted and then are changed by prescriber to another antibiotic that does not require prior authorization.”

“High-price items and package-sized ones are a waste of money knowing that the prescription will be changed.”
There were responses that made it difficult to determine if the product(s) mentioned were “likely” or “unlikely” to be dispensed as a 72-hour emergency prescription. The following categories/comments were interpreted by the researcher as being “likely” candidates for the dispensing of a 72-hour emergency supply:

- antibiotic products
- inhalers
- medications for nausea and vomiting
- cough and cold medications
- diabetes treatment products
- eye drops or ear drops
- antiseizure medications
- emergency or urgent care use products

Product categories or comments that were interpreted as being “unlikely” candidates for dispensing of a 72-hour emergency supply were:

- controlled substances
- expensive medications
- product packaging in containers/bottles that make it difficult to dispense a 3-day supply
- prescriptions from prescribers who work in emergency rooms or prescribers who are difficult to locate
- heavily abused medications or street popular drugs
- vitamins
- over-the-counter medications

### Reasons for Not Dispensing 72-Hour Emergency Prescriptions

Respondents were asked: “Please indicate the significance/importance of each of the possible reasons/factors as to why 72-hour emergency prescriptions are not being dispensed to eligible Medicaid beneficiaries in your pharmacy?” We used a 5-point rating scale:

1. Very high significance/very high importance factor
2. Moderate significance/moderate importance factor
3. Low significance/low importance factor
4. Very little significance/very little importance factor
5. Not significant/not an important factor

Thus, the lower the score value, the higher the significance/importance rating. Table 5 lists the reasons/factors and the results (the Table 5 Appendix, available in online article, lists reasons/factors in the “Other category”).

The factor that had the lowest mean score and thus the highest significance/importance rating was “Reluctant to open a new “unit-of-use” container (especially 30-day supply bottle).” Two reasons had the same mean scores for the second lowest score and these were: “The pharmacist believes the prescription will most likely be changed with the prior authorization call, so why dispense a 72-hour supply of the originally prescribed drug” and “The patient decided to wait to have the prescription filled at a later time.” The 2 reasons with the highest mean score and thus the lowest score on the importance rating were: “Dispensing a 72-hour emergency supply takes too much time” and “Dispensing a 72-hour emergency supply is not encouraged by pharmacy or corporate management.”

### TABLE 5

<table>
<thead>
<tr>
<th>Reasons/Factors for Not Dispensing 72-Hour Emergency Prescriptions</th>
<th>Rating of Significance/Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very High n (%)</td>
</tr>
<tr>
<td>1. The pharmacist felt the prescribed drug product was not essentialb</td>
<td>104 (16.5)</td>
</tr>
<tr>
<td>2. The Rx will most likely be changed with the prior authorization call, so why dispense a 72-hour supply of the originally prescribed drugb</td>
<td>143 (22.6)</td>
</tr>
<tr>
<td>3. The pharmacist was reluctant to open a new “unit-of-use” container (especially 30-day supply bottles)b</td>
<td>189 (30.0)</td>
</tr>
<tr>
<td>4. Pharmacists or technicians do not fully understand the legal or processing procedures of a 72-hour emergency supply claim</td>
<td>71 (11.3)</td>
</tr>
<tr>
<td>5. Dispensing a 72-hour emergency supply takes too much timeb</td>
<td>15 (2.4)</td>
</tr>
<tr>
<td>6. The patient decided to wait to have the prescription filled at a later timeb</td>
<td>127 (20.3)</td>
</tr>
<tr>
<td>7. Dispensing a 72-hour emergency supply is not encouraged by pharmacy or corporate managementb</td>
<td>26 (4.1)</td>
</tr>
<tr>
<td>8. Texas Medicaid prior authorization processes and 72-hour emergency supply procedures are confusing when compared with other third-party pay plansb</td>
<td>56 (8.9)</td>
</tr>
<tr>
<td>Otherc</td>
<td>44 (44.0)</td>
</tr>
</tbody>
</table>

*Respondents rated the factors on a scale of 1-5, 1 being very significant, 5 being not at all significant or not important.

bThere was no significant difference in how respondents rated the significance/importance of this factor, controlling for pharmacy position.

cOther reasons/factors are listed in the Table 5 Appendix, which is available in the online article.

Rx = prescription.
There were no statistically significant differences for each of the reasons when controlling for pharmacy position.

**Extent of Corporate or Internal Business Practices or Rules**

Respondents were asked, “Are there any pharmacy internal or corporate business practices or rules used that may impede your pharmacy from dispensing 72-hour emergency prescriptions for Medicaid recipients?” A total of 97.5% (n = 632) indicated no. Only 16 respondents (12 chain employees and 4 independent employees) indicated yes. Those who answered yes were asked to explain their response, and the following comments were made:

“The pharmacy won’t be reimbursed for products dispensed that the doctor later won’t authorize, and we end up with a loss for the item. The pharmacy has to order products that later won’t be covered and we cannot return the products.”

“It is our policy to avoid dispensing partial prescriptions on controlled substances or narcotics. Again, these are examined case by case.”

“Emergency prescriptions are not dispensed if an ER doctor has written the script. Most ER doctors do not do PA.”

“No company wants to lose money. We hesitate to waste a unit-of-use package when we won’t be reimbursed if prescription is changed.”

“Doctors take too long, sometimes a week or longer to get back with the OK.”

“When you call the doctor for a prior authorization, they take at least 4 business days to respond and 99% of the time the doctor changes the product.”

“Corporate is concerned about the cost of inventory and if, for example, a patient needs Xopenex nebules (or prepackaged meds), then we cannot get rid of the rest and we are stuck with a partial quantity of a very expensive medication.”

“Controlled substances when prescribing physicians’ numbers are not provided and cannot be verified.”

“If entered for a 72-hour supply, then Rx has to be entered a second time for info to be faxed to Dr.”

“We want to make sure we are reimbursed for all meds.”

“The medication is out-of-stock.”

“If it is a brand name, we always encourage generic.”

“I have heard other pharmacists don’t always want to dispense a high-dollar medication because it might not get paid for by Texas Medicaid at a later date.”

“Both; if it’s a multi-use vial that will last beyond the 72 hrs.—but can’t be broken—then we are falsely stating a 3-day supply on something that lasts up to 30 days or longer, for example.”

“Breathing treatments and anti-emetics are allowed. Cough suppressants are usually changed to something else as are prenatal vitamins.”

One common theme from the above-listed reasons was the cost risk for the pharmacy. One cost risk is the threat of not being reimbursed for the product, and another cost risk is being left with a partial supply of an expensive drug in a unit-of-use. The second expressed theme was that prescribers are difficult to reach, do not return calls, don’t do PA, or, in general, do not have a good understanding of the PA process.

**Product Changes After PA Call**

An open-ended question was asked: “Please estimate the number of times in the last month you have seen when the drug product dispensed for the 72-hour emergency supply for Medicaid recipients was changed to a different product after prior authorization was obtained.” The results are presented in Appendix F (available in online article), controlling for pharmacy type and position level. A total of 75 respondents failed to answer this question.

Overall, the average number of times in the last month that the prescription was changed after PA was 3.04 times, and the average for chain store employees was slightly higher than respondents from independent pharmacies. However, there was no statistically significant difference between chain store and independent employees. When looking at the results, controlling for pharmacy position, pharmacist-in-charge had the highest mean number of times (3.55), followed by staff pharmacist (3.20) and technicians (2.31). Using a 1-way analysis of variance, there no statistically significant difference between the means, controlling for position (F = 1.802; P = 0.166).

**Discussion**

The intent of the 72-hour emergency medication law was to provide access to prescription medication(s) during those times when the decision for PA cannot be obtained. The Texas VDP determined that when the decision of PA could not be obtained, the 72-hour emergency drug supply was not always provided and VDP wanted to know why. This study found that more than 16% of the respondents indicated that not providing the 72-hour emergency drug supply occurs 1 to 5 times a week, and another 30% indicated that it happens once or twice a month. This is in direct conflict with the intent of the law.

One possible explanation for the poor compliance with the law was that 21.3% of the respondents were unaware of the state and federal requirements. A total of 26.6% of the chain store pharmacy employees were unaware of the requirements compared with 14.3% of the independent pharmacy employees. More startling was that a total of 34.0% of the chain store staff pharmacists were unaware of the law’s requirements compared with 12.1% of the independent staff pharmacists. A similar pattern held for technicians. Table 6 shows a statistically
Table 6: The Number and Proportion of Respondents Who Witnessed 72-Hour Emergency Prescriptions Not Being Dispensed in the Last 30 Days, Controlling for “Awareness” of the Law for Independent and Chain Store Respondents

<table>
<thead>
<tr>
<th>Number of Times</th>
<th>All Respondents N (%)</th>
<th>Yes n (%)</th>
<th>No n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>310 (49.3)</td>
<td>261 (52.7)</td>
<td>49 (36.6)</td>
</tr>
<tr>
<td>Once or twice a month</td>
<td>190 (30.2)</td>
<td>154 (31.1)</td>
<td>36 (26.9)</td>
</tr>
<tr>
<td>Once a week</td>
<td>50 (7.9)</td>
<td>38 (7.7)</td>
<td>12 (9.0)</td>
</tr>
<tr>
<td>2 to 5 times a week</td>
<td>52 (8.3)</td>
<td>32 (6.5)</td>
<td>20 (14.9)</td>
</tr>
<tr>
<td>Greater than 5 times a week</td>
<td>27 (4.3)</td>
<td>10 (2.0)</td>
<td>17 (12.7)</td>
</tr>
<tr>
<td>Total*</td>
<td>629 (100.0)</td>
<td>495 (100.0)</td>
<td>134 (100.1)</td>
</tr>
</tbody>
</table>

*There was a statistically significant difference using chi-square analysis (χ² = 45.05; p = 0.001).

significant relationship between “awareness” of the law and the number of times the respondents witnessed 72-hour emergency drug supplies not being dispensed (χ² = 45.05; df = 4; p = 0.001). A greater proportion of the “unaware” respondents reported seeing 72-hour drug supplies not being dispensed more often than the “aware” group of respondents. For example, 12.7% (n = 17) of the “unaware” respondents reported seeing 72-hour supplies not be dispensed 5 or more times a week versus 2.0% (n = 10) of the “aware” respondents, and 14.9% (n = 20) of the “unaware” respondents had observed 72-hour emergency prescriptions not be dispensed 2 to 5 times a week compared with 6.5% (n = 32) of the “aware” respondents. Although a greater proportion of the “unaware” respondents reported observing the 72-hour prescriptions not being dispensed, close to a third (31.1%) of the “aware” respondents reported seeing the occurrence once or twice a month.

These results were found after the education programs about the law were provided by the Texas VDP to pharmacists and technicians. VDP mailed educational materials to pharmacies, and educational information was placed in the VDP RxUpdate newsletter. In addition, educational material was placed on the VDP website. Finally, when VDP inspectors/auditors visited community pharmacies, additional educational materials were provided. An “awareness” assessment was not made prior to these education programs so the impact of the educational programming is unknown, but based on this study’s results, it appears that additional educational programming is needed.

The results also suggest that education programs need to be provided to both independent and chain store pharmacy practice environments, with a major effort made for chain drugstore employees. One out of every 3 chain store staff pharmacists was unaware of the 72-hour emergency drug requirement. In the researcher’s opinion, this educational responsibility does not solely lie upon the State of Texas. The Texas Medicaid program was moved over to the managed care arena on March 1, 2012, so the educational responsibilities are shared with managed care firms, insurance firms, VDP, corporate pharmacy management, and pharmacy associations. This research also found a variety of reasons why respondents are not always compliant in providing 72-hour emergency medications when PA process is not accessible. The following list provides a brief description of the various reasons:

1. Some drug packaging or drug containers make it difficult to dispense a 72-hour supply. It is impractical to dispense a 72-hour supply of insulin or an inhaler. In addition, pharmacists are reluctant to break open a “unit-of-use” package such as blister packs or a 30-day supply container to dispense a 72-hour drug supply. If the PA is not obtained, the pharmacy will most likely be stuck with a bottle containing 27 days of product that cannot be returned to the wholesaler and most likely will not be sold. Thus a pharmacy will suffer financial loss.

2. Many respondents mentioned that they do not dispense a 72-hour supply of a controlled substance. This is not only associated with abuse and diversion potential; if a 72-hour supply of a controlled substance is dispensed, the prescription is categorized as “filled,” and the patient will need to get a new prescription in order to obtain the remaining medication.

3. There was a threat that the prescription will be changed to another product, probably a less expensive product, after contact is made with the prescriber for the PA. Thus, the utility of dispensing a 3-day supply of a more expensive product is questioned, and it is better to wait and get the more economical product to the patient.

4. After the pharmacist explains to the patient that PA approval is required and that there is a good chance that the prescription will be changed, the patient may just decide to wait and get the medication later, after the physician has been called.

Obviously, there are some disadvantages or health risks when patients wait and do not start their medications on time. The patient’s health may deteriorate and thus require additional medical attention such as added emergency department visits, physician visits, or hospitalizations. Thus, the decision to wait or not to provide the 72-hour emergency drug supply may have severe unintended consequences, which is why many respondents provided many examples of 72-hour emergency drug products that they would provide. These included inhalers, medications for nausea and vomiting, antiseizure medications, cough and cold medications, products to treat diabetes, and ear and eye drops.

Respondents also provided examples of 72-hour emergency drug products that they were reluctant to dispense. Examples
given were controlled substances, heavily abused medications, drugs packaged in containers where a 3-day supply is hindered, expensive medications, over-the-counter medications, and vitamins.

Another factor mentioned as to why respondents do not provide 72-hour drug supplies was that many will not dispense a 72-hour drug supply for prescriptions written by emergency room physicians. The problem with emergency room physicians is that they are very difficult to reach, it may take multiple telephone calls, and many times it takes several days to get the physician to return the telephone call if they eventually do return the call. Finally, it was mentioned that some physicians refuse to do PA requests, and many are not familiar with the PA process.

The results show that there are some legitimate reasons why 72-hour emergency drug supplies are not provided. The results also show that pharmacists are not the sole source of the problem of lack of adherence to the 72-hour emergency prescription requirement. Prescribers are “partners” in the problem and, in fact, in many cases, physicians precipitate the problem. In the researcher’s opinion and based on the comments obtained from the questionnaires, it appears that many pharmacists are just tired of dealing with unreachable or uncooperative physicians, especially emergency room physicians. Educational efforts must reach out to this physician community.

Limitations
This study has limitations that may affect the generalizability of the results. The results should not be generalized nationally or to all Texas pharmacies/pharmacists/technicians because the sampling methodology employed only sampled those pharmacies that were identified by the Texas VDP as having a below-average number of PA prescriptions. Despite multiple mailings and follow-up phone calls, nonresponse bias is still a threat. Furthermore, the methodology asked the pharmacist-in-charge/manager to distribute the questionnaires to a staff pharmacist and a pharmacy technician. The pharmacist-in-charge was to complete the third questionnaire. How the pharmacist and technician were selected is unknown. This was most likely a convenience sample and not a random selection. That is, whoever was on duty at the time the questionnaires were being distributed probably received the questionnaire. Another possibility is that the pharmacist-in-charge selected people who he/she thought were the “most knowledgeable” or perhaps “the more favorable” or who could provide the “best” response. Finally, although questionnaire items were pretested and the items were reviewed many times by various people, respondents may not have interpreted the item(s) or question(s) as intended by the researcher or the VDP.

It is recognized that perceptions and opinions change or evolve over time. It is possible that the views expressed in this study may not be the same if the study were to be conducted today. It is also possible that in reading the instrument, respondents’ knowledge, opinions, and views changed as they completed the questionnaire. So the results expressed may not have been their perceptions prior to completing the instrument.

Conclusions
The results show that the issue of not providing 72-hour emergency medication when PA is unavailable is multifaceted. The problem of the lack of awareness of the federal and state requirements regarding this law can and should be addressed through educational programming dedicated to community pharmacists, pharmacy technicians, physicians, and especially to emergency room physicians. The results show that there are some legitimate reasons why 72-hour emergency drug supplies are not dispensed. The issue of drug packaging, especially for expensive medications in unit-of-use packaging, was frequently cited. Clearly, as this study points out, writing a simple blanket law may sound good, but when it comes to its implementation, unintended consequences will arise.

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REFERENCES


72-Hour Emergency Prescription Questionnaire

The Texas Medicaid/CHIP Vendor Drug Program (VDP) wants to know your opinion and understanding of the Dispensing 72-Hour Emergency Prescriptions to Medicaid recipients policy and procedures. Please answer the following questions and items and return the questionnaire in the provided addressed envelope. Your cooperation is appreciated. Thanks.

1. In the last month, please estimate how often you made the decision about providing a 72-hour emergency prescription for Medicaid recipients?
   A. _____ Less than 6 times last month
   B. _____ 6 to 10 times last month
   C. _____ 11 to 20 times last month
   D. _____ More than 20 times last month

2. In your opinion, is dispensing a 72-hour emergency prescription supply to a Medicaid recipient a problem?
   A. _____ No
   B. _____ Yes

2a. If yes, to what extent is it a problem?
   A. _____ A slight problem (problem rarely occurs)
   B. _____ A moderate problem (problem occurs once or twice a month)
   C. _____ A serious problem (problems are common (weekly or more often)

3. Do you recall receiving educational materials, (brochures, postcards, faxes or online materials) in the last six months about the Texas Medicaid 72-hour emergency prescription program and procedures?
   A. _____ Yes
   B. _____ No—Please proceed to question 4
   C. _____ Can’t remember—Please proceed to question 4

3a. If Yes, how did you receive the information?
   A. _____ Texas Vendor Drug program website
   B. _____ Letter sent directly to the pharmacy
   C. _____ Information distributed by the pharmacist-in-charge
   D. _____ E-mail message from Texas Vendor Drug Program
   E. _____ Message from the claims processor, after submitting a claim
   F. _____ Information from the RxUpdate newsletter
   G. _____ Other, please specify: ____________________________________________

3b. Using the following scale, how would you rate the Texas educational materials about the 72-hour emergency prescription drug program?
   A. _____ Excellent
   B. _____ Very good
   C. _____ Average
   D. _____ Poor
   E. _____ Do not recall

3c. If “average” or “poor,” do you have any suggestions on how the educational efforts can be improved? ________________________________________________
   ________________________________________________

4. Are you aware that federal and Texas law requires that a 72-hour emergency supply of a prescribed drug be provided to Medicaid patients when prior authorization is not available?
   A. _____ Yes
   B. _____ No

5. Using the following scale, in general, how knowledgeable are the pharmacists you work with about the Texas Medicaid 72-hour emergency prescription policy and procedures?
   A. _____ Knowledgeable
   B. _____ Somewhat knowledgeable
   C. _____ Not very knowledgeable
6. Using the following scale, in general, how knowledgeable are the pharmacy technicians you work with about the Texas Medicaid 72-hour emergency prescription policy and procedures?
   A. ______ Very knowledgeable  
   B. ______ Somewhat knowledgeable  
   C. ______ Not very knowledgeable

7. At your pharmacy, in the last 30 days, please estimate how often you have seen the 72-hour emergency prescription NOT being used for Texas Medicaid recipients when prior authorization was not available?
   A. ______ Never  
   B. ______ Once or twice a month  
   C. ______ Once a week  
   D. ______ Two to five times a week  
   E. ______ Greater than five times a week

8. In your opinion, does the type of drug influence the decision on whether or not a 72-hour emergency supply will be dispensed?
   A. ______ Yes  
   B. ______ No

   8a. If yes, please give examples of drug products:
       ________________________________________________________________________________________
       ________________________________________________________________________________________
       ________________________________________________________________________________________
       ________________________________________________________________________________________
       ________________________________________________________________________________________

9. Are there any pharmacy internal or corporate business practices or rules used that may impede your pharmacy from dispensing 72-hour emergency prescriptions for Medicaid recipients?
   A. ______ Yes  
   B. ______ No

   9a. If yes, please explain:
       ________________________________________________________________________________________
       ________________________________________________________________________________________

10. Please estimate the number of times in the last month you have seen when the drug product dispensed for the 72-hour emergency supply for Medicaid recipients was changed to a different product after prior authorization was obtained.

   Number of times per month the drug product changed: __________________

11. Using the following 5-point significance/importance rating scale, please write the number indicating the significance/importance rating in the space provided for each of the possible reasons/factors as to why 72-hour emergency prescriptions are not being dispensed to eligible Medicaid beneficiaries in your pharmacy?

