How to Prevent Medication Errors in Long-Term Care: Part 2

Over the years, the Institute for Safe Medication Practices has gained a great deal of insight into the medication-use system through reports of medication errors and by performing on-site analyses at various health care organizations. Part 2 reviews the key elements of the medication-use process, contributing factors that lead to medication errors, and recommendations for consultant pharmacists that will assist long-term care facilities in preventing medication errors.

Key words: Adverse drug events, Consultant pharmacist, Contributing factors, Medication errors, Nonpunitive environment.

Abbreviations: ADE = Adverse drug events, ISMP = Institute for Safe Medication Practices.

Environmental Factors
Having a well-designed medication-use process offers the best chance of preventing errors; however, sometimes the environment in which we work contributes to medication errors. Environmental factors such as poor lighting, temperature, cluttered workspaces, noise, interruptions, staffing pattern deficiencies, and variations in workload often contribute to medication errors. These elements make it difficult for staff to remain focused on the tasks involved. Inefficiencies in workflow may cause the setting of poor priorities, and unproductive time management can result in an environment that is fraught with complex work processes that significantly increase the risk of errors.

Staff Competency and Education
Staff education is an important strategy to prevent errors only if it is combined with other strategies (technology, standardization, double checks, etc.) that strengthen the
medication-use system. However, when used alone, it is a weak strategy, with little sustained effect.

It is impossible to educate all practitioners about all things that they need to know to perform flawlessly when prescribing, dispensing, or administering medications. Thus, over the course of time, even the most educated, experienced, and careful health care practitioner can make errors that result from a lack of knowledge and other contributing factors.

Many practitioners have limited awareness of well-known, error-prone situations reported within their own organizations or in published literature. Without this information, staff members are more likely to make similar errors; with this information, they can assist the organization in identifying ways to prevent similar errors from occurring or recurring. Consultant pharmacists are often involved in the orientation process and training of long-term care staff about medications; this education should include providing

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Breakdowns in the Key Elements Can Lead to Errors

These are examples of how errors can occur. Note that a single error may involve multiple key elements.¹

Patient Information
- An elderly woman, with a history of renal insufficiency, receives a prescription for digoxin 0.25 mg.
- A physician documents information in the wrong chart because he has two patients with the same name.
- A patient is noncompliant with prescribed therapy because he can’t afford to pay for the prescriptions.

Drug Information
- A pharmacist believes that the proton-pump inhibitor lansoprazole (Prevacid) can be therapeutically interchanged with the antipsychotic aripiprazole (Abilify) since they share the suffix “prazole.”
- An elderly patient receives methotrexate 7.5 mg once a day, when the prescriber wrote “once a week” on the order. The pharmacy order-entry system did not alert the pharmacist of the overdose when he entered the order in the computer system.
- A physician uses a print copy of a drug reference to determine a drug’s dose, but the information for that drug contains an error. An errata page was mailed but never made it into the drug reference.

Communication of Drug Orders and Other Drug Information
- An order for a potassium supplement is written using the abbreviation “qd” (once a day), which is confused with “qid” (four times a day), resulting in a daily four-fold overdose.
- A patient’s newly prescribed treatment was delayed because the order was unclear and the physician could not be reached.
- A verbal order is given to a nurse for alprazolam for anxiety disorders, but is misinterpreted as lorazepam, also for anxiety. In addition, the process of writing down the verbal order, then reading it back to the prescriber, is not used.

Drug Labeling, Packaging, and Nomenclature
- Similar drug names and packaging led a pharmacist to take trazodone (Desyrel), prescribed for depression, off the storage shelf instead of tramadol (Ultram), which was prescribed for pain.
- Incomplete instructions on a drug label ("take 2 tablets daily") led a patient to take 2 tablets once daily instead of 1 tablet twice daily as intended by the prescriber.

Drug Standardization, Storage, and Distribution
- Isopropyl alcohol is inadvertently used to reconstitute an antibiotic suspension because it is stored close to the distilled water in the compounding area.
- A pharmacist dispenses ZYPREXA (for schizophrenia) instead of ZYRTEC (for allergies) because the products are stored close together and available in similar strengths.
- A nurse instills Hemocult drops into a resident’s eyes because these drops are stored with the eye drops on the medication cart.

