Effect of a robotic prescription-filling system on pharmacy staff activities and prescription-filling time

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Purpose. The effects of using an automated prescription-filling system, the ScriptPro SP-200, in an independent pharmacy were evaluated.

Methods. The study was conducted at Punches Pharmacy Plus, an independent pharmacy located in Clare, Michigan. The study design was a preinstallation and postinstallation assessment of the ScriptPro SP-200 automated prescription-filling system. Videotaping and work sampling techniques were used to collect the preinstallation and postinstallation data of the ScriptPro SP-200. The use of the pharmacy staff and the time spent in direct and indirect prescription-filling activities, such as receiving, order entry, filling, inspecting, packaging, dispensing, phone calls, and inventory management, were measured and compared preinstallation and postinstallation.

Results. With the installation of automation, the percentage of time spent by the pharmacy staff significantly changed ($p < 0.001$). Meanwhile, there was a statistically significant difference in terms of the percentages of time spent on various activities between the preinstallation and postinstallation of automation ($p < 0.001$). Before installation of automation, the direct and indirect prescription-filling times used were 6.07 and 2.11 minutes, respectively, to fill one prescription. Analyses of the average time spent per prescription showed that the installation of automation could save nearly 0.22 minute per prescription, especially filling time per prescription—which was significantly decreased from 2.63 to 2.07 minutes with an average of 0.56 minute saved ($p < 0.05$).

Conclusion. An automated system reduced prescription-filling time but required staffing adjustments to optimize the efficiency gained.

Index terms: Automation; Dispensing; Manpower; Personnel, pharmacy; Pharmacy, community; Robotics; Time studies

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The shortage of pharmacists and the increasing prescription workload due to the aging population have been major concerns affecting pharmacy operations.[1] According to a national survey of pharmacy practice in hospital settings, inpatient and outpatient hours of service increased in 2002 compared with 2001.[2] However, there was an 8.5% decrease in pharmacy staffing and a 7% vacancy rate. After struggling with the shortage of pharmacists and rising health care costs since the early 1990s, health care systems have increased the use of automation, which should reduce repetitive counting activity, increase the productivity of filling prescriptions, and reduce the risk of dispensing errors.[3] The main objective for using automated systems is to free pharmacists from involvement in tedious technical prescription-filling tasks so that they have more time to spend on patient care activities.[3-7]

The considerable increase in the use of automated systems in the past decades has not been paralleled with an expansion of automated system research. Several studies have evaluated the effects of automation in terms of inventory control, billing, workload, and potential medication errors[8-10]; however, the effect of the

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automated prescription-dispensing system on various prescription-filling activities and the required filling time spent by pharmacy staff has not been adequately quantified.

The automated ambulatory care prescription-filling systems in use today can be broadly classified into three types: robotic, cabinet cell, and countertop. The robotic type is the most comprehensive system with its pouring and labeling functions, and it is used in over a thousand pharmacy sites. In this study, the ScriptPro SP-200 automated prescription-filling system (ScriptPro LLC, Mission, Kansas) was studied (Figure 1). It is an automatic tablet and capsule system with a robotic arm for obtaining the appropriate size vial, collecting medications, and labeling vials. It uses bar-coded scanning to ensure that the correct medication goes from the container to the vial to the patient. It also uses a conveyer belt to transport the labeled vial to the inspection station, and it uses the bar-coded information to display an image of the tablet or capsule as an additional feature.

The goals of this study were to explore and compare the time spent by pharmacy staff on various activities before and after the installation of the ScriptPro SP-200 automated prescription-filling system and to determine the direct and indirect prescription-filling time required. Conducting a scientific analysis of the ScriptPro SP-200, one of the commonly used automatic ambulatory care prescription-filling systems, may prove to be important in providing pharmacy management information that can be used in decision-making.