   1. Very high significance/very high importance factor  
   2. Moderate significance/moderate importance factor  
   3. Low significance/low importance factor  
   4. Very little significance/very little importance factor  
   5. No significance/not an important factor

   A. ______ In the pharmacist’s professional opinion, the prescribed drug product was not essential (i.e., cough and cold product).
   B. ______ The pharmacist believes the prescription will most likely be changed with the prior authorization call, so why dispense a 72-hour supply of the originally prescribed drug.
   C. ______ The pharmacist is reluctant to open a new “unit-of-use” container (especially 30-day supply bottle) and render the product size unusable for future patients.
   D. ______ Pharmacists or technicians do not fully understand the legal or processing procedures of a 72-hour emergency supply claim.
   E. ______ Dispensing a 72-hour emergency supply takes too much time.
   F. ______ The patient decided to wait to have the prescription filled at a later time.
   G. ______ Dispensing a 72-hour emergency supply is not encouraged by pharmacy or corporate management.
   H. ______ Texas Medicaid prior authorization processes and 72-hour emergency supply procedures are confusing when compared to other third-party pay plans.
   I. ______ Other, please describe: ________________________________________________________________

Please proceed to next page
APPENDIX A  Opinions and Knowledge of the Texas Medicaid/CHIP Vendor Drug Program (continued)

Demographic Information

1. Which of the following best describes your pharmacy practice work environment?
   A. ______ Independent community pharmacy
   B. ______ Chain store pharmacy (five or more stores)
   C. ______ Other, please describe: ______________________________________________________________________
   __________________________________________________________________________________________

2. From the following choices, mark the one that best depicts your position at the pharmacy where you are employed.
   A. ______ Pharmacist-in-charge
   B. ______ Staff pharmacist
   C. ______ Pharmacy owner
   D. ______ Lead pharmacy technician
   E. ______ Staff pharmacy technician
   F. ______ Other, please specify: ______________________________________________________________________
   __________________________________________________________________________________________

3. How long have you been employed at this pharmacy?
   _______ years and ________ months

4. How long have you been practicing pharmacy or working as a pharmacy technician?
   ________ years

Thanks for completing the questionnaire. Your input is very valuable to us. We are very appreciative.
Examination of Why Some Community Pharmacists Do Not Provide 72-Hour Emergency Prescription Drugs to Medicaid Patients When Prior Authorization Is Not Available

### Appendix B

**Flowchart of Sample**

1. **Pharmacies Identified by Texas Vendor Drug Program as Not Fully Compliant**
   - n = 801

2. **Two Pharmacy Addresses Not Verified by U.S. Post Office**
   - n = 799

3. **16 Questionnaire Packets Were “Not Deliverable,” “Not Accepted” or Had “Incorrect Address”**
   - n = 783 Mailed
   - Returned Questionnaires: n = 288 Pharmacies (36.8%)
     - 161 Chain Stores
     - 121 Independents
     - 6 “Other”
   - Total Questionnaires Received: n = 653 (27.8%)

### Appendix C

**The Number and Percentage of Respondents Who Were Aware or Unaware that the Law Requires a 72-Hour Emergency Prescription to Be Dispensed, Controlling for Practice Setting and Pharmacy Position**

<table>
<thead>
<tr>
<th>Pharmacy Position “Awareness” Response</th>
<th>Practice Setting</th>
<th>All Respondents N (%)</th>
<th>Independent n (%)</th>
<th>Chain n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacist-in-charge/owners Yes</td>
<td>199 (79.6)</td>
<td>91 (85.0)</td>
<td>108 (75.5)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>51 (20.4)</td>
<td>16 (15.0)</td>
<td>35 (24.5)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>250 (100.0)</td>
<td>107 (100.0)</td>
<td>143 (100.0)</td>
<td></td>
</tr>
<tr>
<td>Staff pharmacists Yes</td>
<td>117 (74.1)</td>
<td>7 (12.1)</td>
<td>66 (60.0)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>41 (25.9)</td>
<td>7 (12.1)</td>
<td>34 (34.0)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>158 (100.0)</td>
<td>24 (100.0)</td>
<td>100 (100.0)</td>
<td></td>
</tr>
<tr>
<td>Technicians Yes</td>
<td>169 (81.3)</td>
<td>85 (85.9)</td>
<td>84 (77.1)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>39 (18.8)</td>
<td>14 (14.1)</td>
<td>25 (22.9)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>208 (100.0)</td>
<td>99 (100.0)</td>
<td>109 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

*There was no statistically significant difference in the proportion of respondents who are aware of the 72-hour emergency prescription for pharmacists-in-charge ($\chi^2 = 3.418, P = 0.065$).

### Appendix D

**The Number and Percentage of Respondents Who Were Aware or Unaware that the Law Requires a 72-Hour Emergency Prescription to Be Dispensed, by Length of Time in Pharmacy Practice**

<table>
<thead>
<tr>
<th>Length of Time in Pharmacy Practice (Years)</th>
<th>Number and Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Respondents</td>
</tr>
<tr>
<td>0-5</td>
<td>139 (100.0)</td>
</tr>
<tr>
<td>6-10</td>
<td>127 (100.0)</td>
</tr>
<tr>
<td>11-15</td>
<td>94 (100.0)</td>
</tr>
<tr>
<td>16-29</td>
<td>137 (100.0)</td>
</tr>
<tr>
<td>30 or more</td>
<td>128 (100.0)</td>
</tr>
<tr>
<td>All employees</td>
<td>625 (100.0)</td>
</tr>
</tbody>
</table>

*28 respondents did not provide the length of time they have been in pharmacy practice or answer this question.

*There was no statistically significant difference among the respondents in how many were aware of the law requiring a 72-hour emergency prescription ($\chi^2 = 1.567, P = 0.815$).

---

*aThere was no statistically significant difference in the proportion of respondents who are aware of the 72-hour emergency prescription for pharmacists-in-charge ($\chi^2 = 3.418, P = 0.065$).

*bThere was a statistically significant difference in the proportion of respondents who are aware of the law requiring a 72-hour emergency prescription for staff level pharmacists ($\chi^2 = 9.188, P = 0.002$).

*cThere was no statistically significant difference in the proportion of respondents who are aware of the 72-hour emergency prescription for pharmacists-in-charge ($\chi^2 = 2.634, P = 0.105$).
### APPENDIX E

**Frequencies of the Categorized Responses of Comments and Product Examples from Respondents Who Indicated “Yes” to the Type of Product that Influences Their Decision on Whether or Not to Dispense a 72-Hour Emergency Prescription, Controlling for Pharmacy Position**

<table>
<thead>
<tr>
<th>Category</th>
<th>All Respondents N (%)</th>
<th>Pharmacist-in-Charge n (%)</th>
<th>Staff Pharmacists n (%)</th>
<th>Pharmacy Technician n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlled substances</td>
<td>92 (21.6)</td>
<td>38 (22.6)</td>
<td>21 (18.8)</td>
<td>33 (22.8)</td>
</tr>
<tr>
<td>Antibiotic/anti-infective</td>
<td>46 (10.8)</td>
<td>17 (10.1)</td>
<td>10 (8.9)</td>
<td>19 (13.1)</td>
</tr>
<tr>
<td>Packaging presents difficulty</td>
<td>45 (10.6)</td>
<td>21 (12.5)</td>
<td>11 (9.8)</td>
<td>13 (9.0)</td>
</tr>
<tr>
<td>Inhalers</td>
<td>38 (8.9)</td>
<td>18 (10.7)</td>
<td>8 (7.1)</td>
<td>12 (8.35)</td>
</tr>
<tr>
<td>Expensive/high price</td>
<td>30 (7.1)</td>
<td>11 (6.5)</td>
<td>10 (8.9)</td>
<td>9 (6.2)</td>
</tr>
<tr>
<td>Cough/cold agents</td>
<td>28 (6.3)</td>
<td>9 (5.4)</td>
<td>7 (6.3)</td>
<td>12 (8.3)</td>
</tr>
<tr>
<td>Nausea/vomiting/Zofran</td>
<td>22 (5.2)</td>
<td>9 (5.4)</td>
<td>8 (7.1)</td>
<td>5 (3.4)</td>
</tr>
<tr>
<td>Diabetes/insulin</td>
<td>10 (2.4)</td>
<td>5 (3.0)</td>
<td>3 (2.7)</td>
<td>2 (1.4)</td>
</tr>
<tr>
<td>Eye or ear drops</td>
<td>10 (2.4)</td>
<td>3 (1.8)</td>
<td>3 (2.7)</td>
<td>4 (2.8)</td>
</tr>
<tr>
<td>Antiseizure products</td>
<td>6 (1.4)</td>
<td>2 (1.2)</td>
<td>2 (1.8)</td>
<td>2 (1.4)</td>
</tr>
<tr>
<td>Blood pressure products</td>
<td>6 (1.4)</td>
<td>3 (1.8)</td>
<td>2 (1.8)</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Pain</td>
<td>4 (0.9)</td>
<td>3 (1.8)</td>
<td>0 (0.0)</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Emergency use</td>
<td>2 (0.5)</td>
<td>0 (0.0)</td>
<td>1 (0.9)</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Heart/cardiac</td>
<td>2 (0.5)</td>
<td>1 (0.6)</td>
<td>0 (0.0)</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Other</td>
<td>84 (19.8)</td>
<td>28 (16.1)</td>
<td>26 (23.2)</td>
<td>30 (20.7)</td>
</tr>
<tr>
<td>Total</td>
<td>425 (100.0)</td>
<td>168 (100.0)</td>
<td>112 (100.0)</td>
<td>145 (100.0)</td>
</tr>
</tbody>
</table>

*75 respondents did not answer this question with a numerical value.

### APPENDIX F

**The Mean Number of Times that Drug Products Dispensed in the Last Month for 72-Hour Emergency Prescriptions Were Changed after Obtaining Prior Authorization, by Pharmacy Type and Position Level**

<table>
<thead>
<tr>
<th>Category</th>
<th>Men (SD) n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy type</td>
<td></td>
</tr>
<tr>
<td>Independent pharmacies</td>
<td>3.17 (5.92) 247</td>
</tr>
<tr>
<td>Chain store pharmacies</td>
<td>2.99 (7.63) 319</td>
</tr>
<tr>
<td>Totalb</td>
<td>3.04 (6.87) 566</td>
</tr>
<tr>
<td>Position</td>
<td></td>
</tr>
<tr>
<td>Pharmacists-in-charge</td>
<td>3.55 (8.94) 234</td>
</tr>
<tr>
<td>Staff pharmacists</td>
<td>3.20 (6.37) 146</td>
</tr>
<tr>
<td>Technicians</td>
<td>2.31 (3.59) 198</td>
</tr>
<tr>
<td>Totalc</td>
<td>3.04 (6.87) 578</td>
</tr>
</tbody>
</table>

*There was no statistically significant difference among the different store types in how often the drug product was changed after obtaining prior authorization (F = 0.384; P = 0.681).

*There was no statistically significant difference among the different positions in how often the drug product was changed after obtaining prior authorization (F = 1.802; P = 0.166).*

75 respondents did not answer this question with a numerical value.
Examination of Why Some Community Pharmacists Do Not Provide 72-Hour Emergency Prescription Drugs to Medicaid Patients When Prior Authorization Is Not Available

A Sampling of Other Reasons/Factors for Not Dispensing 72-Hour Emergency Prescriptions

- They are for high-cost meds that have other alternatives to them.
- Some physicians will not do PA, especially ER doctors.
- Laziness. Extra work because Rx has to be entered again for PA to remain in system and be faxed to doctor.
- We have no way to submit a 72-hour supply for reimbursement.
- MDs usually take longer than 72 hours to do PA, so why have patient start med when more than likely it won’t be completed in 72 hours.
- Educational material is necessary in order to promote the use of emergency supplies by all personnel especially RPhs (many are not aware of the codes).
- It’s hard to dispense 72 hours of antibiotics that have to be mixed because they are stock size. Ointment cream because of size. Eye drops, inhalers, insulin. These drugs are different, but we would and do see that patient is taken care of.
- Drug reps often detail physicians’ Texas PA drugs, and the physicians think those detailed drugs are covered.
- Drug reps are often confused or are misinformed about what drugs are covered.
- Oversight. Working too fast and not realizing it is a PA for Medicaid, and we could and should use the override.
- Medicine is prescribed by doctors who “don’t do prior auths.” Prime example is local emergency room docs.
- Prior authorization codes do not work and Medicaid is not available. This is the #1 problem.
- Very few prescribers classify as an “emergency.”
- Pharmacy employees do not know when use of the 72-hour emergency supply is appropriate.
- Fear of being audited for a 3-day supply, and prescriber did not complete PA.
- Chargeback and ER doctors do not do PA. TXMED formulary may change, but website not updated.
- We are not assured of getting paid. Many of our prescriptions are from ER doctors, and those doctors simply will NOT do a prior authorization.
- A 72-hour dose is not enough over a weekend. If it occurs on Friday, then the patient is out by Sunday, the doctor is closed all weekend, and they are not working on it.
- Most prescriptions are from hospitals that do not do prior authorization so therefore the prescription must be changed.
- Stock bottles or medication that cannot be broken to a 3-day supply, i.e., an inhaler that would normally last 30 days. Pharmacist is afraid we won’t get reimbursed for the full price of the medication.
- We have seen a rise in prior auth. scripts. During business hours, we contact the doctor to submit the prior auth. The patient leaves the pharmacy hoping the prior auth. will be done. Some doctors are taking several days to take care of the issue even though some medications are written by ER physicians or are only for 72-hour supplies to begin with.
- The dosage is higher than the usual dose for the age and weight of the patient. Medicine is contraindicated.
- Time and costs involved plus keeping track of dispensed Rx’s.
- 99 percent of physicians do not call for prior authorization . . . an exorbitant number of prior authorizations are sent back to physician.
- Doctors and their nurses frequently refuse to complete prior auths. and change the drug before the patient comes in to pick up their filled Rx.
- CII Rx.
- The medication rejection does not tell you that either an emergency override is possible or give you the steps needed to complete in the rejection. If the knowledge of the process is not already known, then this can cause nonprocessing.
- Doctors do not know how the 72-hour supply works/is available. Medicaid has brand name on formulary when generic would be much more easy to use.
- If prior auth. takes longer than 72 hours, the patient expects the whole prescription whether approved or not. Uneven number of pills left on Rx; example: Rx for #30 of X, we give #3, there are 27 + 2 refills left. At next fill, do we only fill 27? No, we fill 30 and Rx is left short at the end, which confuses/annoys patients.
Pharmacy Students Teaching Prescribers Strategies to Lower Prescription Drug Costs for Underserved Patients

Marilyn R. Stebbins, PharmD; Meghan E. Frear, PharmD; Timothy W. Cutler, PharmD; James M. Lightwood, PhD; Amanda R. Fingado, MPH; Cindy J. Lai, MD; and Helene Levens Lipton, PhD

ABSTRACT

BACKGROUND: The rising costs of health care and, in particular, prescription drugs remains a challenge. Health professionals’ ability to promote cost-effective prescription drug use is critical, yet this subject is not included consistently in the curriculum of most health professional schools. As experts in prescription drug selection, use, and cost, pharmacists are in a unique position to help manage prescription drug regimens for the best therapeutic outcome, while also helping to keep patients’ out-of-pocket (OOP) prescription drug costs low. In addition to promoting interprofessional collaboration, pharmacy student-led lectures may provide an effective means to teach prescription drug cost-savings strategies to other health professional students and current prescribers.

OBJECTIVE: To describe and evaluate the impact of a 60- to 90-minute standardized, case-based lecture on prescribers’ attitudes and knowledge about drug cost-containment strategies.

METHODS: Four trained pharmacy students delivered a lecture that focused on strategies to help underserved patients with their OOP prescription drug costs. This lecture was given to health professional students and prescribers across disciplines. For purposes of this study, underserved patients included those with no drug insurance, those with limited financial resources who were unable to pay for their prescription drugs, and those whose drug insurance had significant gaps in coverage (e.g., Medicare Part D patients). Lectures targeted future and current prescribers and were delivered in multiple settings (e.g., residents’ seminars, medical grand rounds, required health policy courses for medical and nursing students). Pretest/posttest surveys were administered to assess the impact of the lecture on learners’ (a) knowledge of strategies to improve underserved patients’ access to needed prescription drugs; (b) willingness to address and discuss cost issues with patients; (c) likelihood of collaborating with other health care professionals; and (d) perception of pharmacists as patient advocates. The survey collected demographic information about learners and assessed their knowledge through 5 case-based, multiple-choice questions. The survey also asked learners to rate their agreement with 5 statements using a 4-point Likert rating scale (4 = strongly agree to 1 = strongly disagree). To control for potential test-retest bias for the case-based knowledge questions, an alternate version of the pretest/posttest survey was developed without the pretest knowledge questions included. Learners received either 1 of the 2 surveys randomly before the lecture began and were instructed to complete the pretest portion of the survey before the start of the lecture and to complete the posttest portion of the survey at the conclusion of the lecture.

RESULTS: From October 2010 to June 2012, trained pharmacy students delivered 19 presentations to 626 learners from other health professions. Compared with the baseline, there was a statistically significant increase in the proportion of correct answers for each knowledge-based question after delivery of the lecture (overall significance P<0.001). Furthermore, there was a significant increase in the proportion of learners responding that they were more confident in their ability to select prescription drug cost-saving strategies; more likely to consult with other providers to lower OOP prescription drug costs; more likely to consider costs when making prescribing decisions; and more likely to ask their patients about prescription drug affordability (overall significance of P<0.05). In addition, after the lecture, more learners felt that pharmacists were patient advocates. Finally, 96% of learners felt that the lecture promoted interprofessional collaboration and would recommend it to other health care professionals.

CONCLUSIONS: This study demonstrates that a single lecture given by pharmacy students to other health care professional students and current prescribers can improve knowledge of prescription drug cost-saving strategies targeted toward vulnerable patient populations and may increase the likelihood of collaboration between prescribers and pharmacists. The format of this lecture is an efficient and effective way to disseminate important and timely policy information to health care professionals.

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What is already known about this subject

- Cost-related nonadherence to prescription drug therapy remains an important public health challenge, particularly for underserved patients. The ability to keep patients’ out-of-pocket (OOP) prescription drug costs low is important for enhancing patients’ adherence to a drug regimen, improving clinical outcomes, and reducing patients’ use of expensive emergency and inpatient care services. However, the skills needed for prescribers to lower patients’ prescription drug costs are not routinely taught or addressed in the health professional curriculum.

- Two previous studies showed that pharmacy student-led lectures on Medicare Part D significantly increased (a) self-assessed knowledge of Medicare Part D; (b) intent of current and future prescribers to collaborate with pharmacists to reduce patients’ OOP prescription drug costs; and (c) awareness of cost-saving strategies to reduce patients’ OOP drug costs. Limitations of these studies include the narrow focus of the lecture (Part D only content) and reliance on self-assessment of knowledge rather than objective measures.

What this study adds

- A single, structured lecture designed to address medication cost issues for underserved populations of all ages that is delivered by trained pharmacy students can significantly improve learners’ (a) knowledge of strategies to lower OOP prescription drug costs for underserved patients; (b) confidence in their ability to lower patients’ OOP prescription drug costs; (c) likelihood to consider drug costs when making prescribing decisions; (d) likelihood of asking patients about cost as a potential barrier to adhering to drug regimens; and (e) likelihood of collaborating with pharmacists, social workers, or case managers to lower patients’ OOP prescription drug costs.
The rising cost of health care, including patient out-of-pocket (OOP) prescription drug costs, continues to be a challenge, especially for the uninsured, underinsured, and/or low-income patients.1,2 Despite efforts to improve access to needed prescription drugs, cost-related nonadherence to prescription drug therapy remains an important public health problem, as it may result in poor clinical outcomes and increased costs.2-4 Physicians and other prescribers may not be aware of high drug costs for specific patients, have time to address those costs in patient visits, or have an efficient manner in which to address high drug costs for their patients. Physicians may not be familiar with, or have easy access to, an individual patient’s formulary and extent of OOP drug costs.5 Results from a recent study reveal that medical fellows, attending physicians, physician assistants, and nurse practitioners identified the cost of prescription drugs correctly less than half of the time.5 Even if the provider is aware of the prescription costs, the skill of helping patients manage OOP prescription drug costs is not consistently taught in health professional educational programs and is not routinely addressed during patient encounters.5,7-13

While a more informed, cost-conscious health care workforce is one step toward improvement in patient adherence with prescription drug therapy, recent health policy legislation is changing the way the health care workforce engages patients. Medical institutions have attempted to keep pace so that future health care providers are prepared and can effectively adapt to the evolving changes in health policy.16 The Affordable Care Act, passed in 2010, includes many of these new policies, including the patient-centered medical home, medication therapy management services, and transitions in care, all of which employ the use of multidisciplinary teams to deliver care to patients.17

Interprofessional teams use the expertise of each team member to achieve the best health outcomes for their patients. As experts in prescription drug selection, use, and cost, pharmacists are in a unique position to help manage patients’ prescription drug therapy to achieve maximal therapeutic benefit while keeping patients’ OOP prescription drug costs low.11 Prior research has shown that Medicare Part D lectures delivered by trained pharmacy students led to a statistically significant improvement in learners’ self-assessed Medicare Part D knowledge, perceptions of pharmacists’ contributions to the health care team, and intent to collaborate with pharmacists on specific patient activities.18,19 These data were limited, however, to self-assessed knowledge acquisition related to Medicare Part D.

The purpose of this study was to describe and systematically evaluate the impact of a lecture on improving prescribers’ knowledge about OOP medication cost reduction strategies. The lecture focused on strategies to help underserved patients with their OOP prescription drug costs and was delivered by pharmacy students to health professional students and prescribers across disciplines. For purposes of this study, underserved patients included those with no drug insurance, those with limited financial resources who were unable to pay for their prescription drugs, as well as those whose drug insurance had significant gaps in coverage (e.g., Medicare Part D patients).

Methods

Design

This study used a pretest/posttest survey design to measure the impact of the lecture on learners’ (a) knowledge of cost-saving strategies to lower OOP drug costs for underserved patients; (b) confidence in their ability to lower patients’ OOP drug costs; (c) likelihood to consider costs when making prescribing decisions; (d) likelihood of asking patients whether they are experiencing problems with the costs of their medications; and (e) likelihood of collaborating with pharmacists, social workers, or case managers to lower patients’ OOP prescription drug costs.

This study used an incomplete Solomon four-group design: one group received the pretest, intervention, and posttest, while the other group received the intervention and posttest. As all learners attended the lecture (intervention), the pretest sensitization effect could be measured. Since the surveys were given immediately before and after the intervention, the potential for a temporal effect was not examined. This design did not determine a general testing effect bias. This simplified design was used to ensure that the lecture content was disseminated to as many learners as possible in a short time frame.

Setting, Intervention, and Participants

Based on the success of 2 previous studies using student pharmacists to teach other health professionals, a similar methodology was applied to this study. Additionally, students, rather than existing faculty, were chosen as the lecturers to increase concordance with audiences of other health care professional students and to allow greater flexibility in scheduling lectures. Four pharmacy students from a California pharmacy school were selected in both 2010 and 2011 through a competitive application process and were subsequently trained to deliver a standardized, case-based lecture to interprofessional audiences. Faculty from the schools of pharmacy and medicine at the University of California San Francisco (UCSF) educated...
the pharmacy students in prescription drug cost-containment strategies for uninsured, underinsured, low-income, and Medicare Part D patients. These faculty members also provided public speaking coaching for each of the presenters.

The lecture content focused on content domains that could help clinicians use drug cost-savings strategies to lower their underserved patients’ OOP prescription drug costs. The presentation was divided into 4 sections, 1 for each student lecturer. Content for each lecture is described in Figure 1. The lecturers discussed specific facts about the types of patients who may need help affording their OOP prescription drug costs, the programs available to help each of these populations, the benefits and limitations of these programs, and the types of outcomes that may be avoided by helping patients afford their medications. The lecturers focused on practical take-away messages that could be immediately implemented by prescribers. Students also emphasized the benefit of collaborating with pharmacists given their expertise with OOP prescription drug costs and experience in helping underinsured patients access available programs. Lecturers highlighted ways for prescribers to collaborate with pharmacists to implement drug cost-containment strategies for patients.

The target audiences for these lectures were current and future prescribers, including medical students, resident physicians, nurse practitioner students, and medical faculty. Lectures were scheduled as part of required and voluntary events and were delivered in a variety of settings, including medical grand rounds at major academic medical centers in California and across the country, national research meetings, required health policy courses and seminars for physician residents in internal medicine and family medicine, and clinic-based interdisciplinary team conferences. The lecture was designed to be 60 minutes in length. When time permitted, audience questions were discussed for up to 90 total minutes.

