

# MEDICATION ERRORS AND FLORIDA REPORTING RULES

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### Topic Overview

Medication errors may occur at any time during the prescription, administration, and monitoring of a drug. These preventable events can harm a patient. The identification and prevention of medication errors require an understanding of the root causes of medication errors. Once root causes are identified, a pharmacist can implement procedures and protocols to reduce and prevent medication errors and promote patient safety. Pharmacists can work collaboratively with healthcare teams to reduce and prevent future medication errors.

### Accreditation Statement:



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**Universal Activity Number (UAN):** The ACPE Universal Activity Number assigned to this activity is **0669-0000-23-136-H05-P**.

**Credits:** 2 hours of continuing education credit

**Type of Activity:** Knowledge

**Media:** Internet/Home study

**Fee Information:** \$5.99

**Estimated time to complete activity:** 2 hours, including Course Test and course evaluation

**Release Date:** September 1, 2023      **Expiration Date:** September 1, 2024

**Target Audience:** This educational activity is for pharmacists.

**How to Earn Credit:** From September 1, 2023, through September 1, 2024, participants must:

- 1) Read the “learning objectives” and “author and planning team disclosures;”
- 2) Study the section entitled “educational activity;” and
- 3) Complete the Course Test and Evaluation form. The Course Test will be graded automatically. Following successful completion of the Course Test with a score of 70% or higher, a statement of participation will be made available immediately. (No partial credit will be given.)
- 4) Credit for this course will be uploaded to CPE Monitor®.

**Learning Objectives:** Upon completion of this educational activity, participants should be able to:  
for Pharmacists:

1. **Define** medication errors
2. **Discuss** the root causes of medication errors
3. **Describe** how to reduce and prevent medication errors
4. **Explain** how to respond to a medication error

### **Disclosures**

The following individuals were involved in developing this activity: Steven Malen, PharmD, MBA, and Pamela Sardo, PharmD, BS. Pamela Sardo was an employee of Rhythm Pharmaceuticals until March 2022 and has no conflicts of interest or relationships regarding the subject matter discussed. There are no financial relationships relevant to this activity to report or disclose by any of the individuals involved in the development of this activity.

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## Introduction

Medical errors are a significant problem in the healthcare system. One of the most pervasive medical errors responsible for considerable patient harm is medication errors. A medication error may occur at any point from prescription, administration, and through monitoring of a drug. Medication errors may be reduced or prevented with an understanding of the root causes of medication errors, followed by the implementation of policies, procedures, or systemic changes addressing these root causes, creating a safer healthcare system for patients.

### Medication Errors: Definition and Scope

Medication errors fall within the broader concept of medical errors. Over twenty years ago, medical errors were highlighted by the Institute of Medicine (IOM) in its seminal monograph, *To Err is Human: Building a Safer Health System*.<sup>1</sup> The Institute of Medicine (IOM) reported that 7% of all hospital admissions experience a serious medication error.<sup>1</sup> In the United States, 7,000 to 9,000 people die annually from medication errors.<sup>2</sup> The scope of the problem related to medication errors is further highlighted by the fact that the U.S. Food and Drug Administration (FDA) receives over 100,000 reports of suspected medication errors annually.<sup>3</sup> In addition to the human harm, medication errors exact an economic cost of about \$42 billion globally on an annual basis.<sup>2</sup>

A medication error is defined by the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) as “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.”<sup>4</sup> This means a medication error does not necessarily result in patient harm.<sup>4</sup> This point is emphasized in an alternative definition of a medication error that describes it as “any error in the process of ordering or delivering a medication regardless of whether an injury occurred or the potential for injury was present.”<sup>5</sup>

When a medication error results in patient harm, it is categorized as an adverse drug event (ADE).<sup>6</sup> An ADE is a broad term including medication *errors* resulting in harm and patient harm caused by an adverse drug reaction (ADR) when a drug was used as *intended*.<sup>6</sup> However, the terms ADE and ADR have often been used interchangeably, leading to confusion about their precise meanings.<sup>6</sup> While medication errors were called ADEs, ADRs were historically limited to events arising only from appropriate uses of medications. This distinction appears to have faded. By 2010, the term ADR had been expanded to include medication errors.<sup>7</sup> In today's literature, a medication error may be referred to as an ADE or ADR.<sup>6</sup>

An example of a medication error leading to an ADE or ADR is the case where a patient receives medication even though the patient has a known allergy to the medication. This error could occur because the allergy was not documented or a pharmacist and/or physician bypassed warnings about the allergy.<sup>7</sup>

Medication errors can be inconsequential, or have mild outcomes for a patient; however, medication errors may also have serious consequences that can include life-threatening medical conditions, hospitalization, and possibly disability or death.<sup>3</sup> When a medication error occurs with a pregnant patient, it may result in birth defects or other harm to the developing fetus.<sup>3</sup>

Given the potentially serious, negative outcomes that may result from medication errors, the healthcare industry has worked to reduce medication errors and create a safer healthcare system for patients and the public at large. This effort includes identifying the common types of medication errors, the root causes of medication errors, and systemic changes that can be used to address these root causes.

