006_Publication

RESEARCH

Evaluation of Online Prospective DUR Programs in Community Pharmacy Practice

OBJECTIVE: To gain a better understanding of both the contribution that third-party Online Prospective Drug Utilization Review (OPDUR) programs make to prescription drug therapy, and the economic burden these programs impose on community pharmacy providers.

DESIGN: On-site data collection

SETTING: 42 community pharmacies in Indiana

MAIN OUTCOME MEASURES: The cost per overridden OPDUR alert and the cost per nonoverridden OPDUR alert can improve the safety and effectiveness of prescription drug care by alerting pharmacists to significant medication-related problems. However, questions have arisen in recent years regarding the benefits of OPDUR programs versus the costs these programs impose on pharmacies.

RESULTS: Across all third-party claims, 10.3% were associated with an OPDUR alert. Of alerts received at the pharmacy, 88.1% were overridden by pharmacy personnel; the remaining 11.9% required an intervention by the pharmacist or technician. Of OPDUR alerts that were not overridden, interventions included consulting with the patient (55.4%), consulting the third-party payor (26.4%), and consulting the prescribing physician (17.6%). The typical OPDUR alert required 2.89 minutes of pharmacy personnel time, valued at $1.36. Overridden alerts were calculated to cost $1.20, while nonoverridden alerts cost $2.83. When the cost of resubmitting claims was factored in, the cost to pharmacies of not overriding an OPDUR alert was found to be $3.00.

CONCLUSIONS: Several recommendations can be made for improving OPDUR programs. First, the selectivity of OPDUR criteria should be increased through the adoption of more evidence-based criteria. Second, there should be greater coordination between OPDUR programs and in-store DUR systems to reduce redundancy. Third, the incremental costs to pharmacies of prescriptions associated with OPDUR alerts suggest that differential levels of payment may be needed to allow pharmacy organizations to dedicate the personnel time required to adequately respond to them.

KEYWORDS: Drug utilization review, Community pharmacy, Online prospective drug utilization review, third-party prescription benefit plans

J Managed Care Pharm 2000: 27-32

Authors

MICHELLE A. CHUI, Pharm.D., M.S., is a Doctoral Student in Pharmacy Administration, Purdue University, School of Pharmacy and Pharmacal Sciences, West Lafayette, IN; MICHAEL T. RUPP, Ph.D., is Professor of Pharmacy Administration, Midwestern University-Glendale Campus, Glendale, AZ.

AUTHOR CORRESPONDENCE: MICHELLE A. CHUI, Pharm.D., M.S., Purdue University, Department of Pharmacy Practice, 1333 Heine Pharmacy Building, West Lafayette, IN 47906-1333.

ACKNOWLEDGMENT: Supported by the National Community Pharmacists Association (NCPA) Foundation.

Copyright© 2000 Academy of Managed Care Pharmacy, Inc. All rights reserved.

by Michelle A. Chui and Michael T. Rupp

Drug utilization review (DUR) is defined in the Omnibus Budget Reconciliation Act of 1990 (OBRA) as "an authorized, structured, ongoing program that evaluates, analyzes, and interprets drug usage against predetermined standards and undertakes actions to elicit improvements and measure the results." The objectives of DUR are to improve the quality of patient care by assuring safe and effective drug use while concurrently managing the total cost of care.

Two approaches to DUR are recognized—retrospective and prospective. In retrospective DUR, prescribing practices are reviewed after the drug has been dispensed. A retrospective review of prescription claims data detects inappropriate patterns in prescribing, dispensing, or administering drugs, and serves as the framework for developing prospective standards and targeted interventions. However, since retrospective DUR is performed on historical prescription claims data, it does not provide an opportunity to intervene to correct problems with drug therapy prior to its use.