Survey
Pretest/posttest surveys were administered to assess the impact of the lecture on learners’ (a) knowledge of strategies to improve underserved patients’ access to needed prescription drugs; (b) willingness to address and discuss cost issues with patients; (c) likelihood of collaborating with other health care professionals; and (d) perception of pharmacists as patient advocates. The pretest survey collected demographic information about learners and assessed their knowledge through 5 case-based multiple-choice questions. Four of these questions asked learners to select the correct prescription drug cost-saving strategy for a given patient. The 4 prescription drug cost-saving strategies in each question were (1) applying for the low-income subsidy (LIS) for Medicare patients; (2) avoiding the Medicare Part D coverage gap; (3) applying for patient-assistance programs sponsored by pharmaceutical manufacturers; and (4) applying for copayment-assistance programs. The fifth question assessed learners’ knowledge of the percentage of U.S. households without health insurance, in which 1 or more adults were employed.

The pretest survey also asked learners to rate their agreement with the following 5 behavioral statements using a 4-point Likert rating scale (4 = strongly agree to 1 = strongly disagree). A 4-point Likert rating scale was selected to encourage participants to offer an opinion rather than select a “neutral” category. The behavioral statements used were as follows:

- I think of pharmacists as patient advocates.
- I have confidence in my ability to help my low-income patients lower their medication costs.
- I consult with pharmacists, social workers, and/or case managers about prescription drug cost-saving strategies for patients.
- I consider medication costs when making prescribing decisions.
- I ask my patients if they are having problems with their medication costs.
To control for a potential pretest sensitization effect for the case-based knowledge questions, an alternate version of the survey was developed without the pretest knowledge questions included (learners who received this version were considered the control group). The 2 versions of the survey were distributed to learners at random before the lecture began, and learners were instructed to complete the pretest portion of the survey before the start of the lecture and to complete the posttest portion of the survey at the conclusion of the lecture (Appendices A and B, available in online article).

The same postlecture survey was given to all learners. The posttest survey asked participants to rate their agreement with the same 5 behavioral variables as the pretest survey, using the same 4-point Likert scale. Additional Likert-scale questions were included in the postlecture survey to assess learners’ opinions of the lecture’s quality; the effectiveness of pharmacy student lecturers; the utility of the information provided; the ability of this lecture format to promote interprofessional collaboration; and their willingness to recommend the lecture to other health professionals. All learners were asked 5 multiple-choice knowledge questions to assess their actual understanding of specific drug cost-containment strategies and information provided in the lecture. These cases assessed understanding of the same drug cost-saving strategies used in the pretest but used slightly different patient vignettes. The final 2 questions were open-ended and invited participants to share their views regarding what they liked about the lecture, as well as their suggestions for improvement.

The pretest and posttest surveys were tested for face, content, and external validity by 2 different groups of medical residents prior to the start of the study. All learners were told that survey completion was voluntary.

### Statistical Analysis

Learners’ demographic characteristics were summarized with descriptive statistics and assessed for independence using chi-squared tests. Differences in response to behavioral variables, as defined above, and to knowledge questions were assessed using t-tests between proportions with stepwise Sidak adjustment to correct for multiple comparisons using an overall 5% significance level for all comparisons required for each research question. For knowledge questions, control group posttest surveys were compared with experimental group pretest surveys to test knowledge acquisition due to the lecture without confounding from test-retest bias. Results to questions regarding quality, utility, and effectiveness of the lecture and learners’ willingness to recommend the lecture to other health care providers were summarized with descriptive statistics. Data and statistical analysis were completed using Microsoft Excel (2011; Microsoft Corp., Redmond, WA).

### Results

Between October 2010 and June 2012, pharmacy students from a California school of pharmacy gave 19 presentations to 626 learners. Audiences ranged in size from 7 to 98 participants. As shown in Figure 2, a total of 626 learners attended a lecture and completed a survey. As the target audience was current and future prescribers, 407 learners not meeting these criteria were excluded from the analysis, leaving 219 learners. Regardless of discipline, all current or future prescribers who attended the entire lecture and completed the pretest/posttest survey were included in the analysis. Based on the random distribution of the pretest survey, learners were randomly assigned to be in the experimental group (n = 108) or control group (n = 111). The majority of learners were female (61%). Overall, learners were largely affiliated with medicine (87%) and were medical residents (50%). Learners’ ages ranged from aged 22 to 73 years, with a mean age of 35 [21]. There were no significant differences in demographic characteristics of learners receiving the test or control survey (χ², P > 0.05), including health professional school affiliation, level of training, gender, and age.

The primary objective of this lecture was to improve learners’ knowledge of specific prescription drug cost-saving strategies. Analysis showed that there was no test-retest bias, meaning there was no statistical difference in the proportion of correct answers for case-based questions after the lecture between the control and experimental groups. This allowed
both groups of postlecture surveys to be combined. A statistically significantly higher proportion of learners gave the correct answer on the knowledge-based questions after the lecture (overall $P<0.001$, Table 1). The greatest change in proportion of correct answers was observed in the question addressing the recognition of strategies to avoid the coverage gap in the Medicare Part D population and use of copayment-assistance programs for underinsured patients (56% increase), followed by the recognition of enrollment in a low-income subsidy for Medicare Part D patients that meet financial criteria (52% increase). The proportion of correct answers for the question assessing the use of patient-assistance programs for uninsured patients increased 39% from baseline, and learners’ ability to correctly recognize the percentage of uninsured Americans who have at least 1 employed family member increased 29% from baseline.

The lecture changed learner’s perception of their behaviors and attitudes (Figure 3). There was a significant increase ($P<0.05$) after the lecture in the proportion of learners who “agreed” or “strongly agreed” that they consult with other health care providers about prescription drug cost-saving strategies (27% increase); ask their patients about drug cost problems (30% increase); consider costs when making prescribing decisions (13% increase); and are confident in their ability to help patients lower their prescription drug costs (52% increase; $P<0.05$ for all 4 preceding tests). While the percentage of learners who felt pharmacists were patient advocates increased by 4%, this result did not reach statistical significance.

When asked about the quality and utility of the information and effectiveness of this lecture style, learners responded positively: 90% of learners felt the quality of the lecture was “good” or “very good;” 91% of learners felt that the lecture was “very” or “extremely” useful; 96% of learners “somewhat” or “strongly” agreed that the lecture format was effective in promoting interprofessional collaboration. Ninety-six percent of learners stated that they “somewhat” or “strongly” agreed that they would recommend this style of lecture to other health care professionals.

Finally, learners were asked to provide additional comments about what they liked best about the lecture, and more than half (n = 109, 54%) provided written feedback. The authors identified thematic categories based on learners’ responses, and 3 major themes emerged regarding what the learners liked best about the lecture: (1) the clarity and/or organization of the content presented (n = 82, or 75% of learners who provided written feedback to this question); (2) the practical, clinically relevant strategies provided (n = 36, 33%); and (3) the use of case-based examples to illustrate key points (n = 18, 17%). Forty-six learners (23%) also provided written feedback to the open-ended question that asked “How can this lecture be improved?” A review of these comments found that the majority of those learners providing suggestions for improvement wanted the lecture expanded, either through the addition of more content (n = 21, or 46% of learners who provided written feedback to this question) or dissemination of the presentation to additional audiences (n = 8, 17%).

### Discussion

This study builds on preliminary research supporting the use of student pharmacists to teach the application of important health policy to current and future prescribers. However, these studies relied on self-assessment of knowledge and focused only on Medicare Part D. This new lecture provided broader information on drug cost-containment strategies for underserved patients of all ages, focusing on practical strategies prescribers can use to promote underserved patients’ access to needed medications. This study adds to the literature by demonstrating 3 important findings. First, a single structured lecture given by trained pharmacy students, on a topic other than Medicare Part D, may increase the likelihood that prescribers feel confident in their ability to help their underserved patients lower their OOP prescription drug costs. In addition, prescribers reported being more likely to ask their patients if they are having trouble paying for their prescription drugs and to consider costs when making prescribing decisions, which may have implications on patient adherence to medications. Second, prescribers may be more likely to collaborate with pharmacists, case managers, or social workers to help patients afford their prescription drugs when collaboration is encouraged throughout a single lecture. Finally, this study demonstrated that pharmacy student-led lectures delivered to health professionals can significantly and objectively improve knowledge of a variety of drug cost-containment strategies targeted to underserved populations.
The current study is methodologically stronger than prior studies in which knowledge acquisition was measured via learners’ self-report. In this study, case-based questions were used to assess the extent to which learners improved their knowledge of specific drug cost-saving programs and strategies. Using objective measures to assess knowledge acquisition reduces responder bias and provides a more accurate and valid assessment of actual knowledge acquired from the lecture. Further, to reduce test-retest bias, an alternative version of the pretest survey was distributed in which specific knowledge questions were omitted.

The increasing cost of health care and prescription drug cost-related nonadherence continue to be issues of national importance. Employing prescription drug cost-saving strategies are an important mechanism to help patients reduce their OOP drug cost burden. Though physicians may consider drug costs when determining effective therapy, they face the barriers of insufficient time, discomfort with the topic, lack of available cost information, and insufficient knowledge of solutions when considering addressing cost with their patients. In addition, physicians who address cost may use strategies that are not ideal for every patient, such as providing office samples, tablet splitting, and discontinuation of nonessential prescription drugs. If health care professionals had heightened awareness that the cost of a patient’s prescription drugs was leading to nonadherence, they could employ cost-saving strategies to improve adherence. One way to make health professionals more aware of cost-related barriers affecting patients’ use of health services is to introduce cost-consciousness into the health professional curriculum and postgraduate education. Our lecture was designed to address this issue, providing information on drug cost-containment programs targeted toward uninsured and underinsured patients (e.g., patient-assistance programs, copayment-assistance programs, statewide programs for patients denied coverage for pre-existing conditions, generic drug programs, etc.). In addition, we chose pharmacy students, rather than faculty, as the lecturers to increase concordance with audiences that were mainly composed of health professional educators and current practitioners.

The increase in patient-centered collaborative practice models, such as patient-centered medical homes, are designed to improve access and coordination of health care services for patients, while decreasing costs by reducing length of hospital stay, clinical errors, and patient complications. With the advent of team-based care initiatives, health professional educators and current practitioners have found an
increasing need to promote interprofessional collaboration through innovative teaching models.\textsuperscript{18,22,23} These patient care models require that health care professionals work together effectively. However, evidence suggests that they do not always collaborate well together.\textsuperscript{24} Transforming the education process to mirror current practice reform efforts can be the key to preparing leaders in affordable and sustainable health care delivery models. While some changes in health policy education have occurred, more instruction should still be considered.\textsuperscript{25,26} The findings from this study showed an increased intent by prescribers to collaborate with pharmacists after a single lecture. Other new lectures given by providers outside of pharmacy may also increase the likelihood of collaboration among health care professionals. An example may be a lecture given by a nurse case manager regarding discharging patients with appropriate oversight of care transitions, which may increase confidence in the ability of the providers to coordinate transitions in care and increase their likelihood of collaborating with nurse case managers for difficult patient cases.

The potential for improved collaboration through efficient professional-to-professional lectures is important in order to reach the health care goals expected from health care reform. If health care teams are able to help patients afford their prescription drugs and adhere to therapy, the full benefit of improved health outcomes may be realized.\textsuperscript{3,4}

Limitations

There are 2 important limitations to this study. First, long-term follow-up data were not collected; as a result, it is unknown whether learners retained changes in knowledge and attitudes over time; if any prescription drug cost-saving strategies were used on behalf of patients; and whether the application of such strategies reduced patients’ OOP drug costs. However, this lecture did show significant improvements in knowledge and attitude immediately following the lecture. Second, while our study design controlled for test-retest bias, there is no true control group; therefore, the effectiveness of this student-led presentation could not be compared with more typical, faculty-led lectures. In this case, the widespread dissemination of the information took precedence, allowing this information to be shared with as many learners as possible.

Conclusions

Cost-related nonadherence to prescription drug therapy remains an important public health challenge. This issue is compounded by the problem that even if providers are aware of the prescription costs their patients face, the strategies used to help patients manage OOP prescription drug costs are not consistently taught in health professional educational programs. In addition, the issue of cost-related nonadherence is not routinely addressed during patient encounters.\textsuperscript{4,7-15} This study demonstrated that a single lecture given by pharmacy students to other health care professional students and current prescribers can improve knowledge of prescription drug cost-containment strategies targeting vulnerable patient populations and can increase the likelihood of collaboration between prescribers and pharmacists. While future studies should determine if this intervention changes clinical practice and reduces patients’ actual OOP prescription drug costs, these results show that this lecture format is an efficient way to disseminate important and timely information to health care professionals as they begin to practice in the new health care delivery models outlined in health care reform.

Authors

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DISCLOSURES

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Study concept and design were contributed by Stebbins, Lipton, Lai, and Cutler. Data were collected by Fingado and Frear and interpreted by Stebbins, Fingado, and Lightwood. The manuscript was written by Stebbins, Lipton, Frear, and Cutler and revised by Stebbins, Lai, Fingado, and Frear.

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REFERENCES


Pharmacy Students Teaching Prescribers Strategies to Lower Prescription Drug Costs for Underserved Patients

APPENDIX A  Test Survey

1. In which school/program do you belong?
   - Medicine
   - Physician Assistant
   - Nursing
   - Dentistry
   - Pharmacy
   - Osteopathic Medicine
   - None
   - Other (specify):

2. What best describes your affiliation with the school/program? (Bubble in all that apply)
   - 1st year Student
   - 2nd year Student
   - 3rd year Student
   - 4th year Student
   - 5th year Student or Higher
   - Nurse Practitioner Student
   - Masters Student
   - PhD Student
   - Intern
   - Resident
   - Faculty (with prescribing authority)
   - Faculty (without prescribing authority)
   - Other (specify): _____________________________

3. What is your age? _____________ years

4. What is your gender?
   - Female
   - Male

Please fill in the correct bubble indicating how much you agree or disagree with the statements:

5. I think of pharmacists as patient advocates
   - Strongly Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

6. I have confidence in my ability to help my low-income patients lower their drug costs
   - Strongly Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

7. I consult with pharmacists, social workers and/or case managers about drug cost-saving strategies for patients.
   - Strongly Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

8. I consider drug costs when making prescribing decisions.
   - Strongly Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

9. I ask my patients whether they are having problems with their drug costs
   - Strongly Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

The next 5 questions will help us determine how much is known about the topics we are covering in the lecture today. In order for us to get the most accurate assessment, if you aren’t sure about the answer to a question please don’t guess – choose “I don’t know” instead. Thank you!

10. Approximately what percentage of uninsured individuals in the United States come from a working family (i.e., have at least one part-time worker in the household)?
   - a. 10%
   - b. 40%
   - c. 60%
   - d. 80%
   - e. I don’t know

11. Which patient might be able to lower his drug costs with the low-income subsidy?
   - a. 35 year old who is employed but underinsured
   - b. 50 year old who is homeless and uninsured
   - c. 50 year old who is employed but uninsured
   - d. 75 year old with Medicare Part D
   - e. I don’t know

12. A 62-year-old woman with diabetes has been laid off from work and is now uninsured and low-income (<200% of Federal Poverty Level). She is on a new medication, Januvia, which does not have a generic form. What is the best strategy to explore in order to lower her drug cost?
   - a. Patient-assistance programs
   - b. Copay-assistance programs
   - c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
   - d. Low-income subsidy through Social Security
   - e. I don’t know

13. A 60-year-old man is unable to afford his oral chemotherapy drug for cancer. He is employed, but is underinsured and has a very high copayment for this medication. What is the best strategy to explore in order to lower his drug cost?
   - a. Patient-assistance programs
   - b. Copay-assistance programs
   - c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
   - d. Low-income subsidy through Social Security
   - e. I don’t know

14. A patient with a Part D prescription drug plan may delay entering the coverage gap by:
   - a. Only taking medications on the Part D plan formulary
   - b. Applying for copay-assistance programs
   - c. Using $4 generic programs available at some retail pharmacies instead of Part D coverage
   - d. Having all medications prescribed in 90-day supplies
   - e. I don’t know
Please complete the next page of the questionnaire AFTER the presentation has concluded. Thank you!

**POSTPRESENTATION SURVEY**

1. What did you think of the overall quality of instruction in today’s lecture?
   - Poor  □  Fair  □  Good  □  Very Good  □  Excellent

2. How useful was the information you learned today?
   - Not at all  □  A little  □  Moderately  □  Very  □  Extremely

<table>
<thead>
<tr>
<th>Please fill in the correct bubble indicating how much you agree or disagree with the statements:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strongly Agree</strong></td>
</tr>
<tr>
<td>3. I think this type of peer-to-peer lecture, where students teach other health professionals, is an effective way to provide education.</td>
</tr>
<tr>
<td>4. I think this type of peer-to-peer lecture promotes collaboration among health professionals.</td>
</tr>
<tr>
<td>5. I would recommend this lecture to other health professionals.</td>
</tr>
</tbody>
</table>

**As a result of this lecture…**

6. I am more likely to think of pharmacists as patient advocates.  □  □  □  □

7. I have more confidence in my ability to help my low-income patients lower their drug costs.  □  □  □  □

8. I am more likely to consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients.  □  □  □  □

9. I am more likely to consider drug cost when making prescribing decisions.  □  □  □  □

10. I am more likely to ask my patients whether they are having problems with their drug costs.  □  □  □  □

Again, if you aren’t sure about the answer to a question please don’t guess – choose “I don’t know” instead. Thank you!

11. The low-income subsidy may help lower drug costs for which one of the following patients?
   - a. 28 year old who is employed but underinsured
   - b. 80 year old with Medicare Part A and B only
   - c. 80 year old with Medicare Part D
   - d. 40 year old who is homeless and uninsured
   - e. I don’t know

12. A patient with a Part D prescription drug plan is interested in learning about how to minimize the chance she will end up in the “donut hole.” What can you advise?
   - a. Switching to a Part D plan with lower prescription co-pays
   - b. Using $4 generic programs available at some retail pharmacies instead of Part D coverage
   - c. Having all medications prescribed in 90-day supplies
   - d. Applying for copay-assistance programs
   - e. I don’t know

13. Approximately what percentage of uninsured individuals in the United States come from families that include at least one part-time or full-time worker?
   - a. 10%
   - b. 40%
   - c. 60%
   - d. 80%
   - e. I don’t know

14. A 42-year-old man is uninsured and low-income (<200% of Federal Poverty Level). He has been on a brand-name medication, Cymbalta, which is the only drug that controls his neuropathic pain and depression. What is the best strategy to explore in order to lower his drug cost?
   - a. Patient-assistance programs
   - b. Copay-assistance programs
   - c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
   - d. Low-income subsidy through Social Security
   - e. I don’t know

15. Although she has health insurance, a 45-year-old woman is unable to afford the copayment for her oral cancer chemotherapy. What is the best strategy to explore in order to lower her drug cost?
   - a. Patient-assistance programs
   - b. Copay-assistance programs
   - c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
   - d. Low-income subsidy through Social Security
   - e. I don’t know

16. What did you like best about this lecture?

17. How can this lecture be improved?
APPENDIX B

Control Survey

1. In which school/program do you belong?
   ○ Medicine  ○ Physician Assistant  ○ None
   ○ Nursing   ○ Dentistry           ○ Other (specify):
   ○ Pharmacy  ○ Osteopathic Medicine

2. What best describes your affiliation with the school/program? (Bubble in all that apply)
   ○ 1st year Student  ○ Nurse Practitioner Student
   ○ 2nd year Student  ○ Masters Student
   ○ 3rd year Student  ○ PhD Student
   ○ 4th year Student  ○ Intern
   ○ 5th year Student or Higher  ○ Resident
   ○ Faculty (with prescribing authority)
   ○ Faculty (without prescribing authority)
   ○ Other (specify): __________________________

3. What is your age? _____________ years

4. What is your gender?
   ○ Female  ○ Male

Please fill in the correct bubble indicating how much you agree or disagree with the statements:

5. I think of pharmacists as patient advocates.  
   ○ Strongly Agree  ○ Somewhat Agree  ○ Somewhat Disagree  ○ Strongly Disagree

6. I have confidence in my ability to help my low-income patients lower their drug costs.  
   ○  ○  ○  ○

7. I consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients.  
   ○  ○  ○  ○

8. I consider drug costs when making prescribing decisions.  
   ○  ○  ○  ○

9. I ask my patients whether they are having problems with their drug costs.  
   ○  ○  ○  ○

10. Why are you interested in this lecture?

11. What do you hope to get out of today’s lecture?

Please complete the next page of the questionnaire AFTER the presentation has concluded.

Thank you!
POSTPRESENTATION SURVEY

1. What did you think of the overall quality of instruction in today’s lecture?
   - Poor
   - Fair
   - Good
   - Very Good
   - Excellent

2. How useful was the information you learned today?
   - Not at all
   - A little
   - Moderately
   - Very
   - Extremely

Please fill in the correct bubble indicating how much you agree or disagree with the statements:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Strongly Disagree</th>
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</table>

As a result of this lecture...

6. I am more likely to think of pharmacists as patient advocates.
7. I have more confidence in my ability to help my low-income patients lower their drug costs.
8. I am more likely to consult with pharmacists, social workers, and/or case managers about drug cost-saving strategies for patients.
9. I am more likely to consider drug cost when making prescribing decisions.
10. I am more likely to ask my patients whether they are having problems with their drug costs.

