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Drug Distribution: Options for Enhancing Efficiency

From tablet counters to robotic cassette fillers, automation is expanding in pharmacies across the country. Consider the impact the new technology is having on the long-term care world of punch cards and complex regimens.

**L. Michael
Posey**

In a health care system constrained by years of rampant inflation and cost increases fueled by advances in pharmacotherapy and biotechnology, pharmacists find themselves in an awkward economic position. Historically dependent on drug-product-based reimbursement, they find administrators of pharmacy benefit management companies and Medi-caid programs have learned too well ways in which to tighten the money screws. Yet the cost of interpreting, preparing, and dispensing a prescription remains static-not to mention the cost of stocking today's brands of miracle drugs.

Today's pioneer pharmacists are finding ways to win the war-even if they have to lose a couple of battles up front. The answer lies in automation of the drug dispensing and distribution tasks, coupled with elimination of medication errors through use of information technology. Following up on July's article on the move toward cycle filling,¹ TCP investigated other ways in which the basis of pharmacy practice is adapting for the new millenium.

Available Automation

The first task in discussing automation is to define the terms. In the acute care pharmacy-where the number of beds filled has fallen to less than 50 percent-automation is being used to both reduce the number of pharmacists and

technicians needed and to free up pharmacists for provision of clinical services and pharmaceutical care. In this environment, expensive, sophisticated, stationary systems are selling like hotcakes. State boards of pharmacy are struggling to define regulations on the stocking of systems such as SureMed and PyxisStation, which essentially are computer-controlled ward-stock systems of drug distribution.

Other examples of this type of technology are listed in Tables 1 and 2. Each of the units shown is designed to handle primarily solid oral dosage forms, and the cost of many units has limited market penetration, primarily to inpatient hospital units.

Table 1. Smaller Automated Systems Designed to Dispense Tablets or Capsules^a

Equipment (Telephone No.)	Capabilities	Dispensing Rate	Labeling	Estimated Cost
Automated 250, 330, 520 FDS (AutoMed) (800-424- 8520)	Holds up to 250 medication cassettes	60 packages/minute	System- generated	\$220,000
Automated Pharmacy Station	Robotic arm picks medication for carts, using bar code technology	N.A.	Prepackaged	\$450,000
Baxter ATC- 212; Baxter ATC Profile (800-323- 4315)	Holds 212 cannisters; 240, 360, 480 medications	ATC 212: 15-25 pieces/minute ATC 240: 50 pieces/minute	ATC host computer; printed manually	ATC 212: \$110,000 ATC 240: \$180,000
Baxter			ATC host computer;	Optifill I: \$900,000 Optifill II:

Optifill I, II			printed manually	\$450,000-\$500,000
Baxter Sure-Med (800-323-4315)	Unit dose-based system; 30-50 different lines; up to 200 lines with expansion systems	Point-of-use system	Prepackaged	\$12,000-\$30,000 Dispensing Center: \$20,000 Expansion cabinet: \$17,500 Cabinet: \$29,000 Supply cabinet: \$5,000
Dispensing Technologies, Inc. Script-Pro 200 Vial Filling System (800-851-2364)	Contains four different vial sizes; holds up to 200 different medications	Two tablets/capsules per second	Pharmacy's host system	\$60,000-\$70,000
Medserv by Medication Management Systems (800-671-0590)	Mobile units (carts) online communication with pharmacy system	Point-of-use system	Pharmacy's host system	
Pyxis MedStation and MedStation Rx (800-36-PYXIS)	Controls more than 30,000 different medications	Point-of-use system	Pharmacy's host system	Lease only: MedStation: \$575/month MedStation Rx: \$675/month
Selectrac-Rx (800-508-4576)	40 automated magazines; can hold up to 1,200 doses	Point-of-use system	Pharmacy's host system	In development

a Adapted from reference 2

Table 2. Larger Automated Systems Designed to Dispense Tablets or Capsules^a

Equipment (Telephone No.)	Capabilities	Dispensing Rate	Labeling	Estimated Cost
Baker Cells (800-845-7179)	Cells are approximately 10 by 12 inches	3-5 seconds for a 30-count vial	Pharmacy's host system	\$8.50 for small cell; \$16.50 for super cell on monthly lease
Baker AutoScript II System (800-551-6578)	Can hold up to 1,000 Baker cells	400 prescriptions per hour	Pharmacy's host system	\$300,000-\$400,000
Baxter International Bottle Filler System (800-323-4315)	Three filling stations; holds up to 636 different medications	125-500 prescriptions per hour	System-generated	\$1.1 million
Uhlmann Model UPS 300-M Blister Packing Line (301-227-6611)	Packages medication into blister packs	900 tablets/capsules per minute. Up to four different medications in the same blister ^b	Printed directly or separately	\$750,000-\$1,000,000

a Adapted from reference 2

b Medication molds can be changed in 15 minutes

But automation does not always mean tablets and capsules stored in machines with six-figure price tags. According to a recent national survey of pharmacies of all types, the most commonly used auto-mated devices are tablet counters and intravenous compounding machines.³ Other types of automated devices discussed in this article include the following³:

- Dispensing systems (floor stock)

- Profile-specific dispensing systems
- Patient-specific repackaging systems
- Vial filler (stand-alone)
- Fill and label devices
- Imaging systems (video display of facsimile of original prescription)
- Bedside documentation of administration
- Picking machines with unit-of-use containers
- Devices that sort medications by patient
- Interfaced vial-filling devices

Among those pharmacies identified in the survey as using automation, two-thirds were planning to acquire more technology. But among the two-thirds of the pharmacies that reported no use of automation, only about 10 percent were planning to acquire such systems.

A second article in the same issue of Hospital Pharmacy discusses application of technology to reduce medication errors.⁴ But that author also emphasizes that automation can increase errors of some types. He further notes that the greatest opportunity for error is in the gap between dispensing and administration, and in the fact that most automated systems have not addressed that gap.

Thus, pharmacists are using a wide variety of types of automation to decrease the time required and the medication errors associated with all steps in the drug-dispensing process. About one-third of pharmacies overall represent the pioneers in the automation movement, and they plan to add to their capabilities. Is this trend a fad-or a permanent change in pharmacy practice? And how will it affect the long-term care pharmacy? Let's take a look.

Why the Mergers?

"All pharmacies that are going to be survivors will have to look at regional or national systems to decrease costs," maintains Jeffrey M. Stamps, B.S., FASCP, regional vice president of operations for Omnicare's midwest region. "For an automated system to work in long-term care, it will have to be med-pass-specific and it will need to be mobile. Large, expensive, stationary units will be of little use in long-term care."

Stamps told TCP that Omnicare is making a number of changes to increase

the efficiency of its dispensing operations. "We are shifting a number of our homes to cycle filling supported by automation," Stamps says. "We have a limited number of facilities using bar-code verification of refills and new prescriptions. Some facilities are using computerized data-management systems and care plans to avoid the need for pharmacy personnel to rewrite orders."

Steven Hord and Rob Godwin of the southeast region of Pharmacy Corporation of America explained that automated dispensing units are being implemented first in assisted-living facilities and other types of personal-care homes. "We are focusing on decreasing errors in filling and administration," the duo told TCP. "From our punchcard systems-which permit easy detection of wrong tablets in each clear pouch-to using technology to check our accuracy, PCA is focusing on the use of economical systems that reduce costs and are flexible enough to work in many different types of long-term care facilities."

Addressing Medication Errors

An important impetus to increasing the use of automation in long-term care is to reduce medication errors, which are once again on the action agenda of the Food and Drug Administration and of concern to Congress.

"We could improve documentation and use bar-code technology to match drugs, medication orders, and residents," notes Stamps. "While I don't see currently available automation decreasing nursing administration times, automation can decrease the assimilation time in pharmacies and decrease errors in prepackaging and drug dispensing."

Solving Practical Problems

Linking computerized databases with medication-ordering technology is a final area of application of the new technology. Raymond E. Schwartz, RPh, MBA, vice president for operations at MHA Managed Healthcare Associates tells TCP of an exclusive deal it is providing to members of its group-purchasing organization. Through ProxyMed, MHA will offer ProxyCare via a computer terminal in each nursing station in client homes. There, nurses and physicians will key in medication orders, and the computer will-in about eight seconds-compare the order with third-party reimbursement formularies and

patient allergies. Problems will be flagged before the physician or nurse leaves the computer, eliminating telephone calls from the pharmacy.

"Our goal is to get decision-making information as close as possible to the physician," Schwartz explains. "The system will also provide transmittal of the order electronically to the pharmacy, eliminating rekeying of the information. Unreadable handwriting and poor-quality fax copies of the orders will become a thing of the past. As the system is implemented, we can also use it for making therapeutic conversions to preferred agents and to avoid reimbursement problems."

Schwartz also says that some technology from the wholesale drug industry will be used to help clients with inventory checking and order verification. The system can also save clients money by double-checking orders for the lowest available bid prices of agents.

When Will You Automate?

The high price tag of automation presents yet another barrier to pharmacists who are already squeezed economically on many sides. But failure to implement those systems that make the pharmacy competitive for the future could have even worse consequences.

It's a high stakes game in which you can't afford to fold. You have to assess the available choices, decide what your client facilities need, and find the financing to make it happen.

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L. Michael Posey is Academics Editor.

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