### **Types of Medication Errors**

The NCC MERP states that medication errors may arise within a professional practice, using health care products, and from health care procedures and systems. Medication errors may occur during prescribing,

order communication, transcribing, preparation, and administration, as well as dispensing and monitoring.<sup>4</sup> Additional events that may lead to medication errors are product labeling, packaging, nomenclature, compounding, distribution, education, and patient use.<sup>4</sup> Workflow issues and short staffing can also cause medication errors. The pharmacist and the entire pharmacy team should consider all these causes.

## **Prescribing Errors**

Prescribing errors represent a majority of medication errors.<sup>2,8,9</sup> A prescribing error pertains to the choice of a drug, involving a drug's indications, contraindications, and the patient's known allergies.<sup>10</sup> A patient's personal characteristics must always be considered. Additional factors involve "dose, concentration, drug regimen, pharmaceutical form, route of administration, duration of treatment, and instructions of use."<sup>10</sup> A medication prescription error may also include the failure to prescribe a drug for a patient needing the treatment for a medical condition or a patient needing the drug in the treatment of another drug's adverse effects.<sup>10</sup>

### Prescribing Potentially Inappropriate Medications in the Elderly

A prescribing error may include prescribing a medication potentially inappropriate for a certain patient population; specifically, the elderly.<sup>11</sup> In these situations, a medication may have adverse risks that exceed the health benefits to an elderly patient. There may also be safer or equally effective alternative medications that could be prescribed in their place.<sup>11</sup>

In 1991, Dr. Mark H. Beers developed the Beers Criteria.<sup>12</sup> The Beers Criteria guided the appropriate or inappropriate use of medications in geriatric patients.<sup>12</sup> The American Geriatric Society (AGS) is currently responsible for the regular updates of the Beers Criteria.<sup>11</sup>

The AGS criteria deal with prescribing drugs within the context of "consideration of diagnosis, use of caution, simultaneous prescription of drugs that could interact, and avoidance or reduction of dosage according to

individual kidney function.”<sup>11</sup> The updated Beers criteria, supported with a discussion of the quality of evidence and strength of each recommendation are available directly from the AGS.<sup>13</sup>

### Drug Not Indicated

A prescribing error includes drugs prescribed for a patient that are not indicated for the patient’s medical condition. One study found that an average of 2.7 medications per patient were not indicated for the patient given the patient’s diagnosis.<sup>10</sup>

### Drug–disease Contraindications

A medication error may result when a drug is contraindicated for a patient with a particular disease.<sup>10</sup>

### Drug-drug Interactions

A medication error may result when a patient is prescribed multiple drugs that may interact negatively.<sup>10</sup>

### Medication Consideration for Children

The age of a patient should always be verified and considered with prescriptions for children as they require extra caution. Doses for children are often smaller than doses for adults, with some requiring weight-based dosing for safe administration. Pediatric dosing should always be confirmed before processing prescriptions.

### **Transcription Errors**

Transcription errors occur because of poor communication. They typically do not occur because of a lack of knowledge.<sup>14</sup> With these errors, an order from a prescriber fails to be properly communicated to the individual dispensing or administering the medication.<sup>14</sup>

A transcription error may arise with both handwritten and verbal orders.<sup>14</sup> Handwritten prescriptions can cause issues if they are illegible.<sup>9,10</sup> “The process of transcribing a drug order manually from one sheet to another appears to be a significant source of error.” Over half of handwritten prescriptions have been reported to be “poorly readable or unreadable.”<sup>10</sup> Orders are more likely to be unclear or misinterpreted when the prescription is given verbally.<sup>14</sup> Verbal readback on telephone orders can significantly reduce misinterpreted orders. If a message is left on an answering machine and any part is unclear, the pharmacist should call the provider back to verify the information.