The next 5 questions will help us determine the clarity of our lecture. In order for us to get the most accurate assessment, if you aren’t sure about the answer to a question please don’t guess – choose “I don’t know” instead. Thank you

11. The low-income subsidy may help lower drug costs for which one of the following patients?
   - a. 28 year old who is employed but underinsured
   - b. 80 year old with Medicare Part A and B only
   - c. 80 year old with Medicare Part D
   - d. 40 year old who is homeless and uninsured
   - e. I don’t know

12. A patient with a Part D prescription drug plan is interested in learning about how to minimize the chance she will end up in the “donut hole.” What can you advise?
   - a. Switching to a Part D plan with lower prescription co-pays
   - b. Using $4 generic programs available at some retail pharmacies instead of Part D coverage
   - c. Having all medications prescribed in 90-day supplies
   - d. Applying for copay-assistance programs
   - e. I don’t know

13. Approximately what percentage of uninsured individuals in the United States come from families that include at least one part-time or full-time worker?
   - a. 10%
   - b. 40%
   - c. 60%
   - d. 80%
   - e. I don’t know

14. A 42-year-old man is uninsured and low-income (<200% of Federal Poverty Level). He has been on a brand-name medication, Cymbalta, which is the only drug that controls his neuropathic pain and depression. What is the best strategy to explore in order to lower his drug cost?
   - a. Patient-assistance programs
   - b. Copay-assistance programs
   - c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
   - d. Low-income subsidy through Social Security
   - e. I don’t know

15. Although she has health insurance, a 45-year-old woman is unable to afford the copayment for her oral cancer chemotherapy. What is the best strategy to explore in order to lower her drug cost?
   - a. Patient-assistance programs
   - b. Copay-assistance programs
   - c. Generic drug programs (e.g., Walmart, Target, Rxoutreach.org)
   - d. Low-income subsidy through Social Security
   - e. I don’t know

16. What did you like best about this lecture?

17. How can this lecture be improved?
Health Plan Utilization and Costs of Specialty Drugs Within 4 Chronic Conditions

Patrick P. Gleason, PharmD, BCPS, FCCP; G. Caleb Alexander, MD, MS; Catherine I. Starner, PharmD, BCPS; Stephen T. Ritter, BSPharm, RPh, MBA; Holly K. Van Houten, BS; Brent W. Gunderson, PharmD; and Nilay D. Shah, PhD

ABSTRACT

BACKGROUND: Drugs are most typically defined as specialty because they are expensive; however, other criteria used to define a drug as specialty include biologic drugs, the need to inject or infuse the drug, the requirement for special handling, or drug availability only via a limited distribution network. Specialty drugs play an increasingly important role in the treatment of chronic conditions such as multiple sclerosis (MS), rheumatoid arthritis (RA), psoriasis, and inflammatory bowel disease (IBD), yet little is known regarding the comprehensive medical and pharmacy benefit utilization and cost trends for these conditions.

OBJECTIVE: To describe MS, RA, psoriasis, and IBD trends for condition prevalence, treatment with specialty drugs, specialty costs, nonspecialty costs, and total direct costs of care within the medical and pharmacy benefits.

METHODS: This was a descriptive analysis of a commercially insured population made up of 1 million members, using integrated medical and pharmacy administrative claims data from 2008 to 2010. Analyses were limited to continuously enrolled commercially insured individuals less than 65 years of age. Condition-specific cohorts for MS, RA, psoriasis, and IBD were defined using standardized criteria. Trends in condition prevalence, specialty drug use for the conditions, and direct total cost of care were analyzed. The direct costs were subcategorized into the following: medical benefit specialty drug costs, medical benefit all other costs, pharmacy benefit specialty drug costs, and pharmacy benefit all other costs. Trends and compound annual growth rates were calculated for the total cost of care and subcategory costs from 2008 through 2010.

RESULTS: Condition prevalence ranged from a low of 1,720 per million members for MS to a high of 4,489 per million members for RA. Psoriasis and MS condition prevalence rates were unchanged over the 3 years; however, IBD prevalence increased 7.0%, and RA prevalence increased 9.7%. The rate of specialty drug use was lowest for IBD (13.7%) and highest for MS (71.8%). The lowest total annual cost of care was for psoriasis ($14,615), and the highest total annual cost was for MS ($36,901). The most commonly used specialty drugs for each of the conditions were as follows: glatiramer (MS), etanercept (RA and psoriasis), and infliximab (IBD). The total annual costs were more than double for the specialty drug users for psoriasis compared with all the psoriasis members ($29,565 vs. $14,815). The total costs were only somewhat higher among MS members using specialty drugs ($41,760 vs. $36,901). Among specialty drug users for each of the cohorts, the annual costs of specialty drugs accounted for 50% or more of the total annual costs. The annual spending growth rate for specialty drugs ranged from 4.4% to 18.0%.

CONCLUSIONS: Although specialty drug utilization varied widely across the 4 chronic conditions analyzed, when specialty drugs were used they accounted for the majority of the annual total direct cost of care. Because specialty drugs are accounting for a growing portion of chronic disease total cost of care, health insurers will need to become more vigilant regarding specialty drug use and focus on 4 cost saving management opportunities: drug distribution channel, utilization management, contracting activities, and care coordination.

What is already known about this subject

- In 2011, among U.S. privately insured individuals under aged 65 years, spending on specialty drugs accounted for 25% of the total spending for prescription drugs processed via the medical and pharmacy benefits and are forecasted to be 50% in 2018.
- Within the pharmacy benefit, specialty drugs account for 1% of all prescriptions but for 17% of the total spending. Specialty drug expenditures increased by 20.1% from 2010 to 2011.
- Specialty drugs play an increasingly important role in the treatment of such chronic conditions as multiple sclerosis (MS), rheumatoid arthritis (RA), psoriasis, and inflammatory bowel disease (IBD).
- Specialty drugs typically include biological products, are often administered as injections or infusions, sometimes require special handling and administration, and are substantially more expensive than the traditional small molecule drugs.

What this study adds

- As specialty drugs can be billed via both the medical and pharmacy benefits, integration of medical and pharmacy benefit claims data are required to obtain a comprehensive understanding of condition costs and specialty drug costs.
- In 2010, among persons treated with a specialty drug, the annual specialty drug costs were more than 50% of total direct cost of care.
  - MS specialty drug costs $28,152 (67.4%) of $41,760 per person per year (PPPY) total direct costs
  - RA specialty drug costs $18,098 (53.0%) of $34,163 PPPY total direct costs
  - IBD specialty drug costs $21,428 (50.3%) of $42,642 PPPY total direct costs
  - Psoriasis specialty drug costs $19,612 (66.3%) of $29,565 PPPY total direct costs
- The growth rate in expenditures for these conditions was 5.7% to 11.4%, which is much higher than the 4.3% national health consumption expenditure growth rate over the same time period.
- The specialty drug expenditure growth of 4.4% to 18.0% exceeded the national health consumption expenditure growth rate.
- These study findings, coupled with the forecast that specialty drugs will account for 50% of drug expenditures in the next 5 years, will necessitate health care payers to manage specialty drug costs and optimize value through drug management programs and policies. Specialty management programs and policies include drug distribution channels, utilization management, contracting activities, and care coordination.
The U.S. Food and Drug Administration (FDA) does not designate drugs as “specialty”; rather, the designation is internally defined within a health plan or pharmacy benefit manager (PBM) and, as such, can vary significantly. Although the definition of “specialty” will vary among health plans and PBMs, typically it is associated with a dollar amount cutoff and may include biologic drugs, drugs injected or infused, drugs requiring special handling, or drugs that are available only via a limited distribution network.\(^1\) In addition, specialty drugs may be defined by the condition they are used to treat; for example, human immunodeficiency virus or growth hormone deficiencies. Specialty drugs have provided new treatment options for many chronic conditions, although they have historically been used as treatments for cancer as well as rare genetic conditions (e.g., Gaucher’s disease). More recently, they have become the standard of care for common chronic diseases such as multiple sclerosis (MS) and rheumatoid arthritis (RA).\(^1\)

In 2011, among U.S. privately insured individuals under 65 years of age, spending on specialty drugs accounted for 25% of the total spending for prescription drugs processed via the medical and pharmacy benefit and are forecasted to be 50% in 2018.\(^2\)\(^3\) Specialty drugs processed via the medical benefit account for half of all specialty drug spending.\(^2\) Among 7 million privately insured working age individuals, specialty drugs within the pharmacy benefit accounted for only 1% of the prescriptions but accounted for 17% of total spending; specialty drug spending increased by 20.1% from 2010 to 2011.\(^4\) As a result of these costs, employers have instituted mechanisms such as prior authorization, drug supply restrictions, and limited distribution arrangements for managing spending for these agents.\(^5\)\(^7\) Since spending on specialty drugs continues to rise faster than that of traditional therapies,\(^7\) payers and policymakers must better understand the costs and clinical benefits of these drugs.

Relatively little is known about the utilization of and spending on specialty drugs to manage conditions such as MS, RA, inflammatory bowel disease (IBD), and psoriasis, particularly in the context of individuals’ total health care costs. One reason for this knowledge gap is that the use of specialty drugs and the attribution of member spending across pharmacy and medical benefits is challenging. Access to integrated medical and pharmacy claims data is required in order to determine a member’s specialty drug use and spending across both benefits. For example, some specialty drugs are captured through pharmacy benefit claims, while many more, predominantly those administered through infusions in clinics, are captured through medical benefit claims; data regarding medical and pharmacy benefits are often housed separately and utilize distinct drug coding systems.

We evaluated the specialty drug use and costs for 4 chronic conditions in which specialty drug costs have been increasing: MS, RA, IBD, and psoriasis.\(^2\)\(^3\) These 4 chronic conditions were selected because specialty drugs used to treat these conditions represent the top expenditure specialty drug through the medical benefit (i.e., infliximab) and the top 4 expenditure specialty drugs through the pharmacy benefit (i.e., adalimumab, etanercept, interferon beta-1a, and glatiramer).\(^4\) In addition to specialty drug use and costs, we were also interested in how these costs compared with costs for nonspecialty drugs and total health care costs, as well as the cost growth from 2008 through 2010.

**Methods**

**Data**

We used medical and pharmacy administrative claims data from a Midwest Blue Cross Blue Shield plan to assess prevalence and trends for the selected specialty conditions, costs, and specialty drug use. For study inclusion, we required individuals to have been commercially insured in a managed care plan, continuously enrolled during a given year of analysis, and less than or equal to age 64 during the entire time frame of the study period. We excluded members greater than age 64 because of the potential for incomplete data capture among Medicare beneficiaries. The analysis dataset included all medical and pharmacy claims with total paid amounts, defined as a total of plan paid, member paid, and any third-party payment, such as supplemental insurance.

**Subjects**

We identified 4 separate study cohorts, 1 for each condition of interest, using prespecified criteria. To be included in a condition cohort, we required members to have 1 of the following: (a) 2 separate medical claims with the International Classification of Disease, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis code of interest in any of 5 diagnosis code fields available on the medical claim, (b) 1 medical claim with an ICD-9-CM diagnosis code of interest in any of 5 diagnosis code fields and 1 drug claim used to treat the condition from the medical or pharmacy benefit, or (c) 2 separate drug claims from the pharmacy or medical benefit for drugs to treat the condition. Criteria “c,” defined as drug presence indicates presence of the condition, was used when the drug had an indication for only 1 of the 4 conditions. Appendix A (available in online article) contains the drug list used to identify a plan member as having each condition and an indicator as to whether presence of the drug alone could qualify as having specialty drug treatment (i.e., drug presence indicates presence of the condition). We used the following ICD-9-CM diagnosis codes to define an individual as having a specialty condition: 340.xx for MS; 714.xx or 720.0x for RA; 555.xx or 556.xx for IBD; and 696.0x,
Health Plan Utilization and Costs of Specialty Drugs Within 4 Chronic Conditions

**TABLE 1** Characteristics of Plan Members by Chronic Condition Cohort During 2010

<table>
<thead>
<tr>
<th></th>
<th>Multiple Sclerosis (n = 1,683)</th>
<th>Rheumatoid Arthritis (n = 4,398)</th>
<th>Inflammatory Bowel Disease (n = 4,377)</th>
<th>Psoriasis (n = 3,480)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female, %</strong></td>
<td>73.4</td>
<td>71.3</td>
<td>52.3</td>
<td>49.7</td>
</tr>
<tr>
<td><strong>Age, %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-20 years</td>
<td>0.6</td>
<td>4.5</td>
<td>7.8</td>
<td>12.1</td>
</tr>
<tr>
<td>21-40 years</td>
<td>27.3</td>
<td>15.5</td>
<td>29.0</td>
<td>23.9</td>
</tr>
<tr>
<td>41-50 years</td>
<td>32.3</td>
<td>25.2</td>
<td>26.0</td>
<td>25.0</td>
</tr>
<tr>
<td>51-64 years</td>
<td>39.8</td>
<td>54.8</td>
<td>37.2</td>
<td>39.0</td>
</tr>
<tr>
<td>Treated with any drug for the condition, a %</td>
<td>71.8</td>
<td>86.8</td>
<td>81.6</td>
<td>94.1</td>
</tr>
</tbody>
</table>

*See Appendix A (available in online article) for list of drugs indicating that the condition was treated with a drug (specialty or nonspecialty).

696.1x, or 696.8x for psoriasis. For each year of the analysis, we required plan members to re-qualify as having the specialty condition to be included. Members could contribute to more than 1 condition during any given year of analysis.

**Information About Specialty Drug Utilization and Expenditures**

We collected the medical and pharmacy claims for individuals identified as having 1 of the chronic conditions during the calendar year. We divided each member’s annual total costs of care into 4 mutually exclusive cost categories: medical benefit costs for specialty drugs used to treat the condition (Medical Specialty), all other medical benefit costs (Medical All Other), pharmacy benefit costs for specialty drugs used to treat the condition (Pharmacy Specialty), and all other pharmacy benefit costs (Pharmacy All Other). Appendix A (available in online article) depicts the drugs defined as specialty therapies for each condition of interest; we defined specialty drugs as those with a total paid of $1,000 or more per month. Utilization of each specialty drug chemical entity was quantified at the member level and defined as the presence of at least 1 claim during the analysis year.

**Analysis**

We performed a univariate analysis to describe the study cohorts. Once plan members were placed into their respective condition cohorts, we evaluated members’ total health care costs in terms of the individual members’ average per person per year (PPPY) costs. The PPPY was calculated by summing the costs for all members with the condition and dividing by the number of members with the condition. In addition, we calculated the per member per year (PMPY) costs for the condition by taking the same sum costs for all members with the condition; however, the denominator was the entire health plan enrollment. Over the 3 analysis years (2008 through 2010), we trended by condition: prevalence, prevalence of specialty drug use among members, per person total cost (i.e., PPPY) and cost for each of the 4 mutually exclusive cost categories, and per person total cost among members (i.e., PMPY) utilizing specialty drugs for a given condition. Lastly, we calculated the 3-year compound annual growth rate.

**Results**

**Subjects**

In 2010, there were a total of 1,685, 4,398, 4,377, and 3,480 individuals identified in the MS, RA, IBD, and psoriasis cohorts, respectively (Table 1 and Appendix B [available in online article]). The cohort sizes were similar in 2008 and 2009. More than 70% of the cohort was female for MS and RA, while approximately 50% were female for the IBD and psoriasis cohorts. In 2010, the percentage of members treated with any drug (specialty or nonspecialty) was high across the 4 conditions, ranging from 71.8% for MS to 94.1% for psoriasis.

**Prevalence of Conditions and Specialty Drug Use**

Among the conditions of interest, the prevalence ranged from a low of 1,720 per million members for MS to a high of 4,489 per million members with RA (Table 2a). The rates of specialty drug utilization varied substantially across the 4 conditions. The rate of specialty drug use was lowest for IBD (13.7%), followed by psoriasis (24.3%), RA (35.4%), and highest for MS (71.8%) in 2010. Over the 3 years, the proportion of members with an MS condition utilizing a specialty drug increased from 70.8% to 71.8%, and for RA specialty drug utilization, the proportion of members increased from 34.6% to 35.4% (Appendix B, available in online article). The proportion of members with a psoriasis condition and specialty drug utilization increased over the 3 years from 20.3% to 24.3%, while specialty drug utilization among the IBD cohort increased from 10.8% to 13.7%.

**Costs of Specialty Drugs and Total Health Care**

In 2010, the average PPPY total health care cost for individuals across the 4 conditions varied by a factor of almost 2.5 times (Table 2a). The lowest total annual health care cost was for psoriasis ($14,815) and highest for MS ($36,901). Across the entire population enrolled in 2010 (n=979,735), the PMPY
Health Plan Utilization and Costs of Specialty Drugs Within 4 Chronic Conditions

### TABLE 2a
Prevalence, Treatment, Rates, and Costs by Chronic Condition Cohort Among All Members During 2010

<table>
<thead>
<tr>
<th>Condition</th>
<th>Diagnosed per Million Members</th>
<th>Treated with Specialty Drug</th>
<th>Average PPPY Total Health Care Costa</th>
<th>Annual PPPY Growth in Cost of Care 2008-2010b</th>
<th>Condition PMPY Total Health Care Costd</th>
<th>Specialty Drug PMPY Total Health Care Coste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple sclerosis</td>
<td>1,720</td>
<td>71.8</td>
<td>36,901</td>
<td>11.4</td>
<td>63.46</td>
<td>34.74</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>4,489</td>
<td>35.4</td>
<td>19,830</td>
<td>8.0</td>
<td>103.82</td>
<td>28.74</td>
</tr>
<tr>
<td>Inflammatory bowel disease</td>
<td>4,468</td>
<td>13.7</td>
<td>22,070</td>
<td>5.7</td>
<td>98.60</td>
<td>13.09</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>3,552</td>
<td>24.3</td>
<td>14,815</td>
<td>7.5</td>
<td>52.62</td>
<td>16.91</td>
</tr>
</tbody>
</table>

aSpecialty drugs are defined in Appendix A (available in online article).
bPPPY = per person per year, costs reflected the total allowed amount defined as the sum of member paid, plan paid, and coordination of benefits paid to the provider.
cGrowth derived using the compound annual growth rate.
dPMPY = per member per year, condition attributable costs as described in the Methods section of this article.
eSpecialty drug costs included medical and pharmacy spending.

### TABLE 2b
Prevalence, Treatment, Rates, and Costs by Chronic Condition Among Specialty Drug Users During 2010

<table>
<thead>
<tr>
<th>Condition</th>
<th>Average PPPY Total Health Care Costa ($)</th>
<th>Average PPPY Specialty Drug Costb ($)</th>
<th>Specialty Drug Cost as Percent of Total Cost of Care (%)</th>
<th>Annual Growth in Specialty Drug Cost PPPY 2008-2010d (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple sclerosis (n=1,209)</td>
<td>41,760</td>
<td>28,152</td>
<td>67.4</td>
<td>18.0</td>
</tr>
<tr>
<td>Rheumatoid arthritis (n=1,556)</td>
<td>34,163</td>
<td>18,098</td>
<td>53.0</td>
<td>5.6</td>
</tr>
<tr>
<td>Inflammatory bowel disease (n=598)</td>
<td>42,642</td>
<td>21,438</td>
<td>50.3</td>
<td>8.5</td>
</tr>
<tr>
<td>Psoriasis (n=845)</td>
<td>29,565</td>
<td>19,612</td>
<td>66.3</td>
<td>4.4</td>
</tr>
</tbody>
</table>

aPPPY = per person per year, costs reflected the total allowed amount defined as the sum of member paid, plan paid, and coordination of benefits paid to the provider.
bSpecialty drugs are defined in Appendix A (available in online article).
cGrowth derived using the compound annual growth rate.

costs were highest for RA ($103.82) and lowest for psoriasis ($52.62). However, the PMPY costs for specialty drugs across the entire population were highest for MS ($34.74) and lowest for IBD ($13.09). The most commonly used specialty drugs for each of the conditions were glatiramer (MS), etanercept (RA and psoriasis), and infliximab (IBD).

Among specialty drug users for each of the cohorts, the annual costs of specialty drugs accounted for 50% or more of the total annual direct cost of care (Table 2b). For psoriasis patients, costs were more than double among specialty drug users compared with all the psoriasis members ($29,565 vs. $14,815). By contrast, the total costs were only somewhat higher among MS members using specialty drugs ($41,760 vs. $36,901). In addition, the annual spending growth for specialty drug costs ranged from 4.4% for psoriasis up to 18.0% for MS between 2008 and 2010.

**Proportion and Spending Growth by Category**

Figure 1 shows the proportion of spending by each of the 4 mutually exclusive cost categories for each condition from 2008 through 2010. For MS, specialty drugs accounted for 48.1% of annual spending in 2008. This increased to almost 54.7% of total spending in 2010. For RA, the proportion of total health care spending on specialty drugs stayed stable (28.3% in 2008 and 27.7% in 2010). For IBD, the proportion of total health care spending on specialty drugs increased from 9.9% in 2008 to 13.3% in 2010. The proportion of spending on specialty drugs for psoriasis increased from 28.5% in 2008 to 32.1% in 2010. As shown in Table 2a, the annual growth rate for total annual health care costs from 2008 to 2010 ranged from 5.7% (IBD) to 11.4% (MS).

**Discussion**

In this study of commercially insured members from a midwestern state, we examined trends in condition prevalence, treatment, and spending for specialty drugs among those with MS, RA, IBD, or psoriasis. There was a gradual increase in use of specialty drugs for the management of these chronic conditions between 2008 and 2010. In addition, specialty therapies accounted for an increasing share of all health care costs for the conditions examined. These findings are important given the magnitude of spending on specialty therapies that was documented and the increasing pressure on insurers to optimize the value that these therapies can provide.
The importance of the chronic conditions studied is exemplified in the finding that fewer than 1.5% of enrollees in the health plan we examined had 1 of the 4 conditions of interest, but they accounted for 7.2% of the entire plan membership health care expenditures. In addition, the growth rate in expenditures for the conditions was 5.7% to 11.4%, which is 32.6% to 165.1% higher than the 4.3% national health consumption expenditure growth rate over the same time period. The specialty drug expenditure growth of 4.4% to 18.0% also exceeded the national health consumption expenditure growth rate.

Although we did not find any change in the psoriasis or MS condition prevalence rates, over the 3 years we found increased prevalence of IBD (7.0%) and RA (9.7%). Our findings demonstrated that specialty drug utilization increased almost 30% over 3 years for members with IBD; however, utilization of specialty drugs to treat RA remained relatively stable. Increased use of specialty drugs may not be associated with changes in disease prevalence, and specialty drug use trends appear to be condition specific. In addition, new specialty drugs for these conditions continue to be approved by the FDA. For example, tofacitinib (Xeljanz) was recently approved by the FDA for treatment of moderate to severe RA and is expected to cost approximately $25,000 per year of treatment. This will require both payers and providers to determine the comparative effectiveness of the new agents and their appropriate place in therapy.

Both payers and employers are expecting high-cost specialty drugs to prevent disability, which will then lead to improved quality of life and work productivity. Unfortunately, the evidence supporting long-term disability prevention is lacking for MS specialty drugs. By contrast, specialty drugs used to treat RA and IBD conditions have clinical trial data suggesting significantly delayed disability or disease remission; however, the incremental benefit over traditional generic disease-modifying agents such as methotrexate is not clear. As insurers develop chronic disease care management programs, a key goal of the programs is to improve medication adherence. Increasing specialty drug adherence for chronic conditions will increase costs and may increase them substantially; however, this may be of greater value than partial use due to nonadherence, which may be less likely to translate into meaningful outcomes. We did not find evidence to suggest that the increases in specialty drug costs have been offset by reductions in expenditures from...
other types of health care utilization. For example, among members treated with specialty drugs, more than half their total cost of care was attributed to specialty drug expenditures. The specialty drugs would need to eliminate all other medical costs to become cost neutral, which is unforeseeable.