In contrast, prospective DUR involves the assessment of prescribed drug therapy before the medication is dispensed to the patient. Pharmacists may perform a prospective review of the patient's medication regimen during the prescription screening process. Although the pharmacist's participation in prospective DUR has historically been voluntary, prospective DUR became a mandated function when OBRA '90 went into effect in January 1993. In performing their prospective DUR activities, pharmacists identify and resolve problems of therapeutic duplication, drug/disease contraindications, drug/drug interactions, incorrect dosage or duration of therapy, drug allergy interactions, and clinical abuse/misuse. Most pharmacists are assisted in this activity by DUR software applications that are part of their pharmacy computer systems.[1,2]

Prospective DUR may also be performed by the pharmacy benefit manager (PBM) or claims processor at the time of electronic claims adjudication. PBMs developed online prospective DUR (OPDUR) to provide pharmacists with information that can assist them in preventing potential drug problems before a prescription is dispensed. These programs are often implemented as an expansion of an existing electronic point-of-sale (POS) claims processing system that receives prescription claim information electronically from a pharmacy, and screens the information for member eligibility, completeness of the prescription drug information, and errors in data entry.

Essentially, OPDUR programs add a therapeutic screening

TABLE 1 Problems Identified in OPDUR Alerts

Reason	N	%
Therapeutic duplication	272	20.3
Drug/drug interaction	197	14.7
High dose alert	158	11.8
Low dose alert	133	9.9
Underuse precaution	101	7.5
Drug pregnancy alert	78	5.8
Early refill, refill too soon	50	3.7
Drug selection opportunity, NDC not covered	48	3.6
Overuse precaution	46	3.4
Drug disease precaution	45	3.3
Maximum daily supply	43	3.2
Patient invalid, information incomplete	37	2.8
Drug age precaution	36	2.7
Ingredient duplication	20	1.5
Late refill	13	1.0
Excessive duration alert	13	1.0
Drug allergy alert	12	0.9
Invalid DUR message	7	0.5
Invalid provider number	6	0.4
Insufficient duration alert	5	0.4
Claim not processed/other	5	0.4
Spend-down required	5	0.4
Prior authorization needed	4	0.3
Drug/food interaction	3	0.2
Mail order only	1	0.1
DAW code invalid	1	0.1
Drug/gender alert	1	0.1
Total	1340	100.0

process to the POS system. If the new prescription claim information violates a preestablished criterion for appropriate drug use, an electronic alert that sometimes includes a payment denial is sent to the pharmacy. This alert typically indicates the type of problem detected, and whether an interacting medication was dispensed from the same or a different pharmacy as that submitting the claim. Thus, although OPDUR programs may appear to be largely duplicative of the pharmacist's in-store prospective DUR, they do maintain the unique advantage of being able to simultaneously screen all the medications a patient receives from all pharmacies, assuming the patient uses the prescription benefit plan during all of these transactions.

Since they were first implemented, OPDUR programs have resulted in a veritable flood of OPDUR alerts and claims rejections to pharmacy providers. Theoretically, these OPDUR alerts can save money and lives by alerting pharmacists to significant problems they may otherwise fail to recognize.

However, a growing body of anecdotal data suggests third-party OPDUR programs represent a significant burden to the operations of community pharmacies.[3-10] Although PBMs claim that OPDUR increases the safety and effectiveness of prescription drug therapy, questions have been raised regarding the actual benefits of these programs in terms of increased patient health and safety. To date, however, little objective empirical research has been conducted to confirm or refute these anecdotal reports and speculation.

The purpose of this project was to gain a better understanding of both the contribution that third-party OPDUR programs make to prescription drug therapy, and the economic burden these programs impose on community pharmacy providers. Four specific research questions were addressed:

- What proportion of third-party prescription drug claims result in an OPDUR alert?
- How do OPDUR alerts differ among third-party prescription benefit programs?
- How do community pharmacy personnel respond to OPDUR alerts they receive?
- What is the cost to community pharmacies of responding to OPDUR alerts?

Method

Data on OPDUR alerts were collected from community pharmacies in Indiana during February 1998 by trained observers recruited from fifth-year baccalaureate pharmacy students at Purdue University during their eight-week experiential rotations. Of 59 student/preceptor pairs who were contacted, 42 agreed to participate in the study.

