CHAPTER 5

Pharmacy Automation Systems

Steve Rough and Joel Melroy

CHAPTER OUTLINE

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KEY DEFINITIONS

Adverse Drug Event—an injury resulting from a medication or lack of intended medication.

Automated Dispensing Cabinets—secure storage cabinets typically located decentrally on patient care units capable of handling most unit-dose and some bulk (multiple-dose) medications due to storage limitations.

Automation—any technology, machine, or device linked to or controlled by a computer and used to do work. Automation is designed to streamline and improve the accuracy and efficiency of the medication use process.

Carousel Automation—a medication storage cabinet with rotating shelves used to automate dispensing.

Centralized Robotic Dispensing System—centrally located devices designed to automate the entire process of medication dispensing including medication storage, distribution, restocking, and crediting of unit dose medications.

Medication Error—any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient or consumer.

Supply Chain Management—the management of the pharmaceutical order-to-pay process including management of inventory and distribution of supplies throughout the medication use process.

Technology—anything that is used to replace routine or repetitive tasks previously performed by people, or which extends the capability of people.

Introduction

In today's health care marketplace, payers and patients demand high quality, efficient, and cost-effective service. Through successful implementation of technological advancements, pharmacy departments can play a vital role in providing high quality and efficient service to patients. Efficient use of technology and automation is a prerequisite to the survival of the profession and the advancement of pharmacist patient care services.[1]

The purpose of this chapter is threefold: (1) to provide background on the use of automation in inpatient pharmacy practice, (2) to describe several pharmacy automated dispensing technologies as well as their advantages and disadvantages and intended roles within the medication use process, (3) to identify best practices for maximizing the safe and efficient use of automation, and (4) to provide a predictive model for the impact automation will have on the future of pharmacy practice. On completion of this chapter, the reader should have an understanding of the role of pharmacy-based automation in an integrated health system as well as practical tools for implementing such automation.

Current Trends

The application of automated dispensing systems within the practice of pharmacy began in the early 1960s. However, changes in the health care system and the profession's transition to pharmaceutical care have dramatically increased the demand for incorporation of automation into pharmacy practice over the past 15 years. Corporate and organizational goals of reducing costs, improving operating efficiencies, growing revenues, enhancing safety and quality, integrating and managing data, and providing outstanding customer service are primary drivers of this trend. Pharmacy managers are often expected to improve efficiency by reducing pharmacy staff and nursing workload while increasing quality through reducing medication delivery time and improving patient safety and clinical programs. All of these important initiatives can be accomplished through appropriate use of automation. As the profession accepts increasing responsibility for improving patient outcomes through implementation of pharmacist patient care services, automation continues to be relied upon to free the pharmacist from technical tasks. Shortages of qualified pharmacists and technicians coupled with shrinking operating budgets are leading managers to explore technologies that can complete less cognitive distributive tasks traditionally performed by pharmacists and technicians.

Strategic partnerships between health systems and pharmaceutical wholesalers are increasing the rate of availability and deployment of new automation and technologies. Wholesalers serve as intermediary businesses that purchase pharmaceuticals from drug manufacturers for resale to pharmacy customers. Rising complexities and costs of day-to-day pharmacy operations, shrinking personnel resources, and limited technology expertise have led pharmacy directors to seek partnerships with vendors possessing a broad line of automated products. Coupled with traditionally strong pharmacy/wholesaler business relationships and declining wholesaling drug distribution business margins, this trend has created incentives for wholesalers to develop more profitable (automation-related) business ventures. Thus, since the mid-1990s wholesalers have acquired pharmacy technology and automation companies at a rapid rate. Mergers between drug wholesalers and medication dispensing automation companies has been a key component to drug wholesaler growth and survival. Traditional automated distribution and information system technologies used by wholesalers to provide services to their pharmacy customers are now being sought after by these same customers to improve pharmacy purchasing and inventory management