Evaluation of Computer Generated DUR Alerts in Community Pharmacy

Drug Utilization Review (DUR) is recognized to be a professional, ethical, and, in the wake of OBRA '90, legal responsibility of the pharmacist. Properly performed, DUR can enhance the effectiveness of drug therapy and minimize its cost and risk to the patient. Pharmacy benefit managers (PBMs) and computer system vendors claim their automated DUR systems dramatically improve pharmacists' ability to fulfill this important role. However, virtually since their inception, questions have been raised about the benefits of online and in-store DUR systems relative to their impact on pharmacy operations.

While anecdotal reports from pharmacists abound, to date only one empirical study has been conducted to evaluate the impact of computer-assisted DUR programs in community pharmacy (Chui and Rupp, 2000). That study found that 88% of DUR alerts were overridden by pharmacy personnel. Among the reasons cited for overriding alerts were: personnel were already aware of the problem (34%), the problem did not exist (33%), or the problem was not clinically significant (27%). Of the remaining 12%, an average of $3.00 in personnel costs (1999 dollars) were required to respond to the alert. Among their conclusions, the researchers recommended greater selectivity in the alerts that are generated by PBMs in their online prospective DUR (OPDUR) programs, and by computer system and software vendors in their in-store systems. They also recommended better coordination between OPDUR and in-store systems to reduce redundancy of DUR alerts. Finally, the researchers suggested that, beyond being merely a time wasting nuisance, the cacophony of unnecessary and inappropriate DUR alerts in community pharmacy may actually represent a net threat to patient health and safety. This potential would appear to have at least indirect empirical support in research that has demonstrated a significant correlation between dispensing errors and the number of interruptions and distractions in a community pharmacy (Flynn, 1999).

The purpose of this project was to update and expand our previous study and, in so doing, to provide more definitive direction for the appropriate role of DUR in the delivery of prescription drugs in the community practice setting.

Goals and Objectives:
1. To examine how community pharmacy personnel respond to the alerts they receive
2. To quantify the cost to community pharmacies of responding to OPDUR and in-store alerts
3. To differentiate third party benefit managers used to generate alerts
4. To determine to what extent are OPDUR and in-store alerts duplicative

Methodology

Data on OPDUR and in-store alerts were collected from community pharmacies in Arizona, Iowa, Illinois, and Indiana during January-May 2003. Data were collected by trained observers recruited from pharmacy students during their experiential rotations in community pharmacies.

The Arizona-based primary investigator trained faculty collaborators at colleges of pharmacy in Iowa, Illinois and Indiana on the data collection methods used in the study. These faculty in

turn trained their student observers and supervised data collection. Observers collected data for three consecutive days during the first week of their community pharmacy experiential rotation.

Results

Of the 126 pharmacies participating in the study, 19.8% were chain, 16.7% deep discount, 25.4% food store-based , 35.7% independent, and 2.4% were clinic pharmacies. Participating pharmacies had the following university affiliation: Midwestern University – Glendale (Arizona) with 40.6% of pharmacies, followed by Midwestern – Chicago (Illinois) with 32.0%, Purdue University (Indiana) with 18.8%, and Drake University (Iowa) with 8.6%.

4,444 prescriptions were observed for OPDUR and in-store DUR alerts during the study. Of the 4,444 prescriptions observed, 1,475 (33.2%) generated one or more OPDUR alert. The top five alert types, which accounted for 64.4% of the total, were Therapeutic Duplication, Early Refill, Drug-Drug Interaction, Maximum Daily Supply/Plans Limits Exceeded, and NDC Not Covered. Alert types were categorized as clinical alerts and/or administrative alerts. Clinical alerts were defined as those that addressed therapeutic issues such as Drug-Drug Interaction and Drug-Allergy Alert. Administrative alerts were defined as those that are used to verify patient eligibility, encourage or require patients to use preferred drug products, or decrease over-utilization such as Patient Not Covered and Non-formulary Product. Four alert types, Therapeutic Duplication, High Dose Alert, Ingredient Duplication, and Excessive Duration, were categorized in both groups (See Table 1).

Of the 1475 OPDUR alerts that included recorded responses from pharmacy personnel, 873 (59.19%) were overridden. Because OPDPUR alerts were categorized into two groups, responses from pharmacy personnel were categorized similarly. 90.5% of clinical alerts were overridden, while only 55.5% of administrative alerts were overridden. Possible explanations for this difference which affected the overall override rate are discussed below.