Two data collection forms were developed for this study. The first form was used to collect information on pharmacy characteristics, such as name of pharmacy, name of computer system vendor, pharmacy hours, total new and refill prescriptions dispensed during the day and during the observation period, and number of personnel hours. The second form used standard response categories to collect specific data on each OPDUR alert observed. Information collected included reason for the alert, characteristics of alert overrides, pharmacist interventions, prescription payment status, number of claim resubmissions required, the PBM/claims processor that initiated the alert, time required to resolve the alert, and the drug(s) involved.

Alerts were classified by the reason for the alert or problem identified using the classification system developed by the National Council for Prescription Drug Programs (NCPDP).[11] NCPDP is the standards development organization (SDO) that maintains the electronic telecommunication standard used in virtually all third-party prescription drug programs in the U.S., although all programs do not use all codes that are available to describe the OPDUR conflict. Time required by pharmacy personnel to respond to the alert was recorded using the second hand of a watch or clock. Observers also were required to provide a brief narrative description of each problem and how it was resolved.

Data collection methods were piloted at three community pharmacies in Lafayette, Illinois. On the basis of this pilot test, a third data collection form was added to characterize in-store DUR alerts generated by the pharmacy's own computer system. Prior to data collection, sessions were held to train students on

proper documentation procedure, and observers were guided through several examples to understand how the forms were to be completed.

Observers collected data for five consecutive days during the second week in February 1998. They commenced data collection at staggered times, to minimize time-of-day bias. Observers were instructed to collect 10 consecutive OPDUR alerts each day for a goal of 50 OPDUR alerts during the five-day observation period. During the observation period, observers were dedicated exclusively to data collection. Observers recorded the time they began observing and were instructed to continue to observe until they had documented 10 OPDUR alerts or until the close of the work day.

While collecting information on ten OPDUR alerts, observers also collected information on all internal alerts that were encountered during the daily observation period. As a result, the number of OPDUR and internal alerts, as well as the time required to collect data, varied from pharmacy to pharmacy.

During the observation period, the primary investigator contacted each observer several times via telephone to answer questions or clarify procedures. The investigator also carried a pager that was accessible throughout Indiana, so observers could have questions answered immediately.

Data for the study were analyzed using SAS Statistical Software. An *a priori* level of alpha=0.05 was used for all significance tests.

Results

Of the 42 pharmacies participating in the study, 25 (59.5%) were chain and 17 (40.5%) were independently owned. The median prescription volume was 16.2 prescriptions per hour.

During the five days of data collection, a total of 18,770 prescriptions was dispensed during daily periods of active observation. Of these, 58% were new prescriptions and 42% were refills. The proportion of third-party claims submitted online was calculated by counting third-party and private pay prescriptions during one day of data collection at each study pharmacy. This proportion was then applied to the daily prescription counts during the five-day observation period, yielding an estimate that 13,070 (69.6%) third-party claims were submitted online by study pharmacies during hours of observation. Of these, 1,340 (10.3%) were associated with an OPDUR alert. Thus, slightly more than one in 10 of all third-party claims resulted in an OPDUR alert.

The six most commonly cited reasons, which accounted for 70% of all OPDUR alerts received, were therapeutic duplication (20.3%); drug/drug interaction (14.7%); high dose alert (11.8%); low dose alert (9.9%); underuse precaution (7.5%); and drug/pregnancy alert (5.8%) (see Table 1).

Of the 1,340 OPDUR alerts for which pharmacy personnel action were recorded, 1,181 (88.1%) were overridden. When asked to explain the reason for the override, pharmacy personnel indicated in 402 cases that they were already aware of the problem (34.2%); that in their opinion a problem did not exist (394 cases, 33.6%); or the problem was not clinically significant (321 cases, 27.3%). Of the remaining 159 (11.9%) OPDUR alerts that were not overridden, pharmacists responded by consulting the patient (55.4%), consulting the third-party payor (26.4%), consulting the physician (17.6%), or consulting the case worker (0.6%). Of prescriptions that were not overridden, 39% were dispensed with no changes; 32.7% were dispensed with the patient paying cash; 25.2 were changed and dispensed; and 3.1% were not dispensed (see Table 2).