Use of Devices
- A parent, who is given a hypodermic syringe (instead of an oral syringe) to administer an oral liquid to her child, is not instructed on how to use the syringe. The child subsequently chokes when the syringe tip cap is ejected into her throat.
- A penicillin-allergic patient has an allergic reaction because his medication was counted on a tray that was not cleaned after counting amoxicillin.

Environmental Factors
- A pharmacist overlooks incorrect directions (once daily) on a prescription for DURAGESIC patches because she is focused on learning the new pharmacy computer system.
- A physician gives a verbal order for CELEBREX for pain while rushing between patients, but the nurse mishears it as CELEXA for depression and calls it into the pharmacy.

Staff Competency and Education
- Look-alike packaging contributes to many errors in an organization, but because errors are not a part of a staff education program in the organization, the same errors continue to occur.
- A newly hired physician’s office manager misunderstands her duties to “authorize prescription refills” and subsequently approves any refill request without first verifying it with the physician.

Patient Education
- A patient refuses to take a new prescription for amitriptyline because the patient information leaflet describes its use in the treatment of depression rather than neuropathic pain.
- A patient is noncompliant with his antihypertensives because he was not educated about the importance of taking the medication despite feeling well.

Quality Processes and Risk Management
- An employee conceals a medication error because of fear of losing his job.
- A long-term care patient received 10 mL of ROXANOL (morphine sulfate 20 mg/mL) instead of the prescribed 10 mg, after a nurse failed to get an independent, double-check of a high-alert medication from another practitioner.
knowledge and skills related to safe medication practices. In addition, education must be ongoing and focused in two areas: preventing medication errors and the safe use of drugs and devices that have the greatest potential to cause harm if misused.

**Patient Education**

The patient is the final link in the medication-use process. Health professionals who educate their patients and/or their caregivers play an important role in ensuring safe medication use. When patients and/or their caregivers are well informed about their medications (know the purpose of each medication, how to take it, what it looks like, how it works), they can serve as the last line of defense in preventing medication errors.

Information (both verbal and written) must be up-to-date, useful, and provided at a suitable reading level for the patient or caregiver. Whether they are limited by knowledge, socioeconomic factors, emotional or clinical state, or cultural background, their level of health literacy—the ability to read, understand, and act on health care information—is often much lower than many health care providers may appreciate. According to a report published by the American Medical Association Ad Hoc Committee on Health Literacy, more than 40% of patients with chronic illnesses are functionally illiterate, and almost a quarter of all adult Americans read at or below a fifth-grade level. Unfortunately, medical information leaflets typically are written at a tenth-grade reading level or above. People who have difficulty reading or understanding health information may be too embarrassed or ashamed to acknowledge their deficits. Instead, they refuse to ask questions and often pretend to understand instructions. In addition, low literacy is often not obvious. Further contributing to the dilemma is that an estimated 75% of patients throw out the medication leaflet stapled to the prescription bag without reading it, and only 50% of all patients take their medications as directed. When possible, patients and/or their caregivers must be encouraged to ask questions and seek satisfactory answers about their medications before they are dispensed or administered. In addition, all patient concerns (e.g., being able to afford their medications, interactions with over-the-counter medications, potential side effects) should be thoroughly investigated and questions answered before the medication is dispensed or administered.

Adherence is the second patient-related factor contributing to medication errors. One study found a 76% difference between medications patients actually are taking as compared with those recorded in their charts as being prescribed. Two factors most likely to contribute to this high rate of discrepancy: confusion that may accompany advancing age and an increase in the number of medicines prescribed for patients. Another study demonstrated that patient noncompliance played a role in 33% of hospital admissions. Noncompliance may be exhibited by patients in many ways, such as not having a prescription initially filled or refilled, omitting doses, taking the wrong dose, stopping a medication without the physician’s advice, taking a medica-
What Is ISMP?

The Institute for Safe Medication Practices (ISMP) is a nonprofit health care agency comprising pharmacists, nurses, and physicians. It was founded in 1994 to learn about—and prevent—medication errors, especially the system-based causes of these errors. The organization disseminates practical recommendations for health care providers, consumers, and the pharmaceutical industry.