These study findings, coupled with the forecast that specialty drugs will account for 50% of all drug expenditures in the next 5 years,\(^2\) will necessitate that health care payers manage specialty drug costs and optimize value through drug management programs. As shown in Figure 2, specific specialty management programs and policies include the following: (a) channel management that may result in narrowing the specialty drug pharmacy provider network to a limited number of dispensing pharmacies in order to obtain greater unit cost discounts; (b) contracting and rebates that may result in pharmaceutical manufacturer inflationary price protection and rebate optimization via formulary preferred product(s) steerage; (c) implementing utilization management or medical policy pre-authorization to prevent unsafe use or investigational use including requirements to try the preferred formulary product(s) prior to the nonpreferred product(s); and (d) coordination of care between the medical and pharmacy benefit clinical care teams, for example, disease management and specialty pharmacy care management.\(^7,16-19\) The goals of these programs include helping members understand and manage their conditions; providing guidance in using health care resources judiciously; maintaining or improving adherence to the member’s care plan, including specialty drug therapy; and obtaining best pricing.

To obtain improved management and cost containment for specialty drugs billed through the medical benefit, payers may consider the following: (a) forcing billing to the pharmacy benefit to allow for greater transparency and less erroneous or fraudulent billing, (b) recontracting with the medical billing provider for specific drug discounts, and (c) limiting the provider site of care specialty drug channel delivery. Examples of medical provider sites of care include the free-standing physician clinic (professional office) unaffiliated with a hospital, outpatient hospital (facility) clinics, inpatient hospital (facility), or the patient’s home. Because these sites of care are generally associated with their own provider contracts, the specialty drug discounts may vary widely.\(^10\)

**Limitations**

Our analysis has several limitations. First, we examined the utilization and cost patterns of a population of privately insured individuals from 1 health plan that was confined to 1 state. Utilization and expenditure patterns may differ among other populations, such as older adults and those in different regions of the country. Second, we did not have information regarding members’ disease severity or clinical outcomes. Further work is needed to characterize the clinical stage at which specialty drugs are used and their effect on clinical and patient-reported outcomes. Finally, this was a descriptive, observational study, rather than one to characterize predictors of specialty drug use.

**Conclusions**

The use of specialty drugs to treat chronic conditions has increased gradually over the last few years. When specialty drugs are used for chronic conditions such as MS, RA, psoriasis, and IBD, they now account for more than 50% of the total cost of care. The agents have resulted in significant increases in treatment costs with limited published evidence of a direct medical cost offset. As specialty drugs fuel the rise in total cost of care for these conditions, it will be important for policymakers and payers to vigilantly analyze their medical and pharmacy benefit specialty drug cost trends and focus management activities on specialty drugs. These management activities include coordinated medical and pharmacy benefit formularies; specialty benefit designs; and specialty drug management programs, which include optimizing the drug distribution channel, utilizing management programs, contracting with pharmaceutical manufacturers for rebates and inflationary price protection, and coordinating care management through the medical and pharmacy benefits to maximize the value specialty drugs can provide.
Health Plan Utilization and Costs of Specialty Drugs Within 4 Chronic Conditions

DISCLOSURES

Alexander is an ad hoc member of the U.S. Food and Drug Administration’s Drug Safety and Risk Management Advisory Committee and is a consultant for IMS Health. Starner, Gunderson, and Gleason are employees of Prime Therapeutics. Ritter is an employee of Blue Cross Blue Shield of Minnesota. Alexander is supported by the Agency for Healthcare Research and Quality (RO1 HS018960). The funding source had no role in the design and conduct of the study, analysis or interpretation of the data, and preparation or final approval of the manuscript prior to publication.

Study concept and design were contributed by Gleason, Alexander, and Shah, with assistance from Starner, Gunderson, and Ritter. Data collection was performed by Gleason, Starner, Van Houten, and Gunderson; and data interpretation was primarily the work of Ritter, Gunderson, and Gleason, with assistance from Starner, Van Houten, and Shah. The manuscript was written by Gleason, Alexander, Starner, and Shah, and was revised by Gleason, Ritter, and Shah, with assistance from Alexander, Starner, Van Houten, and Gunderson.

REFERENCES


### Health Plan Utilization and Costs of Specialty Drugs Within 4 Chronic Conditions

#### APPENDIX A  Drugs Used in the Analysis to Identify Condition Presence, Treatment, and Specialty Classification

<table>
<thead>
<tr>
<th>Drugs Used to Treat Condition</th>
<th>Generic Product Identifier (Medi-Span)</th>
<th>Healthcare Common Procedure Coding System</th>
<th>Drug Presence Indicates Presence of Condition</th>
<th>Specialty Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inflammatory bowel disease</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>certolizumab (Cimzia)</td>
<td>52505020</td>
<td>C9249, J0718</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>infliximab (Remicade)</td>
<td>52505040</td>
<td>J1745</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>golimumab (Simponi)</td>
<td>66270040</td>
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<td>No</td>
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</tr>
<tr>
<td>adalimumab (Humira)</td>
<td>66270015</td>
<td>J0135</td>
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<td>etanercept (Enbrel)</td>
<td>6629</td>
<td>J1438</td>
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<tr>
<td>natalizumab (Tysabri)</td>
<td>624050</td>
<td>J2323, Q4079</td>
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<tr>
<td>aminosaliclylates</td>
<td>525000</td>
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<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>corticotropin (Acthar gel)</td>
<td>303000100040</td>
<td>J0800</td>
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<td>66270040</td>
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<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>adalimumab (Humira)</td>
<td>66270015</td>
<td>J0135</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>etanercept (Enbrel)</td>
<td>6629</td>
<td>J1438</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>coal tar products</td>
<td>9052</td>
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<td>Yes</td>
<td>No</td>
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<td>anthralin, calcipotriene, calcitriol, tazarotene (other topicals for psoriasis)</td>
<td>902500</td>
<td>none</td>
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<td>No</td>
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<tr>
<td>corticotropin (Acthar gel)</td>
<td>303000100040</td>
<td>J0800</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td><strong>Multiple sclerosis</strong></td>
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<td></td>
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<tr>
<td>glatiramer (Copaxone)</td>
<td>62400030</td>
<td>J1595, Q2010</td>
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<td>interferon beta-1a (Rebif)</td>
<td>624030604520</td>
<td>C9399, Q3026</td>
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<td>interferon beta-1b (Betaseron)</td>
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<td>J9293</td>
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<td>J0800</td>
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<td>Yes</td>
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<td>J0135</td>
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<td>Yes</td>
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<td>golimumab (Simponi)</td>
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<td>No</td>
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<td>Yes</td>
<td>No</td>
</tr>
<tr>
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<td>6629</td>
<td>J1438</td>
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<td>Yes</td>
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<tr>
<td>abatacept (Orencia)</td>
<td>6640</td>
<td>C9230, J0129</td>
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<td>Yes</td>
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<td>tocilizumab (Actemra)</td>
<td>6650</td>
<td>C9264, J3262</td>
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<td>Yes</td>
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<td>auranofin, aurothioglucone, gold sodium thiomalate (gold salts)</td>
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<td>J1600, X6262, X6264</td>
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<td>No</td>
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<tr>
<td>corticotropin (Acthar gel)</td>
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<td>J0800</td>
<td>No</td>
<td>Yes</td>
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</tbody>
</table>
Health Plan Utilization and Costs of Specialty Drugs Within 4 Chronic Conditions

**APPENDIX B**

Flowchart of Member Identification, Condition Prevalence, Total Health Care Cost, and Specialty Costs

```
2.5 million members with any eligibility in 2008, 2009, or 2010

1,038,638 members less than aged 65 years continuously enrolled in all of 2008
- 1,677 per 1,000,000 with a diagnosis of Multiple Sclerosis
  - 70.8% of members with a specialty drug claim (pharmacy or medical benefit)
  - Average annual total cost of care $29,751
  - Specialty specific costs $14,311 (48.1%)

999,048 members less than aged 65 years continuously enrolled in all of 2009
- 1,714 per 1,000,000 with a diagnosis of Multiple Sclerosis
  - 71.2% of members with a specialty drug claim (pharmacy or medical benefit)
  - Average annual total cost of care $33,645
  - Specialty specific costs $17,672 (52.5%)

979,735 members less than aged 65 years continuously enrolled in all of 2010
- 1,720 per 1,000,000 with a diagnosis of Multiple Sclerosis
  - 71.8% of members with a specialty drug claim (pharmacy or medical benefit)
  - Average annual total cost of care $36,901
  - Specialty specific costs $20,200 (54.7%)

1,677 per 1,000,000 with a diagnosis of Rheumatoid Arthritis
- 34.6% of members with a specialty drug claim (pharmacy or medical benefit)
- Average annual total cost of care $19,830
- Specialty specific costs $5,612 (28.3%)

4,093 per 1,000,000 with a diagnosis of Rheumatoid Arthritis
- 34.2% of members with a specialty drug claim (pharmacy or medical benefit)
- Average annual total cost of care $22,021
- Specialty specific costs $5,824 (26.4%)

3,513 per 1,000,000 with a diagnosis of Psoriasis
- 20.3% of members with a specialty drug claim (pharmacy or medical benefit)
- Average annual total cost of care $12,813
- Specialty specific costs $3,651 (28.5%)

3,601 per 1,000,000 with a diagnosis of Psoriasis
- 23.1% of members with a specialty drug claim (pharmacy or medical benefit)
- Average annual total cost of care $14,605
- Specialty specific costs $4,244 (29.1%)

4,213 per 1,000,000 with a diagnosis of Inflammatory Bowel Disease
- 10.8% of members with a specialty drug claim (pharmacy or medical benefit)
- Average annual total cost of care $19,767
- Specialty specific costs $1,962 (9.9%)

4,409 per 1,000,000 with a diagnosis of Inflammatory Bowel Disease
- 12.1% of members with a specialty drug claim (pharmacy or medical benefit)
- Average annual total cost of care $20,755
- Specialty specific costs $2,481 (12.0%)

4,468 per 1,000,000 with a diagnosis of Inflammatory Bowel Disease
- 13.7% of members with a specialty drug claim (pharmacy or medical benefit)
- Average annual total cost of care $22,070
- Specialty specific costs $2,929 (13.3%)
```
Effect of an Educational Outreach Program on Prescribing Potential Drug-Drug Interactions

Daniel C. Malone, RPh, PhD; Joshua N. Liberman, PhD; and Diana Sun, MS

ABSTRACT

BACKGROUND: The topic of improving prescribing practices is a major focus of many national initiatives, not only to enhance the quality of health care but also to reduce medical care costs. Educational outreach (also known as academic detailing) is a type of postgraduate education where trained clinical consultants meet face-to-face with prescribers to provide one-on-one information. Ideally, such visits promote evidence-based knowledge, create trusting relationships, and induce practice change, particularly with regard to prescribing potentially interacting medications.

OBJECTIVE: To evaluate the effect of an educational outreach program delivered by clinical pharmacists on reducing the rate of prescribing potential drug-drug interactions (DDIs).

METHODS: The intervention was a prescriber-directed educational outreach program focused on 25 clinically important DDIs. The effect of the educational outreach was evaluated using a retrospective pre-post study design with a control group was conducted. A total of 19,606 prescribers were educated on the DDIs of interest. A control group of 19,606 prescribers, matched on prescribing volume and who did not receive the educational session were selected. Multivariate regression models were used to assess the impact of the educational program on the rate of prescribing potential DDIs.

RESULTS: The 2 groups were significantly different with respect to age, profession, specialty, and geographic region. At baseline, mean DDI rates per 100 drug prescriptions were 0.8 and 0.7 for prescribers who received the educational session and those who did not, respectively. Following delivery of the educational outreach program, mean potential DDI rates increased to 1.46 and 1.53 per 100 precipitant drug prescriptions, an increase of 13.9% and 9.15% for the intervention and control groups, respectively.

CONCLUSION: The current study was not able to demonstrate a significant beneficial effect of the educational outreach program on reducing the rate of prescribing potential DDIs.

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What is already known about this subject

• Inappropriate prescribing can be associated with suboptimal disease management and increased risks and costs to both patients and health care systems. Inappropriate prescribing can be associated with lower levels of morbidity and mortality, as well as increased medical care expenditures. Previous research has attempted to identify important factors that are associated with inappropriate prescribing, including increased rates of prescribing interacting medications. For example, in a review of literature evaluating nonregulatory measures to improve physician-prescribing behavior, inability to keep up with the latest developments in...
Effect of an Educational Outreach Program on Prescribing Potential Drug-Drug Interactions

terms of new pharmaceutical products and modified formulations of existing ones was found to be associated with inappropriate prescribing practices.\(^\text{12}\)

Enhancing providers’ knowledge of pharmacotherapy can help reduce the rate of prescribing potentially interacting medications.\(^\text{13}\) Different interventions have been designed and delivered in an attempt to improve providers’ prescribing knowledge.\(^\text{12}\) Examples of such interventions include dissemination of printed educational material, group education, feedback of physician-specific prescribing patterns, reminders at the time of prescribing, and one-to-one education.\(^\text{12}\) However, evidence regarding the effectiveness of many of these programs is not consistent.\(^\text{14}\) There is evidence to suggest that reminder systems and educational outreach visits are usually more effective than other interventions.\(^\text{15}\)

Educational outreach visits by appropriately trained consultants have consistently demonstrated effectiveness in improving providers’ prescribing in clinical practice settings.\(^\text{12,16}\) Based on the principles of educational outreach, such visits utilize one-on-one interactive marketing provided by clinical consultants, who have been trained to discuss prescribing decisions with providers in a manner likely to induce an evidence-based practice change.\(^\text{17}\) In order to reduce exposure to clinically important drug-drug interactions (DDIs), a partnership was established between a large pharmacy benefit management company (PBM) and 3 academic institutions (University of Arizona, Albert Einstein College of Medicine, and University of Washington), with funding from the Centers for Disease Control and Prevention, to design and deliver a prescriber-directed educational outreach program. The educational outreach intervention involved an audio taped educational program on specific DDIs that clinical pharmacists were able to view at their convenience. Clinical consultants then could provide the entire program, or relevant components of the program, to providers who may benefit from the information based on their previous prescribing habits. This educational outreach focused on 25 clinically important DDIs that are likely to be encountered in ambulatory care settings, which was developed by Malone et al. (2004).\(^\text{18}\) The purpose of this study was to evaluate the impact of educational outreach by clinical consultants on reducing the rate of prescribing potential DDIs.

## Methods

### Study Design

This study employed a retrospective pre-post design with a control group to evaluate the impact of prescriber-directed educational outreach program related to clinically important DDIs. The primary outcome was the rate of prescribing interacting medications, defined as the sum of all unique DDIs divided by the total number of drug prescriptions at the prescriber level.

### Participant Selection

Health care providers were identified using the PBM’s clinical consultants’ contacts database. Of these providers, those in the top 30% were selected to receive the educational outreach visits because they were considered high-volume prescribers, as measured by prescription claim counts and drug costs for the intervention group. A total of 19,606 prescribers were educated on DDIs of interest for this study. The control group, which did not receive the educational outreach intervention, included a stratified random sampling of prescribers who were frequency matched to the intervention group on the number of prescription drug pharmacy claims submitted by their patients at baseline. The intervention and control groups were not stratified by practice site, and both groups were national in scope.

### Intervention Procedures

The intervention was a prescriber-directed educational outreach program based on the principles of academic detailing.\(^\text{19}\) Training of clinical consultants was delivered jointly by the University of Arizona—based on clinical content developed by the University of Arizona, Albert Einstein College of Medicine—and the University of Washington. Clinical consultants were PharmD trained. Two investigators created a Microsoft PowerPoint presentation and narrated an audio-taped presentation on the development of the clinical content, as well as the clinical information itself. Information on the mechanism of each interaction, along with details related to the actual clinical management was also provided. Summary materials were converted to a document that included the various drug pairs, the clinical consequences of interaction, and alternative management strategies.

Over a 3-month period following the training, clinical consultants visited 19,606 providers to educate them about these interactions. There were approximately 120 clinical consultants in 124 geographical areas across the United States, with most areas incorporating urban or suburban populations. They delivered the educational outreach program to approximately 150 providers every 6 to 8 weeks. There was no requirement that prescribers in either the intervention or control groups had previously prescribed a medication involved in an interaction of interest. Thus, the relevance of the educational intervention likely varied by type of practice and subspecialty. However, all clinicians should be aware of clinically important interactions because they could encounter a patient at risk for an interaction.

Data for determining the frequency of clinically important DDIs were obtained from pharmacy records for the PBM’s enrollees. The baseline prescribing patterns of the 25 DDIs were assessed over a pre-intervention period from January 1, 2003, to September 30, 2003. Visits by clinical consultants to prescribers discussing the interactions occurred from October 1, 2003, to December 31, 2003. Postintervention prescribing patterns of clinically important DDIs were assessed.
over a period of 9 months, starting January 1, 2004, and ending September 30, 2004. The University of Arizona Human Subjects Protection Program approved the protocol for this study.

**Statistical Analysis**

The 2 study groups, namely the intervention and control groups, were evaluated with respect to age, profession, specialty, geographic region, number of prescription claims, and mean rates of prescribing clinically important potential DDI s at baseline. The number of unique persons for whom a medication was prescribed by each provider was determined and summarized at the group level. No attempt was made to differentiate between interactions involving a single prescriber or interactions involving multiple prescribers.

A multivariate analysis was conducted to assess the impact of the educational program on the rate of prescribing potential DDI s. A Poisson regression model was used to estimate the effect of the educational program on prescribing clinically important DDI s during the follow-up period. The model accounted for baseline DDI rates, baseline number of pharmacy claims, age, profession, specialty, and geographic region. Given the disproportionate representation of warfarin interactions in this study, multivariate analysis was performed with and without warfarin interactions. The results are presented as rate ratios (RR) with 95% confidence intervals (CI). The analysis was conducted using SAS version 9.1 (SAS Institute, Cary, NC).

**Results**

The prescribers assigned to the intervention and control groups were significantly different in age, profession, specialty, geographic region, and baseline rate of potential DDI prescribing (Table 1). Of particular importance for DDI prescribing, the intervention group had a higher proportion of physicians and cardiologists as opposed to the control group. Though the prescriber groups were matched on number of baseline pharmacy claims, the mean DDI rates per 100 drug prescriptions were 0.8 and 0.7 for prescribers who received the educational session and those who did not, respectively (P<0.001). Given the extremely large sample size of this study, significant differences between the groups were observed for almost every demographic characteristic evaluated.

During the follow-up period, the rates were 1.46 and 1.53 potential DDI s per 100 precipitant drug prescriptions for prescribers who received the educational session and those who did not, respectively (P=0.388). Interactions involving warfarin and other anticoagulants accounted for 88% and 85% of all DDI s at baseline in the intervention and nonintervention groups, respectively. During the follow-up period, these interactions accounted for 90% and 88% of all DDI s in the intervention and nonintervention groups, respectively. Interactions involving warfarin with nonsteroidal anti-inflammatory drugs (NSAIDs) accounted for more than 50% of

![Table 1: Baseline Characteristics of Study Participants](image-url)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Prescribers Who Were Educated About the DDIs of Interest*</th>
<th>Control Group</th>
<th>P Value</th>
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</thead>
<tbody>
<tr>
<td>Total N</td>
<td>19,606</td>
<td>19,606</td>
<td></td>
</tr>
<tr>
<td>Age (mean ± SD)</td>
<td>52.3 (0.06)</td>
<td>51.2 (0.07)</td>
<td>&lt;0.001</td>
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<tr>
<td>Profession</td>
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<td></td>
</tr>
<tr>
<td>Physician</td>
<td>19,494 (99.4)</td>
<td>17,616 (89.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Nurse practitioner</td>
<td>3 (0.02)</td>
<td>177 (0.9)</td>
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<tr>
<td>Physician assistant</td>
<td>3 (0.02)</td>
<td>155 (0.8)</td>
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<tr>
<td>Dentist</td>
<td>9 (0.05)</td>
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<tr>
<td>Otherb</td>
<td>97 (0.49)</td>
<td>1,474 (7.5)</td>
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<tr>
<td>Specialty</td>
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<tr>
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<td>591 (3.0)</td>
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<td>Emergency</td>
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<td>153 (0.8)</td>
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<td>251 (1.3)</td>
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<td>5,382 (27.4)</td>
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<td>34 (0.2)</td>
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<td>Gastroenterology</td>
<td>2,502 (12.8)</td>
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<td>Internal medicine</td>
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<td>4,714 (24.0)</td>
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</tr>
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<td>Obstetrics/gynecology</td>
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<td>970 (5.0)</td>
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<td>Pediatrics</td>
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<td>4,266 (21.8)</td>
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<tr>
<td>Central</td>
<td>4,876 (24.9)</td>
<td>2,996 (15.3)</td>
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<td>Midwest</td>
<td>504 (2.6)</td>
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<tr>
<td>Rocky Mountain</td>
<td>748 (3.8)</td>
<td>704 (3.6)</td>
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<td>West</td>
<td>1,443 (7.4)</td>
<td>1,920 (9.8)</td>
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<tr>
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<table>
<thead>
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<th>Pharmacy claims at baseline</th>
<th>Prescribers Who Were Educated About the DDIs of Interest*</th>
<th>Control Group</th>
<th>P Value</th>
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</thead>
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<td>1-500</td>
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<td>1,818 (9.3)</td>
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</tr>
<tr>
<td>500-1,000</td>
<td>1,944 (9.9)</td>
<td>1,944 (9.9)</td>
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<td>1,001-1,500</td>
<td>2,587 (13.2)</td>
<td>2,587 (13.2)</td>
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<td>1,501-2,000</td>
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</tr>
<tr>
<td>2,001-2,500</td>
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<td>2,297 (11.7)</td>
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</tr>
<tr>
<td>2,501-3,000</td>
<td>2,023 (10.3)</td>
<td>2,023 (10.3)</td>
<td></td>
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<tr>
<td>3,001-4,000</td>
<td>2,721 (13.9)</td>
<td>2,721 (13.9)</td>
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<tr>
<td>4,001-5,000</td>
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<td>1,619 (8.3)</td>
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<tr>
<td>5,000+</td>
<td>1,875 (9.6)</td>
<td>1,875 (9.6)</td>
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</tr>
</tbody>
</table>

*One physician in the educational program group had no prescriptions during the baseline period and was excluded from the analysis.

bOther category includes individuals licensed to prescribe medications within their jurisdictions and includes such specialties as podiatrists, optometrists, and pharmacists.