Overall, 90.7% of all claims (1,213) associated with an OPDUR alert were eventually paid, although a claim resubmission was

TABLE 2 Pharmacy Personnel Response to OPDUR Alerts

	N	%
Total OPDUR Alerts	1340	100.0
Alerts overridden	1181	88.1
Alerts NOT overridden	159	11.9
Reason for Override	1181	100.0
Already aware of problem	402	34.2
Problem does not exist	394	33.6
Problem not clinically significant	321	27.3
Other	57	4.9
Alerts NOT Overridden	159	100.0
Patient consulted	88	55.4
Claims processor consulted	42	26.4
Physician consulted	28	17.6
Caseworker consulted	1	0.6
Prescription Outcome		
Dispensed as is	62	39.0
Filled, patient paid cash	52	32.7
Changed and dispensed	40	25.2
Did not dispense	5	3.1
Payment Status		
Paid	1213	90.7
Not paid	125	9.3
Not specified	2	0.0

Third-party prescription claims were submitted an average of 1.69 times in this study.

TABLE 3 Alerts and Overrides by Claims Processor

Claims Processor	Claims	Alerts (%)	Overridden (%)
Caremark	346	55 (15.9)[a]	44 (80.0)
Express Scripts	520	50 (9.6)	47 (94.0)
Medicaid	2888	180 (6.2)[a]	161 (89.4)
PAID	1613	198 (12.3)[a]	177 (89.4)
PCS	2239	235 (10.5)	194 (82.6)[b]
Other	5464	622 (11.4)[a]	556 (89.4)
Total	13,070	1340 (10.3)	1179 (88.0)

[a]p<0.05 compared to mean of 10.3%; [b]p<0.05 compared to mean of 88.0%

TABLE 4 Payment Status of Claims with OPDUR Alerts by Processor

Claims Processor	Claims Submitted	Claims Paid	Personnel Time (Minutes)	Submissions per Claim[a]
Caremark	346	343 (99.1%)	3.53	1.94[b]
Express Scripts	520	517 (99.4%)	2.39	1.53
Medicaid	2888	2871 (99.4%)	3.05	2.09[b]
PAID	1613	1591 (98.6%)	1.96	1.57
PCS	2239	2203 (98.4%)	2.53	1.51
Other	5464	5417 (99.1%)	2.74	1.66
Total	13,070	12,942 (99.1%)	2.65	1.69

[a]average number of times a paid claim was submitted; [b]p<0.05 compared to mean of 1.69

often necessary before payment was received. The remaining 9.3% of claims (125) were not paid. On average, pharmacists in the study were required to submit third-party claims 1.69 times to be paid.

Across all claims processors, the mean proportion of third-party claims that generated OPDUR alerts was 10.3%. Caremark was found to have the highest percentage of OPDUR alerts per claim (15.9%), followed by PAID (12.3%), PCS (10.5%), and Express Scripts (9.6%). As a group, the "other" category, which comprised 42 other claims processors, also had a relatively high percentage of OPDUR alerts (11.4%). Indiana Medicaid claims generated the lowest percentage of alerts per submitted claim (6.2%). Chi-square analysis indicated that Caremark, PAID and Indiana Medicaid were statistically different than the mean in the proportion of claims generating OPDUR alerts (see Table 3).

Across all third-party payors, the average percentage of alerts overridden was 88.0%, with Caremark having the lowest percentage (80%) and Express Scripts having the highest (94%). PCS (82.6% overridden) was the only claims processor whose alert override rate was significantly different than the mean at the probability level tested (p=0.05). Caremark, despite a lower override rate, had an insufficient number of claims to demonstrate a statistical difference.

Table 4 summarizes the payment status of OPDUR claims, the personnel time required to respond to them, and the average number of resubmissions required to be paid. Personnel time was calculated by summing the time required of the pharmacist and the technician to respond to OPDUR alerts that had been paid. Ultimate payment status was found to be virtually identical across processors (range=98.4% to 99.4%). ANOVA and Student-Newman-Keuls multiple comparison tests found no significant differences among claims processors in the total personnel time required to respond to OPDUR alerts when compared to the mean of 2.65 minutes. However, Indiana Medicaid and Caremark were found to be significantly higher in the number of submissions required per claim when compared with all claims processors.