A key element of its medication error-prevention efforts is a voluntary practitioner error-reporting program, helping the organization to learn about errors happening across the country, understand their causes, and share “lessons learned” with others in the health care community. Each year, its national Medication Errors Reporting Program, operated by the United States Pharmacopeia in cooperation with ISMP, receives hundreds of confidential error reports from health care professionals. ISMP publishes newsletters and other documents for both health professionals and consumers, and it conducts on-site risk assessments in health care facilities. ISMP also works directly and confidentially with the pharmaceutical industry to prevent errors that stem from confusing or misleading naming, labeling, packaging, and device design.

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Patients at risk for being noncompliant include patients:
- Taking more than one drug
- With a chronic condition who are on complex drug regimens that may result in bothersome side effects
- Who take a drug more than once daily
- Who have a condition that produces no overt symptoms or physical impairment, such as hypertension or diabetes.

In addition, the elderly patient is more at risk for drug-related problems such as noncompliance as a result of factors such as decrease in mental acuity and increased confusion, lack of family or caregiver support, decreased coordination and dexterity, and impaired vision.

The consultant pharmacist must consider these factors in the development of patient education tools, strategies, and methods, especially for the elderly population living in assisted living and other related facilities.

Quality Processes and Risk Management

A process to ensure a long-lasting reduction in the number of errors begins with an open, nonpunitive environment in which errors are freely discussed and system-based
changes are implemented. Efforts must be focused on redesigning the systems and processes in pharmacies and long-term care facilities that led to errors and not focus solely on the individual(s) who made the error. Effective strategies for reducing errors include implementing safeguards into the system that will make it difficult for staff to make an error. For example, add a system of independent double checks that promote the detection and correction of errors before they reach patients. For instance, dispensing pharmacists should compare the actual medication order with the computer-generated label and then compare the label and product with the original prescription before medications are dispensed.

When medications are dispensed on the basis of a computer-generated label instead of an original prescription, and the information entered into the computer was wrong, an error is inevitable. Nurses should be encouraged to compare the labeled medications with the medication name on the medication administration record before administering medications to residents.

To help redesign systems to promote safe performance, practitioners should be encouraged to report, analyze, and share errors that have occurred within the organization and to read about and discuss errors that have occurred in other organizations. It is critical that information about errors and their root causes be shared within your organization as well as with national reporting programs such as the Medication Errors Reporting Program, a joint effort of the U.S. Pharmacopeia and ISMP. Only then can appropriate analysis discover what latent failures exist and how errors can be prevented. An analysis must include the assumption that medication errors will occur and that the multifactorial nature of errors is system-based, not people-based. Where medication errors are concerned, the question of who was involved is less important than what went wrong, how it happened, and why it occurred.

**A Multidisciplinary Approach to Preventing Medication Errors**

A team approach is essential to problem solving and preventing medication errors. In a recent study examining error-reporting mechanisms in 18 skilled nursing facilities, only one facility reported using a team-based approach to preventing errors by examining the root cause of the error. The other skilled-nursing facilities focused on individual responsibility—their reporting forms did not even capture substantial information necessary to identifying root causes and improving systems. Furthermore, the definitions of medication errors provided by the nursing directors interviewed for the study focused on administration and transcription errors by nurses and excluded other professionals such as physicians. Clearly, this approach does not address the heart of the issue.

The first priority for successful error-reduction efforts lies in establishing a multidisciplinary, medication-use improvement team and providing the team with reasonable time and resources both to assess medication safety and implement system-level changes that make it difficult—or impossible—for practitioners to make mistakes that reach the patient. This multidisciplinary team should accept ownership of the
medication-use process and enthusiastically embrace the opportunity to improve medication safety.

The team should be established by the consultant pharmacist and comprise frontline practitioners—pharmacists, nurses, and prescribers—with intimate knowledge of medication-use processes. In addition, there should be a high-level representative, such as the director of nursing or someone from the facility’s administrative department, to provide support and encourage quick decision making. If possible, the team should include a physician champion to help promote medication safety initiatives.

The goals of the team should be to:

- Promote a nonpunitive approach to reducing medication errors
- Educate practitioners about the system-based causes of errors and their prevention
- Respond to potentially hazardous situations before errors occur
- Recommend ideas that facilitate organization-wide, system-based changes to prevent medication errors
- Learn from errors that occur in other organizations and take proactive measures to prevent similar errors

The multidisciplinary nature of the team significantly increases the success of efforts to reduce medication error. Effective results depend on looking at the complex medication-use process as a whole and understanding how major functions interact through varied perspectives and disciplines.

References