Electronic prescriptions have helped in this regard, but they have introduced their issues regarding prescription errors.<sup>15</sup> Prescription errors that persist even with electronic prescriptions are “wrong drug, wrong dose, wrong route, wrong duration, and wrong formulation.”<sup>2</sup> Drop-down lists can create an issue as it is easy for a provider to pick the wrong drug, dose, or instructions. If any part of an electronic prescription seems odd to the pharmacist, they should verify with the provider that the correct information has been submitted electronically. Pharmacists should always verify the date of birth for the patient on an electronic order, as well as be aware of alternate spellings of names and hyphenated names to ensure the prescription is being entered under the correct patient. The notes field of an electronic prescription should also be considered, as some electronic prescriptions indicate dosing changes and request previous prescriptions be discontinued. One solution is a verbal order read-back. When receiving a verbal medication order, read all verbal order information back and obtain confirmation that the order is correct.

## **Preparation and Administration Errors**

Preparation errors typically occur when a drug is improperly constituted or incorrectly concentrated.<sup>2</sup> Administration errors involve mistakes when giving medication to a patient. Examples of administration errors include missed, untimely or incorrect doses, unlicensed staff administering medication, wrong administration technique and rate, double dosing, and the

administration of an expired medication or the medication; administering a medication longer than recommended or not long enough.<sup>2,16,17</sup>

An administration error happens when clinicians fail to document or incorrectly document medication or fail to follow medication administration policies.<sup>18</sup> Questions are also being raised about the lack of patient education and informed consent of patients on medication risks and benefits.<sup>18</sup>

## **Dispensing and Monitoring Errors**

A dispensing error is multifactorial. It can pertain to dispensing medication to the wrong patient, giving the wrong medication to a patient, or giving medication at the wrong time. Pharmacists should never bypass allergy and interaction alerts without further investigating the patient's profile. Many dispensing errors can be avoided by preventative measures, including avoiding abbreviations, awareness of look-alike/sound-alike drugs, and verbal readback and confirmation of prescriptions and allergies when indicated. In a busy retail setting, errors can be reduced with appropriate staffing levels. When pharmacists are busy or rushing, errors are more likely to occur. Some examples of errors occurring when pharmacy staff members are rushed include wrong medications in the wrong bottles (especially if multiple medications are being dispensed to the same patient), allergies and interactions being bypassed, and technicians acting outside their scope of practice. If a prescription is received for an unfamiliar medication, pharmacists should always take the time to do appropriate research on the medication and its uses and contraindications.

The monitoring of medications establishes the effectiveness of treatment and the need to adjust doses.<sup>10,18</sup> Medication tolerance is an important consideration in monitoring treatment. Monitoring dosing, efficacy, and safety with high-risk medications like lithium, warfarin, and cardiac medications is important.<sup>19</sup> Some medications require routine laboratory monitoring of drug levels and the drug's effect on bodily functions (such as renal function).<sup>19</sup>



## **High-Alert Medications**

The Institute for Safe Medication Practices (ISMP) is a nonprofit organization that prevents medication errors.<sup>20</sup> The ISMP identifies medications posing a high risk of patient harm or death should a medication error occur.<sup>20</sup> These medications are not always associated with an increased number of medication errors, but significant harm may be caused if an error occurs with these medications. High-risk medications require frequent monitoring before refills are approved or before large supplies are filled. These drugs are identified in a list titled “High-Alert Medications in Acute Care Settings” and may be accessed on the ISMP website.<sup>20</sup> Examples of these medications include opioids, oral and injectable antithrombotics, concentrated injectable potassium, magnesium, and hypertonic sodium chloride for injection, pediatric medications, chemotherapy agents, HIV medications, immunosuppressants, and medications contraindicated in pregnancy.<sup>21,22</sup>

## **Root Causes of Medication Errors**

Human and systemic factors are root causes of medication errors. These include a lack of training or education of providers, unavailability of guidelines for medication administration, fragmentation of medication information, interruption during medication administration, poor communication between providers, and a failure to follow procedures in medication administration.<sup>18</sup> Many errors arise because of the time constraints when providing healthcare services.<sup>23</sup> Any of these can lead to medication errors that increase the risk of harm to patients, may extend a patient’s hospital stay, and may result in other negative outcomes.

### **Lack of Training or Education**

Clinicians, as professionals, and due to university curriculum or employment requirements, are required to maintain knowledge in their respective areas of practice and to complete continuing education for licensing and professional certification.<sup>24</sup> Lack of knowledge is a major cause of medication errors.<sup>25</sup> Lack of resources and/or time required for increasing

knowledge has been identified as a significant barrier to safe and appropriate healthcare.<sup>24,25</sup> Pharmacists may not receive the proper amount of on-site training due to time constraints and staffing shortages, which can result in errors and stressful environments for staff and patients.