Table 2 illustrates the differential costs of alerts that were already aware of the problem (28.6%); in their opinion a problem did not exist (288, 34.5%); or the problem was not clinically significant (238, 33.3%). Of the remaining 602 alerts (40.8%) that were not overridden based on the time required by pharmacy personnel to respond to the alert. Pharmacist and Technician salary and 20% fringe benefits were valued at $51.00 and $11.83 per hour, respectively (Ukens, 2004). Overridden alerts were calculated to cost an average of $1.30 in personnel time, while non-overridden alerts (those requiring intervention) were calculated to cost $9.83 in personnel time.

An analysis was conducted to compare third party processors to determine if differences existed in alert types, override rates, and personnel cost required to address OPDUR alerts. The top five third party processors accounted for 65% of prescriptions recorded in the study. They were: PAID (19.3%), Medicaid (all four states combined, 16.6%), PCS (15.3%), Express Scripts (7.9%), and Caremark (5.8%). When comparing the proportion of overrides for administrative alerts, Medicaid had the highest override rate, followed by PAID, Caremark, PCS, and Express Scripts. When comparing clinical alerts, PCS has the highest override rate, followed by PAID, Medicaid, Caremark, and Express Scripts, indicating that alerts generated by Express Scripts

required a greater number of interventions. Medicaid alerts cost the most in personnel time, followed by Express Scripts, Caremark, PAID, and PCS.

In-store alerts, generated by the pharmacy's own computer system, were also recorded. A total of 20 computer systems were represented. Of the 4,444 prescriptions that were recorded by observers, a total of 3,542 in-store alerts were recorded, this included 414 prescriptions for which two in-store alerts were recorded.. The top five in-store alert types which comprised 79% of the total were: Therapeutic Duplication (32%), Drug-Drug Interactions (26.7%), High Dose Alert (7.5%), Drug-Disease Alert (7.3%), and Low Dose Alert (5.5%). In 93.1% of the time, the in-store alert was overridden. Responses to in-store alerts were generally similar to that of OPDUR alerts.

A total of 315 of 4,444 (7.1%) prescriptions generated both an OPDUR and in-store alert. Of the 315 prescriptions that had both types of alerts, the OPDUR and in-store alerts were different 56.2% of the time and identical 43.8% of the time.

An analysis of the types of alerts that can be generated by multiple pharmacies was also conducted to determine whether they were duplicative of in-store systems, or were generated using information not available to a single pharmacy. 24.9% of Therapeutic Duplication OPDUR alerts were duplicated by an in-store alert. 15% of Early Refill alerts were duplicated by an in-store alert. 21.6% of Drug-Drug Interaction alerts were duplicated by an alert generated by the in-store system.

Discussion

The finding that 90.5% of all clinical OPDUR alerts, and 93.1% of all in-store alerts were overridden suggests that the vast majority of alerts meant to address clinical issues continue to be viewed as less than useful by pharmacy personnel. In comparison, only 55.5% of administrative OPDUR alerts were overridden. One possible explanation for the difference in override rates is that administrative alerts are more commonly associated with hard edits or claims rejections that do not allow overrides. Another reasons may be that administrative alerts may be more meaningful and actionable, which lead to a greater proportion of directed interventions by pharmacy personnel. In contrast, clinical alerts are frequently rated on a severity scale that require interpretation as to how serious the alert is and how best to respond to it. Also, while it is clearly the responsibility of the pharmacist to address clinical alerts, technicians can appropriately respond to most administrative alerts. .

The personnel cost of overriding an OPDUR alert was found to be $1.30. It is clear from the high override rates for clinical OPDUR and in-store alerts that pharmacy personnel are routinely ignoring these alerts. As a result, personnel may have developed work flow patterns that minimize the time required to address these alerts. The previous study cited a cost of $1.16 for overridden alerts, consistent with this study.

When OPDUR alerts required an intervention, the personnel cost jumped to an average of $9.83. This value is significantly higher than that reported in the previous study ($2.83). One explanation for this increase in personnel cost may partly be due to the types of alerts that are

being addressed. A higher proportion of administrative alerts were recorded in this study. If interventions were the results of hard edits or claims rejections, more time may have been required to address the issue. Furthermore, the hourly rate for pharmacists has significantly increased in the five years since the previous study, contributing to increased personnel costs.