Methods

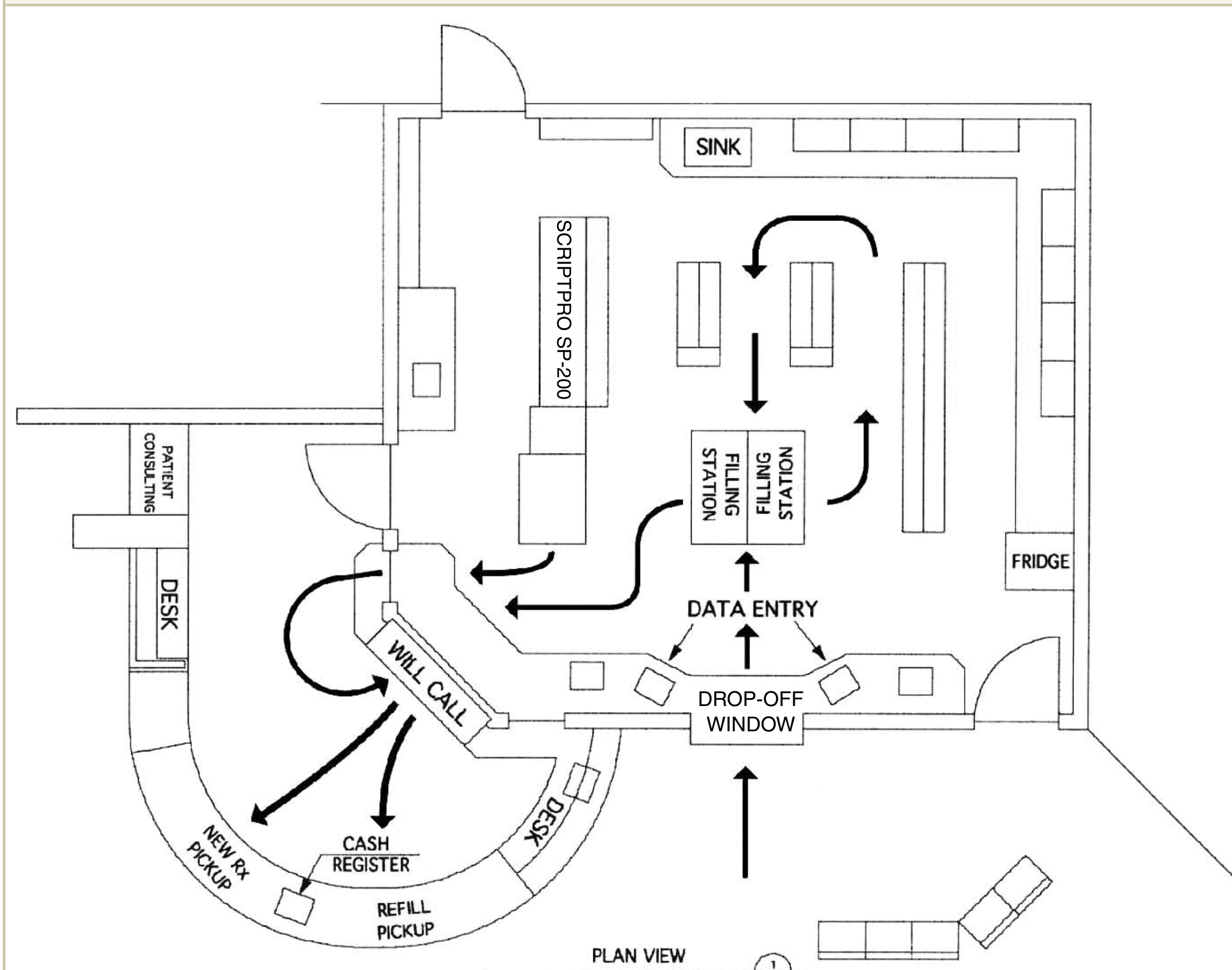
Study design and sample site. Preinstallation and postinstallation comparisons of automation were performed in this study in one pharmacy. The study site was Punches Pharmacy Plus, an independent pharmacy located in Clare, Michigan. The pharmacy filled a daily average of 350–450 prescriptions on weekdays in 2001. It was estimated that the pharmacy's workload would increase. The pharmacy management foresaw the difficulty in hiring additional pharmacists, so the decision to incorporate ScriptPro SP-200 for the pharmacy was made in November 2001. Punches Pharmacy mainly used pharmacists for inspection, dispensing, and problem solving. The technicians were mainly involved in receiving prescriptions, data entry, and filling activities. The prescription-filling process postinstallation of the ScriptPro SP-200 is illustrated in Figure 2 and includes (1) receiving a prescription and obtaining the related information at the drop-off window, (2) entering prescription data and generating labels at the data entry station, (3) filling prescriptions at filling stations or by using the ScriptPro SP-200, (4) grouping prescriptions when both manual and automated filling is used for the same patient's prescriptions, (5) inspecting prescriptions, and (6) packaging, storing, and dispensing filled prescriptions to patients. The additional step of grouping the manual and the automated prescriptions for one patient was needed when the automated system was used; this was the only step that was different in the workflow before and after the installation of the ScriptPro SP-200. Approximately 40% of the prescriptions were filled by the ScriptPro SP-200 during the study period.