Responses to OPDUR alerts by pharmacy ownership type and prescription volume were also compared. Prescription volume was calculated by dividing the total daily prescription volume by the number of pharmacist and technician hours in the pharmacy. The median volume was calculated to be 6.6 prescriptions per pharmacy personnel hour worked. Pharmacies were defined as high-volume if their dispensing rate per hour was greater than the median, and low-volume if it was less. Chi square analysis found no differences in override or intervention rates between chain and independent pharmacies, or between relatively higher and lower volume pharmacies.

Table 5 summarizes the cost of an OPDUR alert based on the time required by pharmacy personnel to respond to the alert. The average alert observed in this study required 1.96 minutes of pharmacist time valued at $1.20, and 0.93 minutes of technician time valued at $0.16, for a total of 2.89 minutes of pharmacy personnel time at a cost of $1.36 per alert.

Pharmacist salary and fringe benefits were valued at $36.88 per hour, an amount derived from a 1996 national salary survey and adjusted for inflation and regional fluctuation.[12] Technician salary and fringe benefit costs were determined through interviews with a convenience sample of pharmacists and pharmacy technicians in Indiana and set at $10.00 per hour.

Table 5 also illustrates the differential costs of alerts that were overridden versus those that were not overridden. Overridden alerts were calculated to cost an average of $1.16 in personnel time, while nonoverridden alerts (those requiring intervention) were calculated to cost $2.83 in personnel time. In addition to personnel time, pharmacies also incur a cost to resubmit claims when an alert results in a claim rejection. The cost of resubmission was valued at $0.25 per transaction and the average alert was resubmitted 0.69 times in this study, resulting in a resubmission cost per nonoverridden alert of $0.17. Thus, the total cost to pharmacies in this study of not overriding an OPDUR alert was calculated to be $3.00.

Table 6 illustrates the differential pharmacy costs of responding to a nonoverridden OPDUR alert received from different claims processors. Despite having the lowest alert rate per claim submitted, Indiana Medicaid alerts were the most costly to study pharmacies at $3.25 per nonoverridden alert received, although this was not significant at alpha=0.05. PAID was the only processor found to be significantly different (lower) in cost to study pharmacies than the mean.

Although a complete analysis of DUR alerts generated by the pharmacies' computer systems (internal alerts) was beyond the scope of this study, observers were instructed to record basic information for all internal alerts generated during the hours of observation. Twelve computer systems were represented in the 42 study pharmacies. The incidence of internal alerts was found to vary substantially among different computer systems, ranging from zero to 51.1% of all prescriptions (private and third-party pay) dispensed. Across all pharmacies, 14% of prescriptions that were dispensed generated an internal DUR alert. The five most common reasons for internal alerts accounted for 81.5% of all internal alerts received and generally mirrored those observed with OPDUR alerts: therapeutic duplication (31.7%), drug drug interaction (29.2%), high dose alert (8.9%), low dose alert (6.1%), and drug disease precaution (5.6%). These findings are not surprising, because the databases used by the DUR software programs of pharmacy computer systems are the same as those used by claims processors in their OPDUR programs.

Discussion

Third-party claims processors and PBMs market OPDUR programs as a value-added feature to clients. Clearly, these programs do have the potential to contribute unique value to the DUR process by integrating claims from multiple pharmacy providers. However, the finding that more than 88% of these alerts are overridden suggests that room for improvement exists.

Clearly, the response of pharmacy personnel to OPDUR alerts is an important element in determining the effectiveness of OPDUR. How pharmacists and technicians react to OPDUR alerts, and the eventual disposition of screened prescriptions that are associated with an alert, are important determinants of safe and effective prescription pharmaceutical care.