Medicaid (all four states combined) was found to have the highest override rate for administrative alerts of the top five PBMs in the study. Because Medicaid is administered on a state-by-state basis, DUR criteria may be different from the other for-profit companies listed. Also, different third party payers may have differing proportions of hard versus soft edits. Medicaid alerts were also found to be the most costly in personnel time. This may be due to monthly spend-downs or administrative procedures set in place to ensure appropriate usage. Medicaid program alerts may be less easily handled than those of private PBMs. Whereas the other programs have attempted to streamline their DUR response procedures, Medicaid programs appear to be less inclined to do so. PAID and PCS were the least expensive alerts to address, due in part to their high override rate that requires less time than interventions.

Virtually all DUR programs, OPDUR and in-store, use the same database to determine their criteria for generating alerts. It was therefore anticipated that significant duplication would be observed between OPDUR and in-store alerts. The overall duplication rate of OPDUR and in-store alerts was 43.8%. However, the same level of duplication was not found among alert types that could be generated from multiple pharmacies, where 24.9% of Therapeutic Duplication OPDUR alerts, 15% of Early Refill alerts, and 21.6% of Drug-Drug Interaction alerts were duplicated by an in-store alert. This result suggests that third party benefit managers may be appropriately identifying clinical issues that would not be identified from a single pharmacy's patient profile.

Conclusion

While some improvement in administrative OPDUR alerts may have occurred since our initial study, the results of this study suggest that the vast majority of clinical OPDUR and in-store alerts are still being routinely overridden by community pharmacy personnel. Moreover, the costs to community pharmacy of responding to all DUR alerts continues to increase.

Several recommendations for improving computer-assisted DUR programs may be distilled from this study. First, the selectivity of OPDUR and in-store criteria should be increased, specifically through adoption of more evidence-based criteria, and standards should be developed so that criteria are consistent across all third party and in-store systems. Second, efficient mechanisms should be created to allow information regarding alerts resolved at the store level to be sent to third parties so that duplicative OPDUR alerts are not sent. Finally, alerts should have as much information as necessary to allow pharmacists to respond quickly and appropriately.

References

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Table 1. Problems Identified in OPDUR Alerts

Reason	Type	N	%
Therapeutic Duplication	Clinical/Admin	241	15.6
Early Refill/Refill Too Soon	Admin	233	15.1
Drug-Drug Interaction	Clinical	218	14.1
Max Daily Supply/Plan Limits Exceeded	Admin	163	10.6
Non-Formulary/NDC Not Covered	Admin	139	9.0
High Dose Alert	Clinical/Admin	96	6.2
Underuse Precaution	Clinical	69	4.5
Overuse Precaution	Clinical	63	4.1
Patient Information Incorrect	Admin	51	3.3
Patient Not Covered/Coverage Terminated	Admin	44	2.9
Prior Authorization Required	Admin	44	2.9
Low Dose Alert	Clinical	44	2.9
Drug-Disease Alert	Clinical	37	2.4
Drug-Age Alert	Clinical	22	1.4
Drug-Allergy Alert	Clinical	20	1.3
Drug-Pregnancy Alert	Clinical	20	1.3
Ingredient Duplication	Clinical/Admin	17	1.1
Late Refill	Clinical	6	0.4
Excessive Duration	Clinical/Admin	4	0.3
Drug-Food Alert	Clinical	4	0.3
Drug-Gender Alert	Clinical	3	0.2
Other		5	0.2
Total		1543	100

Table 2. Pharmacy Personnel Costs of OPDUR Alerts

	Pharmacist Time[1] Seconds / $	Technician Time[2] Seconds / $	Total Time Seconds / $
All Alerts	308 / 4.36	127 / 0.42	435 / 4.78
Overridden Alerts	80 / 1.13	53 / 0.17	133 / 1.30
NOT Overridden Alerts	638 / 9.04	240 / 0.79	878 / 9.83

[1]Based on Salary and Fringe of $51.00 per hour (Ukens, 2004)
[2]Based on Salary and Fringe of $11.83 per hour (Ukens, 2004)

Table 3. Override Rates and Personnel Time Costs

	N	Administrative Alert	Clinical Alert	Pharmacist Time	Technician Time
Caremark	78 (5.8%)	51.6%	90.0%	177 / $2.51	53 / $0.17
Express Scripts	106 (7.9%)	36.0%	85.7%	184 / $2.61	134 / $0.44
Medicaid (all states)	224 (16.6%)	79.0%	90.0%	617 / $8.46	74 / $0.24
PAID	260 (19.3%)	53.9%	90.2%	139 / $1.97	55 / $0.18
PCS	207 (15.3%)	47.9%	93.6%	118 / $1.67	85 / $0.28