Figure 1. ScriptPro SP-200 automated prescription-filling system. Photo reprinted with permission from ScriptPro.

Indicators of effectiveness. The time spent by pharmacy staff and prescription-filling time were selected as indicators of effectiveness. The time spent by pharmacy staff was classified into the following work sampling activities: receiving prescriptions, order entry, filling, inspection, packaging and storing, dispensing and patient counseling, phone calls, inventory management, and management and other (appendix). These activities fall under the categories of direct prescription filling, indirect prescription filling, and nonproductive activities. The direct prescription-filling activities include receiving prescriptions, order entry, filling, inspecting, packaging, and dispensing. Indirect prescription-filling activities include phone calls, inventory management, and management and other. Nonproductive activities include personal time and idle time. The differentiation between direct and indirect prescription-filling times was based on the filling times' association with an individual prescription. For example, management and inventory management may apply for multiple prescriptions. Prescription-filling time provides the microview of labor consumed for each prescription filling. The time units of prescription filling (direct and indirect labor times) were derived from the time spent by pharmacy staff and by the daily workload data. The prescription-filling times, with and without the ScriptPro SP-200, were adjusted for workload to provide a fair comparison.

Data collection and analysis. Videotaping, work sampling, and time study were used in both study phases. Sixty hours over a period of continuous five weekday operations were recorded for the preinstallation and postinstallation phases by six camcorders installed strategically throughout the pharmacy. The

Figure 2. Floor plan of pharmacy showing prescription-filling work flow after installation of the ScriptPro SP-200. The automated system filled about 40% of prescriptions during the study period, with the remainder filled manually.



preinstallation data collection was conducted between December 10 and December 14, 2001. The data collection of the postinstallation phase was not conducted until the smooth use of the ScriptPro SP-200 was confirmed. The data for the postinstallation phase were collected between June 3 and June 7, 2002. Videotaping was carried out during the hours of operations between Monday and Friday to represent the weekday activities. The approval for videotaping at the sample pharmacy was obtained from the pharmacy management and the University of Cincinnati Medical Center institutional review board. The study was explained and the researchers were introduced by the Punches manager to the pharmacy staff before installation of the videotaping equipment. The manager emphasized that the purpose of the study was to evaluate the performance of the prescription-filling systems, not the staff, and that the study results would not identify the performance of the individuals. The staff was asked to perform tasks at a normal pace.

Work sampling and time study techniques were applied to quantify the existing system's performance from the videotapes collected. Work sampling is a data quantification technique based on the laws of probability. A large number of observations are made over a period of time to provide a pattern of the distribution of time spent on the work activities. Work sampling usually uses random-interval observation for data collection. Random-interval work sampling by a random timer had been designed by industrial engineers for the study of work activity under cyclical working conditions. However, the noncyclical nature of activities in a pharmacy permits the use of fixed-interval work sampling.[11] Videotaping has been applied in determining prescription-filling time elements.[12] On the basis of previous studies conducted by the authors, it was determined that a five-minute work sampling interval was the threshold and the outer limit at which the average time spent on activities remained the same in pharmacy settings. In this study, the videotapes were analyzed using a conservative one-minute fixed-interval work sampling approach—the videotape was paused at one-minute intervals. The work activities of each staff member were analyzed, classified, and recorded by the work sampling categories developed (appendix). When the activity was difficult to classify, the videotapes' rewind and forward modes clarified the action.

The work sampling results documented the total time spent by pharmacists and technicians on each activity. However, because of the variation in the workload, these values cannot be used directly. To adjust for the effect of the varying workloads in the preinstallation and postinstallation ScriptPro SP-200 phases, the work sampling data for both phases were converted into direct and indirect prescription-filling time units by dividing the corresponding workload data. The sample size was calculated by the equation

$$N = \left(\frac{Z_\alpha \sqrt{p(1-p)}}{\varepsilon p}\right)^2$$

where (N = estimation of sample size, p = probability of activity occurrence, Z_α = quantile from the standard normal distribution for a two-tailed probability of $1 - \alpha$, α = significance level, and ε = relative error.