©Statistics calculated excluding the Other, missing category.

DDI = drug-drug interaction; SD = standard deviation.
interactions involving anticoagulants in both groups during the baseline and follow-up periods. Table 2 illustrates prescribing patterns of the 25 clinically important DDIs in both groups and the percentage of change during the period following the delivery of the educational program. At the end of the educational program, there was a 13.9% increase in prescribing potential DDIs among prescribers receiving the educational sessions compared with 9.15% in the control group. The distribution of DDIs written by the same prescriber during the follow-up period is shown in Table 3. The group of physicians who received the educational sessions had significantly lower rates of DDIs (per 100 precipitant drug prescriptions) involving anti-infective medications and monoamine oxidase inhibitors (P < 0.001). However, this group had significantly higher rates of DDIs involving anticoagulants (P < 0.001).

Multivariate analysis indicated that educational outreach intervention appeared to have no effect on the rate of prescribing potential DDIs (Tables 4 and 5). Compared with the control group, prescribing potential DDIs was more likely among physicians who received the educational outreach intervention (RR = 1.013, 95% CI = 0.997-1.030). The difference between the 2 groups did not reach statistical significance when warfarin-related interactions were excluded from the analysis. Older prescribers and those with DDIs at baseline were significantly more likely to prescribe potentially interacting medications. Similarly, compared with other specialty groups, cardiologists were significantly more likely to prescribe potentially interacting medications.

**Discussion**

Improving prescribing practices has become a major focus of the efforts not only to enhance the quality of health care but also to reduce medical care costs. More importantly, prescribing decisions can have a substantial impact on patient safety. Inappropriate prescribing, including prescribing potentially interacting medications, is closely associated with drug-related adverse events. A study showed that 35% of ambulatory care patients using 5 or more medications experienced an

<p>| TABLE 2 | Distribution and Percentage Change of Prescribing Potential DDIs at Baseline and Follow-up |</p>
<table>
<thead>
<tr>
<th>DDIs</th>
<th>Prescribers Who Were Educated About the DDIs of Interest*</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (Baseline)</td>
<td>N (Follow-up)</td>
</tr>
<tr>
<td>Cyclosporine-rifampicin</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Anorexiant/CNS stimulants-MAOIs</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>SSRIs-MAOIs</td>
<td>142</td>
<td>129</td>
</tr>
<tr>
<td>Ganciclovir-zidovudine</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Nitrates-sildenafil</td>
<td>722</td>
<td>801</td>
</tr>
<tr>
<td>Thiopurines-allopurinol</td>
<td>76</td>
<td>97</td>
</tr>
<tr>
<td>Methotrexate-trimethoprim</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Anticoagulants-barbiturates</td>
<td>1,889</td>
<td>2,056</td>
</tr>
<tr>
<td>Meperidine-MAOIs</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Sympathomimetics-MAOIs</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>Dextromethorphan-MAOIs</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Anticoagulants-Thyroid hormones</td>
<td>9,784</td>
<td>14,189</td>
</tr>
<tr>
<td>Benzodiazepines-azole antifungals</td>
<td>2,417</td>
<td>2,362</td>
</tr>
<tr>
<td>Warfarin-sulfapyridine</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Ergot alkaloids-macrolide antibiotics</td>
<td>106</td>
<td>88</td>
</tr>
<tr>
<td>Carbamazepine-propranolol</td>
<td>743</td>
<td>724</td>
</tr>
<tr>
<td>Pimozide-macrolide antibiotics</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Pimozide-azole antifungals</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Theophyllines-quinoines</td>
<td>782</td>
<td>615</td>
</tr>
<tr>
<td>Digoxin-clarithromycin</td>
<td>1,484</td>
<td>1,227</td>
</tr>
<tr>
<td>Warfarin-NSAIDs</td>
<td>27,810</td>
<td>30,279</td>
</tr>
<tr>
<td>Oral contraceptives-rifampin</td>
<td>21</td>
<td>31</td>
</tr>
<tr>
<td>Theophyllines-fluvoxamine</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Warfarin-cimetidine</td>
<td>564</td>
<td>478</td>
</tr>
<tr>
<td>Warfarin-fabric acids</td>
<td>8,319</td>
<td>9,450</td>
</tr>
<tr>
<td>Total DDIs</td>
<td>55,021</td>
<td>62,607</td>
</tr>
</tbody>
</table>

*One physician in the educational program group had no prescriptions during the baseline period and was excluded from the analysis.

DDI = drug-drug interaction, CNS = central nervous system, MAOI = monamine oxidase inhibitors, NA = not applicable, NSAID = nonsteroidal anti-inflammatory drug, SSRI = selective serotonin-reuptake inhibitor.
adverse drug event, and 29% required health care services for an adverse drug event.\textsuperscript{21} Given that DDIs are often predictable (based on previous reports, clinical studies, and an understanding of pharmacological principles), enhancing prescribers’ knowledge can be critical to reducing the rate of prescribing potentially interacting medications.\textsuperscript{20} Educational outreach visits to prescribers by clinical consultants, who are appropriately trained, is one method that has been shown to be effective in inducing prescribing patterns.

The current study evaluated the impact of an educational outreach intervention delivered by clinical pharmacists on reducing the rate of clinically important DDIs. This study was not able to demonstrate a beneficial effect of the educational outreach program on reducing the rate of prescribing potential DDIs. This finding is consistent with evidence from past research that reported varying levels of effectiveness and/or persistence of effect from prescriber educational programs.\textsuperscript{22-30} However, the lack of effect may be due to several factors that are important in detecting significant changes in prescribing practices.

The educational outreach program selected providers with the highest prescribing rates and the highest medication costs instead of those with the highest rates of prescribing selected potential DDIs. Focusing on prescribers who are in most need of an educational outreach program is important to yield substantial savings or improvement in care.\textsuperscript{31} For example, Avorn and Soumerai (1983) found that educational outreach visits targeting physicians who were moderate to heavy prescribers of 1 or more problematic drug categories resulted in a 14% reduction in prescribing these drugs compared with the control group (\(P = 0.0001\)).\textsuperscript{16} Similarly, in a statewide educational program to improve antibiotic prescribing in office practice, Schaffner et al. (1983) reported a reduction of 18% in the number of doctors prescribing these medications, 44% in the number of patients per doctor receiving these drugs, and 54% in the number of prescriptions written per doctor.\textsuperscript{32} A pilot study evaluating the use of a clinical pharmacist as a therapeutics adviser to modify antibiotic prescribing by general practitio-

ners showed that academic detailing was successful in modifying prescribing patterns and decreasing prescription numbers and costs.\textsuperscript{33} In particular, physicians in the intervention group prescribed significantly more antibiotics than were recommended for first-line treatment in the post- vs. predetailing periods, whereas physicians in the control group prescribed significantly more drugs that were not recommended.

In the present study, educational outreach visits pertaining to DDIs were only offered once by clinical consultants. Other educational programs were delivered to the intervention prescribers over time besides the one specific to interactions. Yet, according to Soumerai and Avorn (1990), repetition and reinforcement visits are essential to increasing success rates of educational outreach programs.\textsuperscript{30} Given the rapid pace of medical knowledge and an ever-evolving health care system, repeated sessions may be necessary to sustain changes in behavior. It is also recommended that each visit focus on a small number of important messages, rather than communicate too many complex ideas, as attempting to do so may fail to achieve retention of the most important points.\textsuperscript{16} In a study examining the effect of academic detailing as a method of implementing a clinical guideline in general practice, Witt et al. (2004) reported no effect of educational outreach visits and suggested that when visits are not followed by any other intervention, sustaining behavioral change is unlikely because there was nothing to remind physicians of the visit.\textsuperscript{26} While repetition is important, providing feedback of improved behavior with reinforcement can also promote effective academic detailing.\textsuperscript{30} For instance, when prescribers discuss their experiences with implementing recommended changes in prescribing behavior during follow-up visits, detailers can verbally encourage and applaud their successes as well as discuss problem cases and their resolutions.\textsuperscript{30} Other studies showed that a reinforcement visit would be necessary to maintain changes in behavior and perhaps to engage physicians not captured in the initial encounter.\textsuperscript{29,34} Data also supported a doubling in the reduction of inappropriate prescribing among physicians who received follow-up visits compared with those who received only 1 visit.\textsuperscript{35}

### Table 3

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Prescribers Who Were Educated About the DDIs of Interest&lt;sup&gt;a&lt;/sup&gt; DDIs Per 100 Precipitant Drug Claims Mean (95% CI)</th>
<th>Control Group DDIs Per 100 Precipitant Drug Claims Mean (95% CI)</th>
<th>Wilcoxon Rank Sum Score P Value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous interactions</td>
<td>0.0137 (0.0121, 0.0152)</td>
<td>0.0152 (0.0133, 0.0172)</td>
<td>0.024</td>
</tr>
<tr>
<td>Interactions involving anti-infective medications</td>
<td>0.0331 (0.0307, 0.0355)</td>
<td>0.0366 (0.0342, 0.0391)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Interactions involving monoamine oxidase inhibitors</td>
<td>0.0016 (0.0010, 0.0022)</td>
<td>0.0037 (0.0021, 0.0052)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Interactions involving anticoagulants</td>
<td>0.5667 (0.5570, 0.5764)</td>
<td>0.5073 (0.4964, 0.5181)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<sup>a</sup>One physician in the educational program group had no prescriptions during the baseline period and was excluded from the analysis. CI=confidence interval; DDI=drug-drug interaction.
TABLE 4 Poisson Regression Model Assessing the Relationship Between Number of DDIs in Follow-up, Prescriber Characteristics, and Intervention Status

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Rate Ratio</th>
<th>P Value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational program</td>
<td>1.042</td>
<td>&lt;0.001</td>
<td>1.033, 1.051</td>
</tr>
<tr>
<td>No educational program (reference)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DDIs-baseline</td>
<td>2.637</td>
<td>&lt;0.001</td>
<td>2.577, 2.699</td>
</tr>
<tr>
<td>Age</td>
<td>1.002</td>
<td>&lt;0.001</td>
<td>1.002, 1.002</td>
</tr>
<tr>
<td>Profession</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician assistant (reference)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dentist</td>
<td>2.123</td>
<td>0.199</td>
<td>0.673, 6.699</td>
</tr>
<tr>
<td>Medical doctor, doctor of osteopathic medicine</td>
<td>2.267</td>
<td>0.156</td>
<td>0.731, 7.033</td>
</tr>
<tr>
<td>Other</td>
<td>2.131</td>
<td>0.186</td>
<td>0.692, 6.685</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiology</td>
<td>(reference)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Emergency medicine</td>
<td>0.327</td>
<td>&lt;0.001</td>
<td>0.306, 0.350</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>0.263</td>
<td>&lt;0.001</td>
<td>0.249, 0.276</td>
</tr>
<tr>
<td>Family practice</td>
<td>0.338</td>
<td>&lt;0.001</td>
<td>0.333, 0.343</td>
</tr>
<tr>
<td>Geriatrics</td>
<td>0.423</td>
<td>&lt;0.001</td>
<td>0.385, 0.464</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>0.380</td>
<td>&lt;0.001</td>
<td>0.360, 0.402</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>0.452</td>
<td>&lt;0.001</td>
<td>0.446, 0.459</td>
</tr>
<tr>
<td>Obstetric/ gynecology</td>
<td>0.185</td>
<td>&lt;0.001</td>
<td>0.170, 0.202</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>0.281</td>
<td>&lt;0.001</td>
<td>0.260, 0.305</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>0.237</td>
<td>&lt;0.001</td>
<td>0.221, 0.255</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>0.479</td>
<td>&lt;0.001</td>
<td>0.457, 0.502</td>
</tr>
<tr>
<td>Other</td>
<td>0.430</td>
<td>&lt;0.001</td>
<td>0.422, 0.437</td>
</tr>
<tr>
<td>Geographic region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>1.050</td>
<td>&lt;0.001</td>
<td>1.028, 1.071</td>
</tr>
<tr>
<td>Southeast</td>
<td>1.062</td>
<td>&lt;0.001</td>
<td>1.042, 1.083</td>
</tr>
<tr>
<td>Central</td>
<td>1.064</td>
<td>&lt;0.001</td>
<td>1.043, 1.086</td>
</tr>
<tr>
<td>Midwest</td>
<td>1.238</td>
<td>&lt;0.001</td>
<td>1.207, 1.270</td>
</tr>
<tr>
<td>Southwest</td>
<td>0.946</td>
<td>&lt;0.001</td>
<td>0.926, 0.967</td>
</tr>
<tr>
<td>Rocky Mountain</td>
<td>1.406</td>
<td>&lt;0.001</td>
<td>1.365, 1.448</td>
</tr>
<tr>
<td>West</td>
<td>(reference)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

CI = confidence interval, DDI = drug-drug interaction.

Educational outreach interventions usually take place within an environment that includes multiple factors, each with the potential to influence prescribing patterns. Factors within the immediate work environment, or within the external environment, can have an important impact on the effectiveness of educational outreach interventions. One example is the computerized decision support systems. In a study evaluating the effectiveness of electronic medical record alerts for selected medications that interact with warfarin, Feldstein et al. (2006) found no significant improvement in the rate of prescribing potential DDIs as a result of academic detailing. The authors suggested that the absence of an additional intervention effect from the educational visits may not be especially surprising given the strength of the electronic medical record alerting intervention. Another example is the perception of physicians. For instance, if the information presented during the educational outreach visit is not new, or that physicians had other ways of obtaining the information, they may develop doubts about the independence and objectivity of the information. This, in turn, may limit the possibilities of detecting positive effects from educational outreach visits. External environmental factors can also impose an influence on prescribing patterns. Figueiras et al. (2001) reviewed 8 studies of educational programs designed to improve prescription practices in ambulatory care and concluded that in 7 of these studies the difference between pre- and postmeasurements may be due to the statistical law of regression of the mean and to other factors not related to educational outreach interventions. In addition, temporal variations of medication use might be affected by certain external variables, such as seasonal variations of disease frequency, marketing by pharmaceutical companies, safety issues, and regulatory policies.

Prescriber characteristics may play a role in the lack of effect of the educational outreach program. In this study, older prescribers were significantly more likely to prescribe potentially interacting medications (RR = 1.002, P < 0.001, 95% CI = 1.002-1.002), but this difference may not be clinically meaningful. Furthermore, specialty groups and geographic regions varied significantly across groups (Table 4). In particular, cardiologists were significantly more likely to prescribe potentially interacting medications when compared with other physician specialty groups, which might be attributed to the specific set of DDIs of interest used by the educational program. This finding was contrary to what was reported by Soumerai and Avorn (1987), who found no statistical differences in the mean program effect between older versus younger physicians and across various physician specialty groups. Other studies have also evaluated the effect of practice characteristics. Freemantle et al. (2002) found that practices with 2 or fewer practitioners showed a substantial reaction to the effect of educational outreach visits, whereas the effect in larger practices was modest and statistically nonsignificant. While the effect of practice characteristics was not examined in this study, it may be speculated that practitioners in larger practices may find it harder to influence change because of concerns regarding peer perceptions. Such influence may have had an impact on the results, thereby masking the effectiveness of the educational outreach visits. Therefore, it is recommended that future studies include prescriber characteristics and practice characteristics to assist in determining the effect of educational outreach visits on DDIs.

Lastly, detecting significant impact of educational outreach programs can also depend on the structure of the program as well as the design and content of the educational outreach materials. Offering practical alternatives to the target medications and minimizing the effect of the detailee’s personal style through standardizing the educational encounter can
groups was no longer significant. Interestingly, cardiologists were more likely to prescribe potentially interacting medications than physicians of other specialties, even when warfarin interactions were excluded from the analysis.

**Limitations**

There are several limitations to this study. A major limitation is its quasi-experimental design and the lack of random selection of prescribers for the educational outreach program. Cardiologists, who are more likely to prescribe anticoagulants, were over-represented in the intervention group. Also, the educational outreach intervention focused on the optimal management of potential anticoagulant-related DDIs, rather than outright discontinuation of medication. Despite the groups being matched with respect to prescribing volume, other differences with respect to demographic characteristics were noted. Furthermore, the educational program did not focus specifically on only those prescribers with a history of prescribing 1 or more of the interaction medications. Delivering a successful educational outreach program partially depends on the appropriateness of the target population, so selecting prescribers based on prescription volume and cost at baseline, instead of their prescribing patterns of potential DDIs, was probably not conducive to detecting a positive intervention effect. Contamination between study groups might have also been a potential reason for the lack of effect of educational outreach interventions. Contamination may occur when physicians from different intervention groups work closely and share information about the interaction. The study did not attempt to control for intervention and controls residing within the same practice setting. This expectedly may result in a reduction of the measured effectiveness of the intervention. Finally, the intervention may have been more effective if educational interventions occurred solely with prescribers who were involved in a potential interaction exposure and this information was included as a part of the intervention.

**Conclusion**

The current educational outreach intervention did not significantly alter potential DDI prescribing. There are numerous potential causes for the lack of effect, including selection bias as a result of prescriber targeting and matching criteria, type of intervention content, and absence of reinforcing messages or prescriber feedback.

Although clinical consultants have shown to be a novel and potentially effective method for delivering educational outreach content, future educational outreach efforts should incorporate reinforcement and feedback in the messaging and should tailor the content to the specific needs and relevance of prescribers.

---

**TABLE 5** Poisson Regression Model Assessing Relationship Between Number of DDIs and Prescriber Characteristics and Group Membership (with Warfarin Interactions Excluded)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Rate Ratio</th>
<th>P Value</th>
<th>93% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational program</td>
<td>1.013</td>
<td>0.122</td>
<td>0.997, 1.030</td>
</tr>
<tr>
<td>No educational program</td>
<td>(reference)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>1.002</td>
<td>&lt;0.001</td>
<td>1.002, 1.003</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency medicine</td>
<td>0.364</td>
<td>&lt;0.001</td>
<td>0.324, 0.409</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>0.359</td>
<td>&lt;0.001</td>
<td>0.332, 0.387</td>
</tr>
<tr>
<td>Family practice</td>
<td>0.358</td>
<td>&lt;0.001</td>
<td>0.346, 0.367</td>
</tr>
<tr>
<td>Geriatrics</td>
<td>0.382</td>
<td>&lt;0.001</td>
<td>0.316, 0.462</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>0.537</td>
<td>&lt;0.001</td>
<td>0.494, 0.584</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>0.437</td>
<td>&lt;0.001</td>
<td>0.426, 0.448</td>
</tr>
<tr>
<td>Obstetric/gynecology</td>
<td>0.303</td>
<td>&lt;0.001</td>
<td>0.271, 0.338</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>0.315</td>
<td>&lt;0.001</td>
<td>0.273, 0.364</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>0.401</td>
<td>&lt;0.001</td>
<td>0.366, 0.439</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>0.368</td>
<td>&lt;0.001</td>
<td>0.327, 0.413</td>
</tr>
<tr>
<td>Other</td>
<td>0.429</td>
<td>&lt;0.001</td>
<td>0.417, 0.442</td>
</tr>
<tr>
<td>Geographic region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>1.024</td>
<td>0.225</td>
<td>0.986, 1.064</td>
</tr>
<tr>
<td>Southeast</td>
<td>1.019</td>
<td>0.303</td>
<td>0.983, 1.057</td>
</tr>
<tr>
<td>Central</td>
<td>1.012</td>
<td>0.351</td>
<td>0.974, 1.051</td>
</tr>
<tr>
<td>Midwest</td>
<td>1.001</td>
<td>0.978</td>
<td>0.976, 1.051</td>
</tr>
<tr>
<td>Southwest</td>
<td>0.948</td>
<td>0.008</td>
<td>0.912, 0.986</td>
</tr>
<tr>
<td>Rocky Mountain</td>
<td>1.218</td>
<td>&lt;0.001</td>
<td>1.148, 1.292</td>
</tr>
<tr>
<td>West</td>
<td>(reference)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CI = confidence interval; DDI = drug-drug interaction.

---

In this study, the majority of DDIs were attributed to warfarin and other anticoagulants, a finding that is consistent with other studies of DDIs. To further investigate whether the disproportionate representation of warfarin interactions might be associated with biased estimates, a multivariate analysis was performed with and without warfarin interactions (Tables 4 and 5). The results from the analyses were different; prescribers in the intervention group were significantly more likely to prescribe potentially interacting medications than the control group, when warfarin interactions (specifically with NSAIDs) were included. However, when those interactions were removed, the difference in prescribing behavior between the intervention and control...
Authors

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DISCLOSURES

This study was funded by the Agency for Healthcare Research and Quality (Grant No. U18 HS10385-05). The Agency for Healthcare Research and Quality played no role in the design of the study nor in the collection, analysis, or interpretation of the data. The decision to submit the manuscript for publication was solely the decision of the authors.

At the time of this study, Liberman was an employee of CVS/Caremark. The other authors declare no conflict of interest.

Concept and design and data collection were performed by Malone and Liberman. Malone interpreted the data and wrote the manuscript. Sun assisted in writing the manuscript. Critical revision was provided by Malone, Liberman, and Sun.

REFERENCES

Effect of an Educational Outreach Program on Prescribing Potential Drug-Drug Interactions


Impact of a Combined Pharmacist and Social Worker Program to Reduce Hospital Readmissions

Monika Gil, PharmD, BCPS; Dana K. Mikaitis, MS; Gayle Shier, MSW; Tricia J. Johnson, PhD; and Shannon Sims, MD, PhD

ABSTRACT

BACKGROUND: The Patient Protection and Affordable Care Act (2010) directed the Centers for Medicare and Medicaid Services to implement a hospital readmissions reduction program that reduces payments to hospitals for excess readmissions that began in October 2012. As such, hospitals across the country have been trying to identify and implement successful strategies for reducing hospitalizations.

OBJECTIVE: To evaluate the impact of a combined pharmacist and social worker program on reducing 30-day, all-cause readmission rates to the same hospital.

METHODS: Our study design was a retrospective, cross-sectional study that included 100 inpatients discharged from a large academic medical center. Fifty patients were enrolled in the combined pharmacist and social worker program, and 50 received usual care; all were deemed high risk for readmission due to clinical or social factors. In the program group, a pharmacist performed a thorough medication history and review of discharge medications and, in some cases, communicated with the patient after discharge. The program group was also followed by a social worker team in the hospital and after discharge; as necessary, psychosocial interventions were performed.