One possible explanation for the difference in override rates observed among claims processors in this study is that some PBMs may include mechanisms in their contracts that either force pharmacists to respond to OPDUR alerts, or that otherwise encourage response to alerts. This approach is used, for example, in some performance-based networks created in recent years. Alternatively, these results may indicate that the alerts generated by some OPDUR programs are more meaningful and amenable to action than others. In this study, the cost of responding to an OPDUR alert issued by one PBM (PAID) was found to be significantly lower than that of other payors and PBMs. This difference may be due to understandability of the OPDUR alert and directions to the pharmacist, or to the availability and competence of help-desk operators. Claims processors should work to improve both the interpretability of OPDUR alerts, and the availability and competency of help desk personnel to help pharmacists resolve problems efficiently.

Although the pharmacies in this study received OPDUR alerts on slightly more than 10% of all third-party claims submitted for payment, this rate was lower than expected on the basis of previous anecdotal reports. One possible explanation is that pharmacists may be incorrectly classifying all DUR system alerts as OPDUR alerts, not recognizing that many may be, and in this study were, generated by their own computer systems. Approximately two-thirds of all DUR alerts observed in this study were internal alerts, indicating that these may be contributing more to the net DUR burden imposed on practitioners than was previously recognized.

TABLE 5 Pharmacy Personnel Costs of OPDUR Alerts

	Pharm. Time minutes/$[a]	Tech. Time minutes/$[b]	Total minutes/$[c]
All alerts	1.96/1.20	0.93/0.16	2.89/1.36
Overridden	1.68/1.03	0.78/0.13	2.46/1.16
NOT overridden[3]	4.04/2.48	2.07/0.35	5.04/2.83

[a]*Pharmacist cost = $36.88/hour including fringe benefits*
[b]*Technician cost = $10.00/hour including fringe benefits*
[c]*Average number of claim resubmissions = 0.69/claim @ $0.25 per resubmission*

TABLE 6 Pharmacy Personnel Costs of Nonoverridden OPDUR Alerts by Claims Processor

	Pharm. Time minutes/$[a]	Tech. Time minutes/$[b]	Total minutes/$
Caremark	3.45/2.12	4.18/0.70	7.63/2.82
Express Scripts	5.00/3.07	0.00/0.00	5.00/3.07
Medicaid	4.56/2.80	2.67/0.45	7.23/3.25
PAID	1.63/1.00	1.05/0.18	2.68/1.18*
PCS	4.10/2.52	2.53/0.42	6.63/2.94
All processors	4.04/2.48	2.07/0.35	5.04/2.83

[a]*Pharmacist cost = $36.88/hour;* [b]*Technician cost = $10.00/hour;*
** $p<0.05$ compared to mean of 2.83*

The finding that neither pharmacy ownership (chain vs. independent) nor prescription volume significantly affected OPDUR override rates suggests that pharmacy personnel's perception of the relevance and validity of the alert is more influential to the decision to override an OPDUR alert than conditions of the practice environment. These findings should be interpreted with caution, however, as an in-depth evaluation of the practice environment's influence on the response to OPDUR alerts was beyond the scope of this study. Because 26.4% of alerts that were not overridden required a consultation with the claims processor, differential pharmacy costs of responding to an OPDUR alert between claims processors were examined. PAID at $1.18 was found to be significantly lower in cost to study pharmacies than the average. Once again, this difference may be due to understandability of the OPDUR alert and directions to the pharmacist, or to the availability and competency of help desk operators.

Limitations

According to a recent industry profile, chain pharmacies in Indiana account for 73.5% of the total, with independent pharmacies

accounting for the remainder.[13] In this study, independent pharmacies comprised 40.5% of the sample, a slight over-representation.

An assumption was made in this study that all claims submitted online underwent an OPDUR screening. Although this was true for the five largest claims processors in this study, how many of the other 42 claims processors maintain active OPDUR programs is unclear. To the extent that some do not, the proportion of third-party claims resulting in an OPDUR alert (10.3%) may be artificially deflated.

Data for this study were collected from a relatively small and geographically concentrated sample of pharmacies in one state. Moreover, these pharmacies were extern sites for Purdue University's experiential program. As a result, these pharmacies, their computer systems, and the third-party prescription benefit programs they support may not be representative of all community pharmacy practice.