The percentages of time spent by the pharmacy staff on various activities with and without the ScriptPro SP-200 were compared by chi-square tests. The direct and indirect prescription-filling times before and after the installation of the ScriptPro SP-200 were compared using the Mann-Whitney *U* test. Two-tailed tests were used, and the significance level was 0.05. All of the statistical analyses were performed by using SPSS, version 11.0 (SPSS Inc., Chicago, IL).

Results

Pharmacy staff activities. The work sampling results that appear in Table 1 illustrate the time spent by pharmacy staff in performing various activities. In the preinstallation phase, a total of 17,509 minutes was observed with 5,284 minutes (30.18%) spent by pharmacists and 12,225 minutes (69.82%) spent by the technicians. Following the installation of automation, a total of 18,335 minutes was observed; importantly, the percentages of time spent by the pharmacy staff significantly changed ($\chi^2 = 25.54$; $df = 1$; $p < 0.001$). That is, the time spent by the pharmacists decreased from 30.16% (5,284 minutes) to 27.76% (5,090 minutes) while the percentage increased from 69.82% (12,225 minutes) to 72.24% (13,245 minutes) for the technicians. These changes also reflected the judgment of the pharmacy management in adjusting staffing required to accommodate the new system.

Meanwhile, the percentages of the direct prescription-filling time, the indirect prescription-filling time, and the nonproductive activities before the installation of automation were 58.38% (10,221 minutes), 19.81% (3,469 minutes), and 21.81% (3,819 minutes), respectively. By comparison, after the installation, those categories were 52.22% (9,575 minutes), 22.47% (4,120 minutes), and 25.31% (4,640 minutes). With the increased workload from 1,692 prescriptions to 1,773 prescriptions, the percentage of time spent on filling significantly decreased from 25.23% (4,418 minutes) to 20.08% (3,682 minutes). As a result, the total percentage of time spent on direct prescription filling decreased from 58.38% (10,221 minutes) to 52.22% (9,575 minutes). But unexpectedly, the percentage of time spent on the nonproductive activities increased from 21.81% (3,819 minutes) to 25.31% (4,640 minutes). Overall, in terms of the percentage of time spent on various activities, there was a statistically significant difference between the preinstallation and postinstallation of an automation system ($\chi^2 = 137.65$; $df = 2$; $p < 0.001$). There was a significant difference between the preinstallation and postinstallation of automation in terms of the percentage of time spent in each of the direct prescription-filling-related activities ($\chi^2 = 131.21$; $df = 5$; $p < 0.001$).

Prescription-filling time. Table 2 shows the time spent by the pharmacy staff to fill one prescription before and after the installation of automation with the exclusion of nonproductive time. Overall, before the installation, filling one prescription used approximately 8.17 minutes—2.50 minutes for pharmacists and 5.67 minutes for technicians. Following the installation of automation, the average time per prescription was reduced to 7.95 minutes with 2.39 minutes for pharmacists and 5.56 minutes for technicians. Analyses of the average time per prescription demonstrated that the installation of automation could save nearly 0.22 minute for each prescription, although there was no statistically significant difference ($Z = -0.419$; $p = 0.675$).

In addition, before the installation of automation, the direct and indirect prescription-filling times used were 6.07 and 2.11 minutes, respectively, to fill one prescription. By the comparison, after the installation of automation, the time spent on the direct prescription filling decreased to 5.53 minutes and the indirect prescription time increased to 2.42 minutes. It was found that the filling time per prescription was significantly decreased from 2.63 to 2.07 minutes with an average of 0.56 minute saved ($Z = -1.984$; $p < 0.05$).