RESULTS: The 2 patient cohorts had similar demographic and clinical characteristics. Ten percent of patients enrolled in the combined pharmacist and social worker program were readmitted to the hospital for any reason within 30 days of discharge, compared with 30% of patients in the usual care group (P=0.012).

CONCLUSION: The combined pharmacist and social worker program demonstrated a significant reduction in 30-day, all-cause readmission rates to the same hospital.

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What this study adds

- This study was the first to evaluate a model that combines both a social worker and pharmacist in order to reduce hospital readmissions.
- From the evidence, it is apparent that multiple types of interventions and communication modalities can be successful in improving care transitions.

The U.S. health care system often fails to meet the needs of patients discharged from hospital to home. Traditionally, interaction with the patient ends once the patient is discharged from the hospital. As a result, patients are often unprepared for their self-management role in the next care setting. The period of time following hospital discharge is an especially fragile one in which patients can experience a number of adverse events that may lead to rehospitalization. For this reason, in its June 2007 report to Congress, the Medicare Payment Advisory Commission stated that hospital readmissions can be indicators of poor care or missed opportunities to better coordinate care.

In addition to adversely affecting patients’ health, the failure to coordinate care at this critical juncture results in additional Medicare spending. In 2005, 17.6% of Medicare admissions resulted in hospital readmissions within 30 days of discharge, accounting for $15 billion in spending. These costs have garnered attention from policymakers, who view reducing readmissions as a way to improve quality and reduce costs. The Patient Protection and Affordable Care Act passed in 2010 directed the Centers for Medicare and Medicaid Services to implement a hospital readmissions reduction program to reduce payments to hospitals that have excess readmissions for selected conditions, beginning in October 2012.

Almost one-fifth of Medicare beneficiaries discharged from the hospital are rehospitalized within 30 days. Patients are readmitted for numerous reasons, including psychosocial issues and medications. Psychosocial issues such as limited health literacy, lack of self-management skills, unmet functional needs, lack of social support, and living alone have all been associated with adverse health outcomes including readmission and mortality. Proctor et al. (2000) reported that 40%-50% of hospital readmissions for older adults are “linked to social problems and lack of community services.”

What is already known about this subject

- The period of time following hospital discharge is an especially fragile one in which patients can experience a number of adverse events that may lead to rehospitalization.
- Psychosocial issues and medication-related adverse events are well-documented sources of hospital admissions and readmissions.
- Several models of care coordination utilizing different types of clinicians, including pharmacists and social workers, have proven to reduce readmissions or improve other aspects of care following hospital discharge via various communication methods.
Impact of a Combined Pharmacist and Social Worker Program to Reduce Hospital Readmissions

Medication-related harm is another well-documented source of hospital admission and readmission. Approximately 20% of patients discharged from the hospital to home experience postdischarge adverse events, nearly two-thirds of which are medication-related. Beijer and de Blaey (2002) reported that 88% of adverse drug-related hospitalizations in the elderly are avoidable. The Beers criteria, recently updated by The American Geriatrics Society, provides a comprehensive guide that identifies potentially inappropriate medications in older adults. This tool includes rationale for avoidance of specific medications and recommendations to help prevent adverse drug events and potential hospitalization. Medication risks for readmission include use of high-risk medications such as anticoagulants or opioids, difficulty obtaining medications, and inadequate medication reconciliation.

In an effort to reduce hospital readmissions, several models of care coordination have been proven to reduce readmissions or improve other aspects of care following hospital discharge. A single health care network demonstrated that pharmacist involvement decreased readmissions by up to 30%, Bellone et al. (2012) showed a statistically significant difference in the rate of readmission for patients who had received a pharmacist visit postdischarge versus those who had not at 18% and +3.1% (P=0.002), respectively. Another study showed fewer returns to the emergency room after pharmacist telephonic interventions. Successful intervention models have utilized different types of clinicians or teams of clinicians, including pharmacists and social workers. They also have used different communication methods, either communicating with the patient in person or using the telephone. From this evidence, it is apparent that multiple types of interventions and communication modalities can be successful at improving care transitions. While some models have used advanced practice nurses to facilitate discharge planning and home follow-up with patients after discharge, others have deployed advanced practice nurses as “transition coaches” to support patients and caregivers taking a more active role during care transitions.

To date, however, no research has tested whether a model that combines social worker and pharmacist coordination is more effective in reducing hospital readmissions, compared with models that use either social workers or pharmacists alone to coordinate care.

Rush University Medical Center (RUMC) has developed a model of care coordination, called the Enhanced Discharge Planning Program (EDPP) and is known nationally as Bridge, which utilizes masters-trained social workers as the primary intervention staff. The social workers follow the course of inpatient care and call patients within days of discharge from the hospital to assess and intervene on a wide range of psychosocial issues. Although social worker-mediated interventions have been shown to decrease 30-day readmission rates, the RUMC EDPP model has not shown a statistically significant decrease in 30-day readmissions. Clearly, psychosocial factors are an important aspect of care coordination, but the literature demonstrates that other clinical factors, particularly medication-related risk, are also important causes of rehospitalization.

To address both medication and psychosocial risks, and fill an important gap in current literature, we developed a multidisciplinary program model that includes both pharmacists and social workers. This study builds on the RUMC EDPP model by adding a clinical pharmacist component to the care coordination program. The goal of this study was to determine if a combined pharmacist and social worker program reduced 30-day, all-cause readmissions to the same hospital.

Methods

This study was conducted at RUMC, a 671-bed academic medical center in Chicago and was approved by the Institutional Review Board. Our study design was a retrospective, cross-sectional study that compared same hospital readmission within 30 days of discharge for patients enrolled in the combined pharmacist and social worker program with those receiving usual care. Both the program and control groups were drawn from inpatient discharges from March 2011 to November 2011. The program cohort comprised 50 patients discharged from 1 general medical-surgical nursing unit, while the usual care group 50 patients discharged from a separate, but similar, general medical-surgical nursing unit at RUMC. Both groups received the same standard usual discharge care coordination. Additionally, the program group received an enhanced multidisciplinary care approach that also included the focused involvement of the pharmacist and social worker. Our study was limited to English-speaking patients aged greater than 18 who were discharged to home or home with home health services. Patients with solid organ transplant, end-stage renal disease, or with active chemotherapy or radiation therapy were excluded from the study. Inclusion in the program group also required patients to have 1 or more characteristics that put them at high risk of readmission. We grouped our risk factors into 3 categories: use of high-risk medications, psychosocial risk factors, and other clinical risk factors (Table 1).

Our usual care group was drawn from a different medical-surgical patient care unit. A one-to-one matching algorithm was used to match each patient enrolled in the combined pharmacist and social worker program with 1 patient on the control group medical-surgical unit based upon age, gender, length of stay, primary payer, and the presence of at least 1 of the same risk factors for readmission. Patients were matched on the following characteristics: age ± 2 years; length of hospital stay ± 2 days; primary payer (Medicare, Medicaid, self-pay, charity care, commercial); and the presence of at least 1 risk.
factor (high-risk medications, such as anticoagulation therapy, digoxin, or opioids; a clinical risk factor, such as depression, fall risk, limited functional capacity, substance abuse; or a psychosocial risk factor, such as limited health literacy, cost, or insurance issue).

Both groups received the RUMC standard care discharge procedure, which included the admission medication history reconciliation generally completed by the physician or the nurse, the discharge plan developed by the primary clinical team (includes the attending and resident physicians), discharge instructions, and the discharge education most often provided by the physician or nurse. A multidisciplinary team that includes a pharmacist and a social worker as well as a post-discharge follow-up telephone call is not the standard practice at RUMC; consequently, the usual care group did not receive these components.

Patients enrolled in the program group received 4 additional care components that were not offered to the patients in the usual care group. First, an inpatient interdisciplinary care coordination team performed daily rounds on the patient during each hospitalization. The goal of these rounds was to ensure that the patient was prepared for discharge; however, the care coordination team was not the primary care team for the patient. Care coordination team members included an attending physician, clinical pharmacist, bedside nurse, case manager, and an EDPP social worker. The pharmacist and social worker were primary clinicians responsible for care transition interventions and were the only members of the team to follow-up with the patient in the outpatient setting. Second, a pharmacist completed a detailed medication history of home medications, assessed medication-related risks, and provided relevant education during the hospitalization. Third, shortly after discharge, the pharmacist completed a discharge medication profile review to ensure that the discharge medications were appropriate for the care plan. The pharmacist was also available via telephone to answer any medication-related questions that the patient had after discharge. Fourth, after the patient was discharged from RUMC, an EDPP social worker, who was an outpatient-based licensed clinical social worker unaffiliated with inpatient case management, contacted the patient within 2 business days and conducted a telephonic assessment to identify any potential psychosocial risks for readmission. When issues were identified, the appropriate medical providers and community-based agencies were engaged to address the issue.

The primary data sources were the electronic medical record and an affiliated clinical data warehouse, which were used to derive all study data and variables of interest. Our primary outcome variable was readmission back to RUMC within 30 days of discharge for any reason. A number of patient characteristics were included in the analysis, including age at discharge; gender; race; primary payer (i.e., commercial, Medicare, Medicaid or self-pay/charity); and length of stay. The electronic medical record and patient interviews were used to determine whether patients presented with 1 or more of the risk factors described in Table 1. The program pharmacist used a structured data instrument to collect information about interventions performed and time spent. Additional data were collected by the social workers postdischarge that categorized psychosocial problems identified and interventions performed (Table 2).

### Table 1: Inclusion Criteria for the Program Group (At Least 1 of the Following)

<table>
<thead>
<tr>
<th>Risk Factor Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use of high-risk medications</td>
</tr>
<tr>
<td>- Anticoagulation therapy</td>
</tr>
<tr>
<td>- Concurrent aspirin and clopidogrel therapy</td>
</tr>
<tr>
<td>- Anticholinergic agent</td>
</tr>
<tr>
<td>- Digoxin</td>
</tr>
<tr>
<td>- Opioids</td>
</tr>
<tr>
<td>- Psychotropic medications</td>
</tr>
<tr>
<td>- Erythrocyte stimulating factor</td>
</tr>
<tr>
<td>2. Other clinical risk factors</td>
</tr>
<tr>
<td>- Depression</td>
</tr>
<tr>
<td>- Fall risk</td>
</tr>
<tr>
<td>- Limited functional capacity</td>
</tr>
<tr>
<td>- Substance abuse</td>
</tr>
<tr>
<td>- Dementia</td>
</tr>
<tr>
<td>3. Psychosocial risk factors</td>
</tr>
<tr>
<td>- High caregiver burden</td>
</tr>
<tr>
<td>- Family conflict</td>
</tr>
<tr>
<td>- Limited health literacy</td>
</tr>
<tr>
<td>- Lives alone</td>
</tr>
<tr>
<td>- Significant patient stress</td>
</tr>
<tr>
<td>- Transportation concerns</td>
</tr>
<tr>
<td>- Health care scheduling concerns</td>
</tr>
<tr>
<td>- Inadequate emotional support</td>
</tr>
</tbody>
</table>

### Table 2: Questions Employed by EDPP Social Workers to Determine Psychosocial Risk Factors for Hospital Readmission

<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are the patient’s and caregiver’s experiences at home?</td>
</tr>
<tr>
<td>- How do the patient and/or caregiver perceive the situation?</td>
</tr>
<tr>
<td>- Is the situation stable?</td>
</tr>
<tr>
<td>2. Are the patient and caregiver able to follow-up with medical care?</td>
</tr>
<tr>
<td>- Do they have a copy of the discharge instructions?</td>
</tr>
<tr>
<td>- Have they filled their prescriptions? Do they have any questions about their medications?</td>
</tr>
<tr>
<td>3. Are the patient and caregiver receiving appropriate formal and informal support?</td>
</tr>
<tr>
<td>- Do they have a family member or friend who can help?</td>
</tr>
<tr>
<td>- Do they belong to a faith community or social group that can help?</td>
</tr>
<tr>
<td>4. Are there any other issues?</td>
</tr>
<tr>
<td>- What is the status of any outstanding issues identified during the pre-assessment?</td>
</tr>
<tr>
<td>- Did any of their contact information change?</td>
</tr>
</tbody>
</table>

EDPP = Enhanced Discharge Planning Program.
Data were analyzed using SPSS Version 18.0 (SPSS Inc., Chicago, IL). Means and standard deviations were used to describe continuous variables, and frequencies were used to describe discrete variables. A chi-square test was performed to test for a difference in the proportion of patients readmitted within 30 days, between the program and usual care group. A binary logistic regression model was fit to test the association between readmission and the intervention group, controlling for patient characteristics. A P value of 0.05 was used for all tests of statistical significance.

## Results

Of the 100 patients included in this analysis, the mean age of the sample was 56.5 ± 16.6 years. Fifty-eight percent of the patients were African American; 29% were White; and 13% were “Other race/ethnicity.” The mean length of stay was 3.3 ± 4.3 days. In total, 20% of patients in this study were readmitted to RUMC within 30 days of discharge.

All patients enrolled in the program group received a medication history, which took the pharmacist an average of 22 minutes to complete. Eighty percent of patients in the program group also had a medication reconciliation completed by the pharmacist while hospitalized, which took an average of 15 minutes to complete. All patients enrolled in the program had their lists of discharge medications reviewed by the pharmacist after discharge. Thirty percent of patients in the program group were called by the pharmacist after discharge to address a post-discharge medication issue. Post-discharge communication was initiated in response to issues identified during the discharge medication profile review or at the request of an EDPP social worker who identified a concern during the telephonic assessment. Table 3 presents a list of risk factors identified by the pharmacist during admission.

EDPP social workers contacted 98% of the patients enrolled in the program within 2 business days of hospital discharge to identify and intervene in any potential risk factors for readmission. The average duration of the intervention was 3 days (i.e., the difference between the first call and the last communication). During this time period, the EDPP social worker placed an average of 4.6 calls to stakeholders in the care plan, including the patient, the informal caregiver, home health, community service providers, and the patient’s physicians. Table 4 describes the types of issues most commonly identified by the EDPP social worker.

Enrollment in the program was associated with a lower rate of 30-day, all-cause readmission compared with the control group. Out of the 50 patients enrolled in the combined pharmacist and social worker program, 10% were readmitted back to RUMC within 30 days of discharge, compared with 30% of the 50 patients in the usual care group (Table 5); this finding was statistically significant (P = 0.012).

After controlling for age, gender, length of stay, payer, and race, program enrollment decreased the odds of readmission. Patients in the control group had an odds ratio (OR) of 4.615 (P = 0.014) for 30-day, all-cause readmission to RUMC.

## Discussion

Readmission rates were significantly lower for patients enrolled in the combined pharmacist and social worker program. We found that 10% of the patients enrolled in the program were readmitted back to RUMC within 30 days of discharge for any reason, compared with 30% of the patients in the usual care group (P = 0.012). Further, after controlling for a number of variables, including age, gender, length of stay, payer, and race, patients receiving usual care were almost 5 times as likely to be readmitted to RUMC within 30 days of discharge, compared with patients enrolled in the program group (P = 0.014, OR = 4.615).

Our program expanded the scope of the existing RUMC EDPP, a social worker-mediated intervention, to include a medication management program led by a clinical pharmacist. By developing this multidisciplinary approach, we sought to address a wider range of clinical and psychosocial issues that can arise at discharge. A key aspect of our program was targeting high-risk patients, including those taking high-risk medications. We believe that our program was successful because we identified risk factors that our intervention team was equipped to address. For example, the pharmacist was able...
to identify and address issues such as unintended duplicate opioid therapy, and the EDPP social worker helped address issues such as difficulty obtaining prescribed medicines. Our results suggest that targeting high-risk patients and designing a program to ameliorate those risks can be a successful model for reducing readmissions. It may also be a more financially sustainable model, since expending resources on low-risk patients may not be clinically or economically efficient.

Our findings underscore the importance of medication management as a strategy for reducing 30-day hospital readmissions. Clinical pharmacists are key members of care teams to both identify and address medication-related issues that can lead to rehospitalization. While at least 1 social worker-led intervention reduced readmission rates,20 RUMC’s EDPP did not demonstrate this effect. Our results, therefore, suggest that using both a pharmacist and social worker together to evaluate and address postdischarge needs is an effective strategy to reduce hospital readmissions.

The results of our study are consistent with the findings of other transition programs that evaluated the impact of a care coordination program on reducing 30-day readmissions. The Project RED program, which deploys nurse discharge advocates and clinical pharmacists, decreased hospital utilization (combined emergency department visits and readmissions) within 30 days of discharge by about 30%.13 Coleman’s Care Transitions program significantly reduces 30-day readmissions by pairing patients with a transition coach to educate patients.14 Our program model represents another approach to improving transitions and reducing 30-day readmissions.

**Limitations**

Some limitations of this study included sample size and study design. Our sample size was relatively small, and our study was not a randomized trial. Our control group was created by retrospectively matching a cohort of patients from a similar nursing care unit as the program group rather than prospective enrollment in the control group. Our study was also limited to readmissions to our own institution, which may underestimate the true rate of readmission to any hospital. Finally, the results from our urban academic medical center may not be applicable to other care settings. Despite this study’s limitations, our results are promising.

A randomized controlled trial (RCT) involving a larger cohort size would be beneficial to confirm our findings. Conducting a multisite RCT would be ideal to ensure generalizability of this program to different types of hospitals and geographic settings. In addition, future analysis could examine the economic efficiency of the program compared with usual care at discharge. Successful programs interventions must not only achieve reduced readmissions, but must also be financially sustainable to the sponsoring institution.

**Conclusion**

A multidisciplinary approach consisting of a pharmacist-led medication management program and a social worker-led program to address psychosocial factors demonstrated a significant reduction in 30-day, all-cause readmission rates to the same hospital. The multidisciplinary program had a high face validity among clinicians, since it addressed medication issues, a common source of hospital admission, and psycho-social issues, which patients face after discharge. Our targeted approach to identifying high-risk patients may offer a sustainable, potentially cost-effective approach to reducing 30-day readmissions.

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DISCLOSURES

This study received support through a grant from the Cardinal Health Foundation.

Study concept and design were contributed by Sims, Shier, and Gil. Data were collected by Gil, Shier, Mikaitis, and Sims and interpreted by all the authors. The manuscript was written primarily by Mikaitis with assistance from Gil, Shier, Johnson, and Sims and was revised by Shier, Johnson, Sims, and Gil, with assistance from Mikaitis.

REFERENCES

Attitudes of Medicare-Eligible Americans Toward Mail Service Pharmacy

Michael T. Rupp, PhD, BPharm, FAPhA

ABSTRACT

BACKGROUND: For many years, community pharmacies provided mail delivery as a convenience for a small segment of special circumstance patients who requested it. Fueled by a movement among plan sponsors and prescription benefit managers to encourage or require its use, growth in mail service pharmacy began to accelerate in the 1980s and now accounts for nearly 25% of the market in the general population and a much higher percentage of seniors.

OBJECTIVE: To assess the attitudes of Medicare-eligible Americans toward concerns that have been raised about mail service pharmacy and its mandated use in the prescription benefit plans of public and private insurance programs.

METHODS: Existing published literature was reviewed, and interviews were conducted with Medicare-eligible persons aged 65 and older to identify potential areas of concern with mail order pharmacy services. A survey was constructed and mailed to a nationally representative random sample of 6,500 persons between the ages of 65 and 79 in July 2012.

RESULTS: By the cutoff date, 669 completed surveys had been received, and an additional 221 had been returned as undeliverable, resulting in an overall response rate of 10.7%. Nearly half of respondents listed chain pharmacy as their primary source of prescription medications (47.7%) followed by mail service (34.1%), independent pharmacy (13.1%), and other (5.1%). Responses of seniors residing in rural ZIP codes compared with those in nonrural ZIP codes demonstrated significantly higher agreement with several concerns, including lost or stolen medications, receiving the exact medication the physician prescribed, and the effects of exposure to heat, cold, or moisture. Two additional concerns approached statistical significance: the ability to speak with a pharmacist face-to-face and the ability to obtain medications quickly if needed. A total of 533 (83.7%) indicated they would oppose mandated mail order in their current benefit plan if it would cause the local community pharmacy they rely on for immediate medication needs to close. The mean risk of such an eventuality that respondents were willing to accept was 42.2%, indicating they would oppose mandatory mail order if there were greater than about a 4-in-10 chance it would cause the loss of their local pharmacy.

CONCLUSIONS: Seniors appear to be practical and pragmatic about the sources of their prescription medications. While most see a role for mail service pharmacy, they are also aware of its limitations. Many have needs they believe cannot be adequately met by mail service or have relationships with local pharmacies and pharmacists they believe are important for maintaining their health and well-being. As a result, seniors are relatively risk averse when it comes to the loss of their local community pharmacy, even if they routinely use mail order for most of their medications. Beyond their specific concerns, most seniors oppose any restrictions on their freedom to use the pharmacy of their choice on general principle.

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What is already known about this subject

• From 6% of the U.S. prescription drug market in the late 1980s, mail order now accounts for 23.5% and has significantly higher use in the senior population.
• More than 97% of employers report offering a mail order option to employees, and 23% require the use of mail order for maintenance prescriptions.
• Research has challenged the cost advantages of mail order to plan sponsors and concerns have been raised about the implications of mandating mail order in prescription benefit plans.

What this study adds

• Many seniors believe they have needs that cannot be adequately met by mail service or have relationships with local pharmacies and pharmacists they believe are important for maintaining their health and well-being.
• Seniors living in rural ZIP codes have significantly greater concerns than those in nonrural ZIP codes about the potential for lost or stolen medications, receiving the exact medication the physician prescribed, and the effects of exposure to heat, cold, or moisture on prescription medications.
• Beyond specific concerns that some seniors have about mail service pharmacy, most appear to oppose any restrictions on their freedom to use the pharmacy of their choice on general principle.
• Even among those who use and are generally satisfied with mail service pharmacy, seniors are relatively risk averse when it comes to the loss of their local community pharmacy.

For many years, community pharmacies have delivered prescription medications to the homes of selected patients via U.S. mail or courier services. Mail delivery was traditionally provided as a convenience to a small segment of special circumstance patients who requested it for reasons such as mobility impairment, rural or remote location, illness, or temporary relocation.