The method by which the number of claims per processor was estimated in the study represents another limitation. The number was estimated from one-day counts of third-party claims during the data collection period and extrapolated to the total number of third-party claims submitted during the study. Although based on actual counts within each pharmacy, the resulting figure was an estimate.

Conclusion

Although this study revealed some important results, it also raises additional questions. Future research should involve more pharmacies with greater geographic dispersion. Because internal alerts were found to play an important role in the overall DUR burden imposed on pharmacists, future studies should specifically include them as a separate research question when examining DUR in pharmacies.

The results suggest that PBMs and pharmacy computer system vendors are not all alike with regard to the net effect of their DUR programs on pharmacy practice. Future research should focus more on examining individual PBMs and computer system vendors for differences in their DUR programs.

In addition to its implications for additional research, several recommendations may be distilled from this study. First, the selectivity of OPDUR criteria should be increased, specifically through the adoption of more evidence-based criteria. A logical place to begin improving OPDUR criteria is to concentrate on alerts that are frequently generated and routinely overridden by pharmacy personnel.

Second, better coordination between in-store DUR systems and OPDUR programs is needed if patients are to benefit from the intrinsic strengths of each while minimizing the number of duplicative or redundant alerts. OPDUR alerts for problems such as therapeutic duplication and drug/drug interaction may be appropriate if patients are receiving prescriptions at multiple pharmacies. However, if a pharmacy has and is using adequate in-store DUR software, OPDUR alerts such as high dose, low dose, under use, and the like may be unnecessarily redundant to the in-store system because they involve problems within a single prescription.

Third, corporate clients should become more knowledgeable purchasers of third-party prescription benefit plans. Prescription benefit managers whose OPDUR programs generate large numbers of alerts may not be providing better value to clients or better care to covered lives. Indeed, the system noise created by large numbers of trivial, irrelevant, or spurious alerts may cause a desensitizing "cry wolf" effect that discourages pharmacy personnel from carefully considering each OPDUR alert they receive.

Finally, the incremental costs to pharmacies of prescriptions associated with OPDUR alerts suggest that differential levels of payment may be appropriate for these claims. The total cost to pharmacies of not overriding an OPDUR alert in this study was $3.00. The cost differential between overriding and not overriding an OPDUR alert was calculated as $1.84, an amount that can mean the difference between profit and loss to a pharmacy enrolled in many third-party prescription benefit plans. PBMs that want pharmacy personnel to consider and act upon their OPDUR alerts must recognize the implications of these incremental costs to pharmacy providers. ■

REFERENCES

1. Kubacka RT. A primer on drug utilization review. J Amer Pharm Asso. 1996: NS36 (4): 257-61.
2. Yates WN, Rupp MT, Schondelmeyer SW. A drug utilization evaluation primer: conceptual and operational aspects. Published in Medispan.
3. Gondek K. Asssessent of the impact of pharmacy benefit managers. U.S. Department of Commerce. September 30, 1996.
4. Whittemore K. Online: the independent's view. NARD Journal 1994 (Oct); 34-37.
5. Soumerai SB, Lipton HL. Computer-based drug utilization review—risk, benefit, or boondoggle? N England J Med, 1995; 332(24): 1641-45.
6. Lipton HL, Bird JA. Drug utilization review in ambulatory settings: state of the science and directions for outcomes research. Medical Care, 1993; 31(12): 1069-82.
7. Ukens C. DUR alerts: Is the system broken? Does it need fixing? Drug Topics, 1997; Technology and Pharmacy: 16s-17s.
8. Bates DW, Leape LL. Pharmacies and prevention of potentially fatal drug interactions. JAMA, 1996; 275(14):1086-87.
9. McGuffey EC. Computers flag too much. Pharmacy Today, Sept 1997: 4.
10. Phillips CR, Bjornson DC, Chrischilles EA, et al. The pharmacist's assessment of second generation on-line prospective drug utilization review. J Managed Care Pharm, 1998; 4(2): 183-91.
11. NCPDP. Online real-time drug utilization review application manual. 1994.
12. Conlon MF. Salary survey. Drug Topics, 1997; 141(7): 84-102.
13. NACDS Chain Pharmacy Industry Profile. 1998.