Discussion

Pharmacy staffing and automation. As the results illustrate, the percentage of time spent by pharmacists decreased from 30.14% (5,284 minutes) to 27.76% (5,090 minutes),

Table 1.
Total Minutes (% Time) Spent by the Pharmacy Staff during Study Periods before and after the Installation of the ScriptPro SP-200

Category	Preinstallation (1,692 Prescriptions)			Postinstallation (1,773 Prescriptions)		
	Pharmacists' Minutes (%)	Technicians' Minutes (%)	Total Minutes (%)	Pharmacists' Minutes (%)	Technicians' Minutes (%)	Total Minutes (%)
Direct prescription-filling time						
Receiving	117 (0.67)	619 (3.54)	736 (4.20)	31 (0.17)	434 (2.37)	465 (2.54)
Order entry	40 (0.23)	2,322 (13.26)	2,362 (13.49)	111 (0.61)	2,549 (13.90)	2,660 (14.51)
Filling	356 (2.03)	4,062 (23.20)	4,418 (25.23)	183 (1.00)	3,499 (19.08)	3,682 (20.08)
Inspection	920 (5.25)	0 (0)	920 (5.25)	957 (5.22)	0 (0)	957 (5.22)
Packaging/storing	186 (1.06)	34 (0.19)	220 (1.26)	222 (1.21)	50 (0.27)	272 (1.48)
Dispensing/patient counseling	1,406 (8.03)	159 (0.91)	1,565 (8.94)	1,116 (6.09)	423 (2.31)	1,539 (8.39)
Subtotal	3,025 (17.28)	7,196 (41.10)	10,221 (58.38)	2,620 (14.29)	6,955 (37.93)	9,575 (52.22)
Indirect prescription-filling time						
Phone call	330 (1.88)	511 (2.92)	841 (4.80)	366 (2.00)	787 (4.29)	1,153 (6.29)
Inventory management	72 (0.41)	1,017 (5.81)	1,089 (6.22)	349 (1.90)	788 (4.30)	1,137 (6.20)
Management and others	769 (4.39)	770 (4.40)	1,539 (8.79)	743 (4.05)	1,087 (5.93)	1,830 (9.98)
Subtotal	1,171 (6.69)	2,298 (13.12)	3,469 (19.81)	1,458 (7.95)	2,662 (14.52)	4,120 (22.47)
Nonproductive						
Personal time and idle	1,009 (5.76)	2,216 (12.66)	3,225 (18.42)	937 (5.11)	3,110 (16.96)	4,047 (22.07)
Others	79 (0.45)	515 (2.94)	594 (3.39)	75 (0.41)	518 (2.83)	593 (3.23)
Subtotal	1,088 (6.21)	2,731 (15.60)	3,819 (21.81)	1,012 (5.52)	3,628 (19.79)	4,640 (25.31)
Total	5,284 (30.18)	12,225 (69.82)	17,509 (100.00)	5,090 (27.76)	13,245 (72.24)	18,335 (100.00)

Table 2.
Mean ± S.D. Prescription-Filling Time (min) before and after the Installation of the ScriptPro SP-200

Category	Preinstallation			Postinstallation		
	Pharmacists	Technicians	Total	Pharmacists	Technicians	Total
Direct prescription-filling time						
Receiving	0.07 ± 0.04[a]	0.37 ± 0.05[b]	0.43 ± 0.05[c]	0.02 ± 0.01	0.25 ± 0.04	0.26 ± 0.03
Order entry	0.02 ± 0.01[a]	1.37 ± 0.01	1.39 ± 0.11	0.06 ± 0.02	1.46 ± 0.16	1.52 ± 0.17
Filling	0.21 ± 0.04	2.41 ± 0.36	2.63 ± 0.38[c]	0.10 ± 0.08	1.96 ± 0.28	2.07 ± 0.30
Inspection	0.55 ± 0.07	0.00 ± 0.00	0.55 ± 0.07	0.56 ± 0.11	0.00 ± 0.00	0.56 ± 0.11
Packaging/storing	0.11 ± 0.02	0.02 ± 0.01	0.13 ± 0.02	0.12 ± 0.02	0.04 ± 0.06	0.16 ± 0.08
Dispensing/patient counseling	0.84 ± 0.14	0.10 ± 0.05	0.94 ± 0.17	0.68 ± 0.29	0.28 ± 0.42	0.96 ± 0.58
Subtotal	1.79 ± 0.20	4.27 ± 0.44	6.07 ± 0.59	1.55 ± 0.37	3.98 ± 0.50	5.53 ± 0.79
Indirect prescription-filling time						
Phone call	0.19 ± 0.05	0.31 ± 0.09[b]	0.50 ± 0.07[c]	0.21 ± 0.07	0.44 ± 0.07	0.65 ± 0.09
Inventory management	0.04 ± 0.01[a]	0.62 ± 0.35	0.66 ± 0.35	0.19 ± 0.08	0.48 ± 0.38	0.67 ± 0.37
Management and others	0.47 ± 0.21	0.48 ± 0.20	0.95 ± 0.36	0.44 ± 0.19	0.66 ± 0.31	1.10 ± 0.46
Subtotal	0.71 ± 0.23	1.40 ± 0.59	2.11 ± 0.63	0.84 ± 0.18	1.58 ± 0.57	2.42 ± 0.73
Total	2.50 ± 0.22	5.67 ± 0.98	8.17 ± 1.14	2.39 ± 0.47	5.56 ± 0.76	7.95 ± 1.22