Beginning in the 1980s, the growth in mail service pharmacy began to accelerate. From approximately 6% of the U.S. outpatient prescription drug market in the late 1980s, the mail order market share doubled to 12% in 2000. By 2010, its market share had doubled again to 23.5% in the general population,
and the proportion of seniors (aged 65 and older) who use mail order is reported to be significantly higher.\textsuperscript{2,3}

The growth in mail service has been fueled by a movement among health insurance benefit plan sponsors and prescription benefit managers to encourage or require the use of mail service pharmacy among covered beneficiaries.\textsuperscript{4} In a 2010 survey of 62 employer members of the National Business Group on Health, 47\% reported the use of mandatory mail order for maintenance medications.\textsuperscript{5} A 2012 survey of 424 employers by the Pharmacy Benefit Management Institute reported that 97.6\% offer a mail service pharmacy option to employees, and 23\% required maintenance medications to be dispensed by mail order, up from only 18\% the year before.\textsuperscript{6}

The rapid adoption of mail order by employers has occurred despite concerns that have been raised about its ability to control costs to plan sponsors. An analysis by Carroll et al. (2005) concluded that mail service pharmacy was less expensive for the patient but more expensive for the health plan.\textsuperscript{7} A subsequent study by Johnsrud et al. (2007) confirmed this finding, concluding that although consumers netted an overall savings benefit from mail order, this benefit did not extend to plan sponsors.\textsuperscript{8} In a study of military beneficiaries age 65 and older, Linton et al. (2007) found many elected not to use the mail order program despite the financial incentive to do so, choosing instead to use a community pharmacy.\textsuperscript{9}

A 2011 study found that 31.8\% of commercially insured patients who were previously required to use mail service pharmacy elected to have their prescriptions filled at community pharmacies when they were allowed to purchase 90-day supplies with no difference in out-of-pocket costs. Among those who had previously used a community pharmacy, the preference rate jumped to 66.3\%. The authors concluded that “when pharmacy benefit design does not preferentially support one pharmacy distribution channel, both community pharmacy and mail service pharmacy appeal to patients.”\textsuperscript{10}

The specter of mandatory mail order has raised numerous concerns among patients, employers, community pharmacists, and policymakers. The 2012 U.S. Pharmacy Survey by J.D. Power and Associates found that “satisfaction among customers who use mail order pharmacies to fill their prescriptions has fallen significantly below customer satisfaction with brick and mortar pharmacies,” and that patient satisfaction with mail order declined for the second consecutive year.\textsuperscript{11}

Beyond continuing questions about the purported cost advantages of mail order and the broad philosophical issue of the consumer’s freedom to choose pharmacy providers, specific concerns have been raised about a variety of other considerations, including safety, security, convenience, confidentiality, product integrity, and waste of mail service pharmacy. Although mostly anecdotal, these concerns continue to represent unanswered questions about how consumers view the consequences of current or future mandatory mail order provisions of prescription drug benefit programs.

The objective of this study was to empirically assess the attitudes of Medicare-eligible Americans toward mail service pharmacy and its mandated use in prescription drug benefit plans of public and private insurance programs. Of particular interest were consumers’ attitudes toward frequently cited concerns of mail order pharmacy, including the following:

- Cost of mail order to the plan sponsor, especially when considering waste
- Convenience of mail order when considering timeliness of delivery
- Reliability of uninterrupted therapy
- Substitution of medications for those originally prescribed by their physician
- Medication storage relative to environmental conditions such as heat, cold, and humidity
- Medication security
- Medication confidentiality
- Accessibility to a pharmacist for questions or counsel
- Safe disposal of excess or discontinued medications
- Continued economic viability of local community pharmacies for acute or urgent needs

\section*{Methods}

The survey included a series of descriptive demographic questions regarding gender, age, residential ZIP code, and drive time to the nearest community pharmacy. Additional questions asked about past experience with mail service pharmacy and whether the respondent was currently enrolled in Medicare.

Attitudes toward concerns that have been raised about mail service pharmacy were measured via a series of statements that required respondents to select a response from a 5-point Likert-type scale. The survey also asked whether the respondent would oppose a mandated mail order requirement in their prescription benefit plan if it would cause the local pharmacy they relied on for immediate medication needs to close.

This question was included on the survey because it has been suggested that the loss of maintenance medications to mail order could threaten the continued financial viability of some community pharmacies. To be clear, this scenario continues to be largely speculative, as empirical evidence that mail order pharmacy has driven community pharmacies out of business is lacking in the published literature. The purpose of this question was not to evaluate the validity of mail order’s purported threat to the financial viability of community pharmacies, but rather to assess how risk averse senior Americans are to losing their local community pharmacy providers in such an eventuality.
Those who indicated they would oppose mandated mail order in such a circumstance were subsequently asked to indicate the highest level of risk they would be willing to accept by circling the appropriate value on the following visual analog scale:

I would oppose mandated mail order if the risk that it would cause my local pharmacy to close were any higher than (circle the appropriate value below)

[----] [----] [----] [----] [----] [----] [----] [----] [----] [----]
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

The survey concluded with 2 open-ended questions that allowed respondents to express how the closure of their local community pharmacy would affect their lives, as well as any additional comments or concerns they had related to mail service pharmacy.

A pilot survey was mailed to 500 persons from a nationally representative random sample of 6,500 persons between the ages of 65 and 79 in July 2012. The mailing list was obtained from USA Data (http://usadata.com). The study sample was proportionately representative of the relative population of each of the 50 states. Also enclosed were a cover letter and a stamped return envelope. Forty-eight usable responses were returned for a response rate of 9.9%, as 13 surveys were eventually returned as undeliverable.

Following analysis of responses from the pilot, 1 question was added to the survey: “If you use a mail order pharmacy, how often do you speak with a mail order pharmacist about your medications?”

In August 2012, surveys were mailed to the remaining 6,000 persons on the mailing list. Once again, each envelope contained the survey, a cover letter, and a stamped return envelope.

## Results

By the cutoff date of October 15, 2012, 669 completed surveys had been returned. Of the 6,500 surveys mailed, 221 (3.4%) were eventually returned as undeliverable, resulting in an overall response rate of 10.7%, of which 57.0% were female and 43.0% were male.

The average age of survey respondents was 72.4 years (median = 72, standard deviation [SD] = 4.4). Although a range of 65-79 years was used as a selection criterion in generating the mailing list that was used in the study, 28 respondents reported being over 79 years of age. As these met the minimum age criterion, they were retained for analysis. The 669 respondents resided in 644 ZIP codes in 43 states. No surveys were returned from Alaska, Maine, Massachusetts, New Hampshire, North Dakota, Rhode Island, and Vermont.

Response rates by region indicated there were no significant differences (P < 0.05) between the survey sample and respondents according to the geographic classification system that is used by the U.S. Census Bureau.

### Table 1: Attitudes Toward Mail Service Pharmacy

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>N</th>
<th>% Strongly Agree</th>
<th>% Agree</th>
<th>% Neutral</th>
<th>% Disagree</th>
<th>% Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Getting prescriptions by mail is less expensive than getting them filled at a local pharmacy.</td>
<td>632</td>
<td>19.5</td>
<td>32.1</td>
<td>31.2</td>
<td>9.2</td>
<td>8.1</td>
</tr>
<tr>
<td>2. If I used a mail order pharmacy I would be concerned about running out of my medications.</td>
<td>655</td>
<td>16.9</td>
<td>24.1</td>
<td>19.1</td>
<td>25.5</td>
<td>14.4</td>
</tr>
<tr>
<td>3. If I used a mail order pharmacy I would be concerned about whether I fully understood my medications and how to take them.</td>
<td>654</td>
<td>12.1</td>
<td>16.1</td>
<td>20.8</td>
<td>35.0</td>
<td>16.1</td>
</tr>
<tr>
<td>4. If I used a mail order pharmacy I would be concerned that I could not talk face-to-face with a pharmacist.</td>
<td>658</td>
<td>19.3</td>
<td>21.9</td>
<td>20.4</td>
<td>26.1</td>
<td>12.3</td>
</tr>
<tr>
<td>5. If I used a mail order pharmacy I would be concerned that my medications could be lost or stolen.</td>
<td>656</td>
<td>17.1</td>
<td>23.0</td>
<td>17.8</td>
<td>31.1</td>
<td>11.0</td>
</tr>
<tr>
<td>6. If I used a mail order pharmacy I would be concerned about whether I was getting the exact medication my doctor ordered.</td>
<td>657</td>
<td>15.7</td>
<td>19.2</td>
<td>19.2</td>
<td>31.8</td>
<td>14.2</td>
</tr>
<tr>
<td>7. If I used a mail order pharmacy I would be concerned about the effects of excessive heat, cold, or moisture on my medications.</td>
<td>660</td>
<td>17.9</td>
<td>23.9</td>
<td>21.2</td>
<td>26.5</td>
<td>10.5</td>
</tr>
<tr>
<td>8. If I used a mail order pharmacy I would be concerned about waste when my medications are changed or discontinued.</td>
<td>657</td>
<td>15.5</td>
<td>25.4</td>
<td>26.2</td>
<td>25.4</td>
<td>7.5</td>
</tr>
<tr>
<td>9. If I used a mail order pharmacy I would be concerned about getting my medications quickly when I need them right away.</td>
<td>657</td>
<td>25.9</td>
<td>33.9</td>
<td>13.9</td>
<td>19.2</td>
<td>7.2</td>
</tr>
<tr>
<td>10. If I were required to use a mail order pharmacy I would be concerned about losing my freedom to use the pharmacy of my choice.</td>
<td>661</td>
<td>34.6</td>
<td>28.3</td>
<td>13.0</td>
<td>17.1</td>
<td>7.0</td>
</tr>
<tr>
<td>11. If I were required to use a mail order pharmacy I would be concerned about not having a pharmacist who knows me and the medications I take.</td>
<td>662</td>
<td>29.9</td>
<td>25.4</td>
<td>17.8</td>
<td>19.9</td>
<td>6.9</td>
</tr>
</tbody>
</table>
When asked to describe their health status, 56.1% of respondents indicated “Good” followed by “Fair” (22.8%), “Excellent” (17.8%), and “Poor” (3.3%). Most (98.1%) respondents indicated they were currently enrolled in Medicare.

Respondents reported taking an average of 4.6 different prescription medications each day that had been prescribed by an average of 1.6 physicians. The mean drive time to the nearest pharmacy was reported to be 9.1 minutes. Drive time was used because it is considered to be a more relevant indicator of access than geographic distance.

Almost half (47.7%) of respondents listed chain pharmacy as their primary source of prescription medications, followed by mail service (34.1%), independent pharmacy (13.1%), and other (5.1%). Most respondents who selected “other” specified their primary source of prescription drugs as the Veterans Health Administration (VA). Slightly more than one-third of respondents (34.2%) indicated they rely on an independent community pharmacy for at least some of their prescription medication needs.

When asked if they are currently required to use mail order for some of their medications, 12.3% indicated affirmatively, while 56.7% have used mail order for prescriptions in the past. Among those who currently use either voluntary or mandatory mail order, respondents indicated they speak to a mail order pharmacist 2.1 times per year on average.

**Attitudes Toward Mail Service Pharmacy**

The survey contained 11 statements designed to assess respondents’ attitudes toward specific concerns that have been raised about mail order pharmacy. Respondents indicated their agreement with each statement by selecting the response from a 5-point Likert-type scale that best reflected their opinion: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.

Scale reliability was assessed by calculating Cronbach’s coefficient alpha, a commonly used measure of internal consistency that varies from 0 to 1. An alpha value ≥0.7 is generally considered acceptable and a value ≥0.9 is considered excellent. The internal consistency for the 11-item scale used in this project was calculated to be $\alpha = 0.905$.

As illustrated in Table 1, when asked if using mail order pharmacy is less expensive than using a local pharmacy, a slight majority (51.6%) indicated they agreed or strongly agreed while nearly half of respondents were neutral (31.2%) or disagreed (17.3%) with this statement (item 1).

When asked if they would be concerned about running out of their medication if they used a mail order pharmacy, 41% of respondents agreed or strongly agreed while a slightly smaller percentage (39.8%) disagreed with this statement (item 2).

When asked if they would be concerned about whether they fully understood their medications and how to take them if they used a mail order pharmacy, a slight majority (51.1%) disagreed while over a quarter of respondents (28.2%) agreed or strongly agreed (item 3).

When asked if they would be concerned about not being able to speak face-to-face with a pharmacist if they used a mail order pharmacy, 41.2% of respondents agreed or strongly agreed while slightly over 20% were neutral and 38.4% disagreed. Notably, the percentage of respondents who strongly agreed with this statement (19.3%) was significantly higher than those who strongly disagreed at 12.3% (item 4).

Slightly more than 40% of respondents agreed or strongly agreed they would be concerned about their medications being lost or stolen if they used a mail order pharmacy. A somewhat higher percentage (41.1%) disagreed with this statement. Again, the percentage of respondents that strongly agreed was significantly higher than that which strongly disagreed (item 5).

Regarding the integrity of mail order medications, 34.9% of respondents agreed they would be concerned about whether the medication they received was exactly the same as that which the physician had prescribed. A slightly higher percentage (46%) disagreed with this statement (item 6).

When asked if they would be concerned about the effects of heat, cold, or moisture on their medications if they used a mail order pharmacy, 41.8% indicated they would while 37% disagreed with this statement. Once again, the percentage of those who strongly agreed with this statement was significantly higher than those who disagreed (item 7).

A higher percentage of respondents (40.9%) agreed than disagreed (32.9%) that they would be concerned about waste when their prescriptions were changed or discontinued if they used a mail order pharmacy. The percentage of those who strongly agreed with this statement was more than twice that of those who strongly disagreed (item 8).

Nearly 60% of respondents agreed they would be concerned about getting their medications when they needed them right away if they used mail order pharmacy. In contrast, 26.4% disagreed with this statement (item 9).

In the event they were required to use a mail order pharmacy, 62.9% of respondents agreed they would be concerned about losing their freedom to use the pharmacy of their choice. Only 24.1% of respondents disagreed with this statement (item 10).

If required to use a mail order pharmacy, 55.3% agreed they would be concerned about not having a pharmacist who knows them and the medications they take. In contrast, 26.8% of respondents disagreed with this statement (item 11).

To assess the impact that geographic location has on seniors’ attitudes toward mail order pharmacy, each respondent was classified as either rural or nonrural based on their residential ZIP code using the criteria employed by the Centers for Medicare and Medicaid Services (CMS). Responses to the 11 Likert-scaled survey items were then recoded as numeric values and means were generated for both groups. Differences between means were calculated using paired t-tests. The results appear in Table 2.
Also indicated in Table 2, the responses of seniors residing in rural ZIP codes demonstrated significantly higher agreement with statements related to concerns about lost or stolen medications (item 5), receiving the exact medication the physician prescribed (item 6), and the effects of exposure to heat, cold, or moisture (item 7). Two additional survey items approached statistical significance: the ability to speak with a pharmacist face-to-face (item 4) and ability to obtain medications quickly if needed (item 9).

Another question of interest was whether respondents who have used mail order pharmacy differ significantly in their attitudes from those who have not. To assess this question, each respondent was classified as “user” or “nonuser” and paired t-tests were calculated between means. The results of this analysis appear in Table 3.

The results indicated that respondents who had previously used mail service pharmacy had significantly higher agreement to item 1 (mail order is less expensive) than nonusers. For all remaining items, previous users had significantly lower agreement than nonusers. It should be noted, however, that both groups had mean agreement above neutrality for item 9 (getting my medications quickly when I need them), item 10 (freedom of choice), and item 11 (having a pharmacist who knows me and the medications I take). Thus, while both users and nonusers had net positive agreement to these items, nonusers demonstrated significantly stronger agreement than users.

When respondents were asked if they would oppose mandated mail order if it would cause the local community pharmacy they rely on for immediate medication needs to close, 533 (83.7%) said “Yes.” Respondents who indicated they would oppose mandated mail order if it would cause their local pharmacy to close were subsequently asked to indicate the highest level of risk they would be willing to accept for this eventuality by circling the appropriate value on the visual analog scale. Of the 482 responses to this question, the mean risk that respondents were willing to accept was 42.2%. That is, respondents indicated they would oppose mandatory mail order if there were greater than about a 4-in-10 chance that it would cause the loss of their local pharmacy.

To estimate the extent to which nonresponse may have represented a potential threat to validity, survey responses that were received within 7 calendar days of mailing were compared with those received later. The reasoning behind this analysis is the assumption that late responders are more likely to reflect the sentiments of nonrespondents. Thus, if a significant difference is found between early and late responders, it suggests that nonresponse bias may represent a threat to validity as the attitudes of respondents may not be representative of nonrespondents.

Of the 482 respondents to the risk assessment question, early respondents had a mean of 42.5% (n = 387), while late respondents had a mean of 40.8% (n = 85). A two-sample t-test revealed no significant differences between the 2 means.
### Respondent Comments

When survey respondents were asked to describe how the loss of their local community pharmacy would affect them, 265 (39.6%) provided written comments that cited a total of 402 negative effects. These anticipated effects of local pharmacy closure were subsequently classified according to their core themes as illustrated in Figure 1.

Inconvenience resulting from the effort required to secure an alternative pharmacy (22.9%) and reduced access to medications for urgent or acute care situations (21.9%) represented the most frequently cited negative effects of local pharmacy closure. The loss of a valued personal relationship with the pharmacist was cited by 14.9%, followed closely by feelings of worry, fear, stress, or sadness (13.7%).

More than 1 in 10 (10.7%) respondents cited concerns that the loss of the local community pharmacy would adversely affect the quality of their health care, and 6.2% indicated it would have a negative impact on their community’s health or economic viability. The loss of other (i.e., nonprescription) products and services that seniors rely on their local community pharmacy for was mentioned by 4.2% of respondents, underscoring the importance of the community pharmacy for fulfilling a variety of additional needs. The fear that losing their local pharmacy would lead to higher prices for their prescription medications was cited by 4.0%, and 1.5% indicated that losing their local pharmacy would make them angry.

Finally, when respondents were asked if they wished to share any additional comments or concerns about mail order pharmacies or prescriptions, 238 (35.6%) provided written comments. Each comment was reviewed to determine whether the attitude toward mail order was positive, negative, or both. Comments were subsequently subjected to content analysis to categorize each comment by theme (Figure 2).

The majority of comments that were received (71.4%) expressed a negative attitude toward mail order pharmacy. However, 17.1% were positive, and another 11.3% contained both positive and negative elements. Thus, 82.7% of comments contained one or more concerns and/or negative attitudes toward mail order pharmacy, while 28.5% contained one or more positive themes.

The most frequently expressed concern about mail order was seniors’ opposition to any mandate that would limit their right to use the pharmacy of their choice (30.8%). Of the 96 comments that mentioned this theme, the term “un-American” or a close facsimile was used frequently. Previous negative experiences with the use of mail order pharmacy were cited in 15.7% of comments, often paired with one or more specific examples.
A frequently cited specific concern with mail order was the timeliness or reliability of delivery (9.3%), especially during vacations or seasonal travel, when seniors may not have a consistent mailing address. Another frequently cited theme was concern about the accuracy of prescription processing and the quality or integrity of medications dispensed from mail order pharmacies (8.0%). Complicated, confusing, or inflexible procedures used by mail order pharmacy were mentioned in 7.4% of comments, with concerns regarding the unhelpfulness of customer service personnel and inflexible automatic refill policies being commonly cited examples. Other concerns related to a distrust of the U.S. Postal Service or other delivery services (3.5%), excess or unneeded medications being dispensed (2.9%), and concerns about the theft of medications from mailboxes (1.9%).

**Discussion**

As the role of mail service pharmacy in prescription benefit plans continues to be discussed, it is appropriate to solicit input and insight from those who are most affected by policies that would encourage or mandate its use. The results of this study suggest that elderly Americans are practical and pragmatic about the question. While most see a role for mail service pharmacy, they are also keenly aware of its limitations.

Community pharmacists have frequently expressed the concern that mandating the use of mail service pharmacy for long-term maintenance medications could potentially drive some pharmacies out of business. Requiring patients to obtain their chronic maintenance medications through a mail service pharmacy could result in insufficient volume to allow some...
community pharmacies to remain financially viable. If so, the impact would be felt most acutely by residents of rural areas, who may not have a convenient alternative source for immediate medication needs.

This study found that seniors living in rural areas have significantly greater concerns than their counterparts in nonrural areas about lost or stolen medications, receiving the exact medication the physician prescribed, and the effects of exposure to heat, cold, or moisture. Each of these concerns reflects the reality that older Americans in rural areas face in terms of the reliability and security of their mail delivery and the physical conditions to which their mail is routinely exposed. A much finer point was placed on these concerns in the numerous comments that were provided by seniors who live in rural areas.

When respondents were asked if they would oppose mandated mail order if it would lead to closure of the local community pharmacy they rely on for immediate medication needs, 83.7% responded affirmatively. When they were subsequently asked to indicate the highest level of risk they were willing to accept of this eventuality, respondents indicated an unwillingness to accept more than about a 4-in-10 chance of losing their local pharmacy as a result of mail order. Although these results do not validate the fears that mail order actually would threaten the financial viability of some community pharmacies, it does confirm that older Americans are relatively risk averse to this possibility, including those who regularly use mail order.

Limitations
The differences between the attitudes of mail order users and nonusers (Table 3) deserve further discussion. It is tempting to conclude that responses by users are more informed and therefore more accurate. However, it is equally likely that the differences observed are not the effect of experience with mail order but rather were the cause of that experience. That is, it is possible that seniors who had a pre-existing positive attitude toward mail order and were already reconciled to and accepting of its limitations were more likely to use mail order than those who were less favorably inclined. Because of the uncertainty regarding whether experience with mail order is a cause or an effect of respondent attitudes, these results should be interpreted with caution.

Respondents to the survey appeared to be representative of the national random sample that was used in the study. Moreover, there was no indication of possible nonresponse bias in the results of the analysis of early versus late responders. Still, the response rate for this study was less than optimal and this should be considered before generalizing the results to all Medicare-eligible persons.

Conclusions
The results of this study suggest that many seniors believe they have needs that cannot be adequately met by mail service or have relationships with local pharmacies and pharmacists that are important for maintaining their health and well-being. As a result, seniors are relatively risk averse when it comes to the loss of their local community pharmacies, indicating that, on average, they would oppose a mandatory mail order provision if there were greater than about a 4-in-10 chance that it would lead to the closure of their local pharmacies.

Beyond their specific concerns about mail service pharmacy, most seniors appear to oppose any restrictions on their freedom to use the pharmacy of their choice as a matter of general principle. This opposition is evidenced even among those who use and are generally satisfied with mail service pharmacy and should be considered by payers, policymakers, and benefit plan managers who may consider mandating mail service pharmacy for senior Americans.

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DISCLOSURES
This study was funded by the National Community Pharmacists Association (NCPA) Foundation and approved by the Midwestern University Institutional Review Board. Rupp reports that he has received a consulting fee from NCPA and received payment from Virginia Commonwealth University for consultancy on an unrelated study funded by NCPA.

REFERENCES


