
PHARMACY PRACTICE


Pharmacy Technician Unit Dose Certification Program

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INTRODUCTION

The use of pharmacy technicians (PTs) to check other PTs has been described in the literature.¹⁻³ In January 1990, the Riverview Hospital Pharmacy Department in Port Coquitlam, British Columbia which provides services to Riverview Hospital, Woodlands Hospital and the Forensic Psychiatric Unit began an in-house certification program for PTs. Successful certification permitted PTs to check unit dose cassettes filled by other technicians. Since the program's inception, seven PTs have participated and successfully completed the program. This report presents the findings of a pilot project which determined the accuracy of PTs in checking the unit dose cassettes filled by other PTs.

Description and Evaluation of Program

In addition to having completed a community college-based training program to be eligible for certification, PTs were required to have been a full-time employee with at least six months of pharmacy technician work experience. Certification was granted when the PT was able to check the unit dose cassettes for six wards, each containing three to four intentionally planted errors, with an accuracy rate of at least 99.8% (i.e., two errors per 100 orders or 1200 medication strips).

All seven technicians passed the initial testing. Quarterly audits were performed by the supervisory pharmacist to ensure that the accuracy rates were being maintained.

The study assessed the accuracy rates of pharmacists and PTs in checking unit dose cassettes. All pharmacists (N=5) and certified pharmacy technicians (N=7) responsible for checking the cassettes during a seven-month period from May to November of 1992 were included in the study.

To obtain data for our evaluation, retrospective analysis of an error log was performed. One error was

recorded if any problems were identified for an order by the ward and communicated to the pharmacy (Table I). (Note: An order is an eight-day supply of a medication as ordered by the doctor and may contain more than one strength of the same medication. For example, chlorpromazine 300 mg tid = one order = 24 x 100 mg tablets and 24 x 200 mg tablets = 48 doses).

The number of errors committed by each subject was weighted based on the number of strips they were responsible for checking. This allowed for calculation of the accuracy rate.

Table I. Classification of Drug Errors

Classification	Definition
Wrong Strength	All doses in the order are the incorrect strength
Two Different Strengths	One or more doses (but not all) in the order are the incorrect strength
Wrong Drug	All doses in the order are the wrong drug
Two Different Drugs	One or more doses, but not all pills, in the order are the wrong drug
Wrong Dosage Form	One or more doses in the order are in the incorrect form (e.g., SR instead of regular)
Empty Unit Dose Package	One or more packages in the order are empty
Double in a Unit Dose Package	One or more packages contain two doses in one packet
Shortage	Not enough doses were included to last the week
Missing Drug	No drug sent

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Data were analyzed using chi-square frequencies, Pearson Product-Moment correlations, and Student t-tests. All required tests were undertaken using the Statistical Package for the Social Sciences (Personal Computer) program (SPSS/PC+).⁴ An alpha level of significance of 0.05 was selected prior to commencement of the study.

Over the seven-month period, five pharmacists (one male, four female) and seven PTs (one male, six female) took part in the study. Pharmacists had a mean duration of 13.4 ± 7.0 years of work experience versus the PTs who had a mean of 7.8 ± 6.7 years of experience. The mean time in weeks since certification was 75.5 ± 40.1 weeks in the PT group.

A total of 33 errors were recorded in the error log book. A total of 208,592 strips were checked during the test period. Twenty-three of the errors could be assigned to pharmacist checkers and ten could be assigned to PTs checkers. Table II reports the accuracy rate of pharmacists and PTs (total errors divided by total strips checked) and

the mean error rate of pharmacists and technicians (the mean of the subjects' weighted error rates). There was no difference in the accuracy rate of pharmacists and technicians ($t=-0.31$; NS). This finding remained true regardless of the checker's experience as a checker ($r=0.2207$; $p=0.20$).

In terms of the types of errors found, it was noted that half of the errors that were missed by technicians were those of "incorrect strength". Pharmacists tended to miss errors due to "incorrect strength" (30.4% of pharmacist errors) or to have included "two different strengths" (30.4% of pharmacist errors). With pharmacist and technician checker data combined, over 60% of all errors were due to the wrong strength or two different strengths.

A major limitation of the study was our reliance upon nursing records to record errors. Nursing records are not always comprehensive, and this may affect the reliability of the error log as a source of data for assessing unit dose cassette errors. It is likely that additional errors occurred which were

not registered in the error log. This may result in an underestimation in the total number of unit dose cassette errors in addition to a possible alteration in the frequency distribution of error types.

Conversely, there are some situations where errors are over-estimated as well. For example, a medication reported missing may have been accidentally wasted.

Data collected for this study suggest that Riverview Hospital pharmacy technicians have received appropriate and adequate training for the checking of unit dose cassettes. Technicians who have obtained Riverview Hospital Pharmacy's certification appeared to check unit dose cassettes at a level of accuracy similar to that of pharmacists. Furthermore, the accuracy of both pharmacists and technicians was high, and surpassed the accuracy rates required to meet in-hospital standards of care criteria. ☒

REFERENCES

1. Becker MD, Johnson MH, Longe RL. Errors remaining in unit dose carts after checking by pharmacists versus pharmacy technicians. *Am J Hosp Pharm* 1978; 35:432-4.
2. McGhan WF, Smith WE, Adams DW. A randomized trial comparing pharmacists and technicians as dispensers of prescriptions for ambulatory patients. *Med Care* 1983; 32:445-53.
3. Woller TW, Stuart J, Vrabell R, et al. Checking unit dose cassettes by pharmacy technicians at three Minnesota hospitals. *Am J Hosp Pharm* 1991; 48:1952-6.
4. SPSSPC. *Statistical Package for the Social Sciences (Personal Computer)*. Version number 4.0.

Table II. Number of Errors Remaining After Checking by Pharmacists and Pharmacy Technicians

	No. of Errors	Total Strips Checked	Accuracy Rate(c)	Std. Dev.	Mean of Accuracy Rates(d)
Pharmacists(a)	23	154,132	99.99	0.034	99.97
Technicians(b)	10	54,460	99.98	0.032	99.96

(a) N = 5

(b) N = 7

(c) Total number of errors divided by total number of strips checked multiplied by 100, then subtracted from 100

(d) The average of individual subjects' accuracy rate