[a]Comparisons between before and after in terms of the time spent by pharmacists, $p < 0.05$.
[b]Comparisons between before and after in terms of the time spent by technicians, $p < 0.05$.
[c]Comparisons between before and after in terms of the total spent time, $p < 0.05$.

while the percentage of time spent by technicians increased from 69.82% (12,225 minutes) to 72.24% (13,245 minutes). It seems that pharmacists' efforts were shifting to the technicians, which could partly explain why the pharmacy was able to handle the daily increased prescription volumes with decreased personnel. In the entire process of filling one prescription, the task assignment between the pharmacists and technicians became more efficient because of the existence of automation.

After the installation of automation, adjustments in pharmacy staffing were needed, namely shifting some pharmacist time to technicians. The ratio between total observed time and workload before and after automation was the same (preinstallation: 17,509 minutes/1,692 prescriptions; postinstallation: 18,335 minutes/1,773 prescriptions). Staffing adjustments were also associated with an increase in nonproductive time. Compared with preinstallation, the percentage of the nonproductive time increased significantly from 18.42% (3819 minutes) to 22.07% (4640 minutes), respectively, a possible result of overstaffing. The increase in nonproductive time was almost equivalent to the staffing added to handle the increased workload. This implies the possibility of using the same level of staffing in postautomation for handling the increased workload from 1,692 prescriptions to 1,773 prescriptions. The problems of how to manage the use of staffing after the introduction of automation and how to make good uses of automation with more efficiency will be a big challenge for the pharmacy management.

Effects of the automated prescription-filling system. The results document the effectiveness of the ScriptPro SP-200 in reducing prescription-filling time. The time spent on filling was significantly reduced by nearly 0.56 minute per prescription. With the exclusion of nonproductive time, the average prescription-filling time was reduced by nearly 0.22 minute, although there was no statistical difference. Further cost-effectiveness or cost–benefit studies should be guaranteed to conduct a more comprehensive economic evaluation.

A corresponding increase in the time spent on patient counseling was not observed when the filling time spent by the pharmacists was decreased. In the study by Angelo et al.,[13] it was revealed that the likelihood that a patient would receive counseling was not related to staffing levels, automation, or workload. Whether counseling occurred appeared to depend on many factors other than automation. In addition, it was interesting that no reduction in inspection time was observed. Theoretically speaking, because of the pictorial information displayed by the pill image on the monitor provided by the ScriptPro SP-200, a reduction in inspection time was expected. Further investigation will be required to determine how to maximize the effect of this pictorial feature on inspection time.

Our findings should be viewed in the context of our study's limitations. It was conducted by recording pharmacy activities and collecting data during a one-week period for a preinstallation and a postinstallation phase. Since this one-week period was arbitrarily chosen, it is quite possible that the content and the volume of prescriptions filled, as well as workload and staffing, may not represent the average seasonally adjusted conditions in the pharmacy. This study did not specifically analyze and compare the content and the volume of prescriptions filled during this period to other periods to adjust for any variations in prescription content, filling, and workload. In addition, because of the study design, the effects evaluated in this study were limited to the time spent by pharmacy staff filling prescriptions. A more comprehensive evaluation of the influence of the automated prescription system on inventory control and potential medication errors could not be given. Further research efforts should continue to determine the appropriate staffing after automation, to examine the pharmacy staff attitude toward pharmacy automation, to assess other effects of automation on medication errors, and to conduct a comprehensive economic evaluation.

Conclusion

An automated system reduced prescription-filling time but required staffing adjustments to optimize the efficiency gained.

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Appendix—Definitions of work sampling activities

Direct prescription-filling activities

- Receiving

Patient-presented prescriptions: greet patient and receive prescriptions, obtain insurance card, review prescriptions for readability or missing information, ask the patient to provide required information, go to the order-entry counter, place prescription orders into the to-be-entered bin.

