CHAPTER 7

Medication Distribution Systems

Stephen F. Eckel, Jami E. Mann, and Fred M. Eckel

LEARNING OBJECTIVES
After completing this chapter, readers should be able to:

1. Describe the advantages and disadvantages of floor stock, patient prescription, and unit dose medication distribution systems.
2. Contrast the advantages and disadvantages of centralized and decentralized models of distribution.
3. Discuss the evolution of medication distribution over the past few decades and its impact on the professional role of pharmacists.
4. Identify technologies used in managing medication distribution.
5. List the attributes of a good medication distribution system.
6. Define key terminology associated with medication distribution systems.

KEY TERMS AND DEFINITIONS

■ Automated dispensing cabinets (ADCs): Point-of-use medication storage devices located in patient care areas, which are designed to allow nurses quick but accountable access to medications. Most systems have some form of user identifier or password that restricts access to the medications.

■ Centralized pharmacy services: A model that distributes medications from a centralized pharmacy location.

■ Decentralized pharmacy services: A model that distributes medications from multiple ADCs located on the nursing unit. Some models might utilize a decentralized satellite pharmacy, but this is not as common today.

■ Floor stock system: A system of distribution that consists of an individual storage area on each nursing unit where drugs are stored prior to preparation and administration by the nurse. The medications are usually unsecured in this system, and the role of pharmacy is primarily distributional.

■ Medication administration record (MAR): A record of all current medications prescribed for each patient. The records contain information on the drugs, administration times, and directions for use. Nurses use MARs to know what medication each patient should receive at what time and how. MARs are also used to document that the drug was given by whom and at what time. Although this was historically documented on paper, most hospitals now utilize electronic MARs.

■ Medication profile: The primary record that pharmacists use to document patient medications.

■ Patient prescription system: An antiquated system of medication distribution that consists of patient-specific containers with a 2- to 5-day supply of drugs delivered to and stored on nursing units. Within this system, drug orders are transcribed by the nurse and reviewed by a pharmacist although no patient information is available to the pharmacist.
**INTRODUCTION TO ACUTE AND AMBULATORY CARE PHARMACY PRACTICE**

- **Unit dose system:** A system of distribution coordinated by the pharmacy that dispenses medication orders to be administered, not prepared, by the nurse. This system is characterized by medications contained in unit dose packages and dispensed in ready-to-administer form with no more than a 24-hour supply being delivered or available on the patient care unit at any time. Pharmacists monitor and coordinate unit dose systems by reviewing all medication prescriptions against patient medication profiles and managing the distribution and storage process.

- **Unit-of-use package:** A container with the exact dose needed for patients in a ready-to-administer form, not requiring any preparation or selection by the nurse upon documentation.

---

**INTRODUCTION**

The role of the pharmacist has always been to ensure that patients receive the appropriate medication in an acceptable dosage form that facilitates safe administration and improved outcomes. At different times in pharmacy’s evolving responsibilities, some aspects of this role seemed to receive more attention. In the early days of institutional pharmacy, the pharmacist’s role was distributional—developing systems of drug delivery that reduced waste and minimized medication errors. Pharmacists have become more and more involved in clinical responsibilities as time has progressed. Despite the expanding clinical role of pharmacists in inpatient and ambulatory settings, distribution of drug products will continue to be an important responsibility of pharmacists in healthcare institutions.

The unit dose system transformed the evolution of institutional pharmacy practice. The system required pharmacists to receive individual patient medication orders, which changed their roles and enabled them to become members of the healthcare team. The pharmacist would review those orders against patient medication records prior to preparing and dispensing patient-specific doses in a ready-to-administer form. This allowed the hospital pharmacist to assume responsibility for a patient’s drug therapy and established a platform for clinical pharmacy and pharmaceutical care to be successful. Over the past 50 years, there have been many improvements to the unit dose system, mostly through advancements in technology and the expanded clinical role of the pharmacist.

This chapter provides a brief overview of the history of the medication distribution system leading to unit dose, a discussion of the unit dose system, an analysis of different technologies that assist drug distribution today, and thoughts on the future of medication distribution.

---

**HISTORY OF MEDICATION DISTRIBUTION SYSTEMS LEADING TO THE UNIT DOSE CONCEPT**

The role of the hospital pharmacist 60 years ago was primarily confined to the basement. The space was small, and the personnel involved in drug distribution were few. The pharmacist’s primary role was to purchase and prepare medications to be used on the nursing unit. The physician would prescribe the medication, and the nurse would administer it to the patient. The pharmacist was rarely involved in assessing the appropriateness of therapy. He or she simply made sure that the nurse had a supply of medication for the patient. If repackaging or compounding of the medication was required, the pharmacist accepted responsibility for this function with the exception of intravenous (IV) admixtures, which nurses usually prepared on the nursing unit.