Phone-in prescriptions from physician's office: transcribe prescription orders, place orders into the to-be-entered bin by patient name.

Phone-in prescriptions from patient: check voice mail messages; record call-in date, patient name, phone number, prescription number, and pick-up date; place orders into the to-be-entered bin by patient name.

- Order entry

Retrieve order from the to-be-entered bin, arrange prescriptions, establish a patient profile, review the patient profile, enter the physician's order into computer system, examine the drug regimen of the patient, conduct a medication-use evaluation, print out a prescription label, obtain label from the printer, place orders and labels into the to-be-filled bin.

- Filling

Manual counting: retrieve prescription labels from the to-be-filled bin; review prescription labels; obtain drugs; use the counting tray to count pills; discard the empty drug bottle; obtain a vial, pour medication into the vial; and cap it; replace vial with an oral liquid bottle with secured cap if needed; record drug lot number and expiration date on the sticker; attach the label to the filled vial or unit-of-use container; place drug bottles, filled vials (or other container), and script labels into the to-be-checked bin.

Automated counting: cap the filled vial, gather and place the receipts and filled vials into the to-be-checked bin, warm up the system, test the system, prepare and perform maintenance, load vials to the dispensers, change printer ribbons and cartridges and load blank labels.

- Inspection

Manual: retrieve drug bottles, filled vials, orders, and prescription labels from the to-be-checked bin; proofread labels one by one, including the name, strength, dosage form, and quantity of the drug; inspect and verify medication appearance (size, shape, color) and expiration; review patient profile as needed; attach auxiliary labels to vials or containers; waterproof labels on vials or containers; correct the problem by repeating appropriate steps if there is a problem; sign inspection log after verification; attach log sticker on order or inspection book; place checked prescription order in script organizer or drop prescription into the file box; tear off the label backing from the prescription label; discard the label backing and keep the receipt and information forms; group filled prescriptions, the receipt, and information forms into the to-be-packed bin by patient.

Automated: retrieve filled vials from the to-be-packed bin, scan bar-coded identification labels one by one, inspect and verify medication appearance and expiration, review patient profile as needed, waterproof the label on the vial, correct the problem by repeating the appropriate steps if there is a problem, group filled prescriptions with the receipt and information forms into the to-be-packed bin by patient.

- Packaging and storing

Obtain a paper bag, retrieve the filled prescriptions from the to-be-packed bin, place the filled prescriptions into the bag, attach the receipt and information forms and staple, store medication packed on the will-call shelf.

- Dispensing and patient counseling

Page the patient; greet the patient and ask the patient's name; obtain the medication from the will-call shelf; retrieve filled prescriptions from the bag; check filled items with the patient; ask the patient if there are any questions for counseling—if yes, ask a pharmacist to answer the patient's question—if no, or after the pharmacist's counseling, ask the patient to sign the third-party log; wait for the patient's signature; place the medication in the bag; hand the packed medication to the patient; receive the copay and see the patient off; provide basic clinical information; review the patient profile; answer questions about the prescription or provide drug information.

Indirect prescription-filling activities

- Phone call

Prescription-related: call the physician's office to obtain the proper interpretation of order as needed, call for the physician's refill authorization as needed, answer the phone call regarding refill authorization from the physician's office, call and inform the patient if the refill is not authorized; recommend different drug use.

Insurance-related: call the insurance company to verify patient's insurance status, discuss formula and payment issues.

- Inventory management

Record out-of-stock item on the order list, send the inventory order to wholesaler or dealer, refill stock on the drug storage shelf, return the remaining unused drugs back to the storage shelves, restock returned medications, load drugs into the dispensing cells, receive newcoming drug totes from wholesalers or dealers, process returned medications, monitor the remaining inventory, remove expired and recalled medication, others.

- Management and others

File medication orders, input error inspection, generate reports, perform scheduling tasks, close the cash register, complete the cash deposit, exchange small change, clean the work counter, organize the work area.

Retail services: sell nonprescription products, manage retail inventory, provide counsel about nonprescription products, speak with the patient or customer.

Any unidentified others.

Nonproductive activities

- Personal time and idle: personal telephone calls, lunch break, wait to perform a pharmacy task.
- Others: any activities beyond the categories defined.