### **Unavailability of Guidelines for Medication Administration**

Guidelines, whether clinical practice guidelines or computer systems with drug dosing guardrails are not always available. Guidelines for the administration of medications are not always available.<sup>24</sup> For example, medications may lack formal FDA approval for a specific population or may lack dosing information for a specific patient population, such as pediatrics.<sup>26</sup> Off-label uses may result in unguided drug administration that may result in administration errors.<sup>26</sup> For example, in one case, the computer system failed to alert a prescriber to an overdose of prednisolone (49.5mg instead of 15 mg).<sup>26</sup> In another case, the use of erythromycin was intended as an agent for gastrointestinal dysmotility (rather than as an antibiotic), which uses a lower dose.<sup>26</sup> Erythromycin was inappropriately prescribed at a higher dose, with an increased likelihood of gastrointestinal side effects.<sup>26</sup>

### **Interruptions**

Prescribing, transcribing, preparing, dispensing, or administering drugs requires a provider's undivided attention. Interruptions during these events can lead to medication errors.<sup>18</sup> Interruptions are common and, unfortunately, unavoidable in the pharmacy setting. A lack of appropriate staffing can lead to further interruptions as there are fewer people to allocate tasks to. In retail and hospital pharmacy settings, phone calls are a large source of interruptions. In the retail pharmacy setting, staff are subject to interruptions by patients who are at the location and waiting to drop off prescriptions, pick up prescriptions, or require counseling. Although not always favored by patients, it is advisable to indicate that current tasks must be completed before engaging with other tasks.

## **Fragmentation of Medication Information and Poor Communication**

The use of multiple medical specialists or medical systems to care for a patient has its benefits, but it can also increase the possibility a medication error may occur. A patient's health information does not always follow the patient from one provider, service, or level of care to the next provider, service, or level of care. Furthermore, fragmentation of medication information is implicated in other root causes of medication errors.<sup>27</sup> Fragmented medication information may result in poor communication.

Communication is important to the delivery of safe and appropriate healthcare services. Communication takes place among the different providers who may be involved in a patient's treatment.<sup>27</sup> Often, a patient's care is transferred from one provider to another. Poor communication inhibits the flow of information to the next provider, service, and level of care. This may cause harmful medication errors.<sup>27</sup> Medication reconciliation has become much more common and is discussed below as a strategy to mitigate the fragmentation of medical information.

Poor communication may also result from the use of non-standard abbreviations or because of sound-alike medications.<sup>14</sup> As noted above, this may lead to a transcription error.<sup>14</sup> Poor communication creates a greater risk that a medication error may occur, which may result in a poor outcome for the patient.<sup>27</sup>

## **Failure to Follow the Rights of Medication Administration**

The rights of medication administration are patient rights, required for safe medication ordering and use.<sup>18</sup> The rights of medication administration are enumerated and discussed below. A healthcare provider who does not utilize or follow these rights is more likely to make a medication error.<sup>18</sup>

## **Time Constraints**

Healthcare can occur at a rapid pace. Each day, healthcare clinicians may see a high volume of patients, and pharmacists may be filling a large number of prescriptions.<sup>23</sup> When a pharmacist works under time constraints, the pharmacist is driven or compelled to work quickly, perhaps too quickly. This increases the risk of a medication error.<sup>23</sup>

## **Medication Error Reduction Strategies**

The pharmacy team may implement several strategies to reduce medication errors. These strategies include the use of technology and continuing education. Pharmacists may also participate in patient education about medications.

Most healthcare facilities are computerized to help make the flow of information and the dispensing and administration of medications timelier and more accurate. Pharmacists should play a role in developing standardized medication use protocols. This may include the pharmacist working actively with healthcare facilities the pharmacist works for to help identify risks of medication errors at the facility and develop strategies to reduce these errors. Forms of active participation by a pharmacist may entail pharmacist-led educational and reconciliation programs. Pharmacists may also reduce medication errors through continuing education to fill their knowledge gaps, implementing pharmacy workflow strategies, use of the High-Alert Medications in Acute Care Settings provided by IMSP, and use of the Medication Error Reporting Program (MERP).

A pharmacist can help reduce medication errors by educating patients on medication errors. Patient education should also include a greater role for the pharmacist with a patient's over-the-counter (OTC) medications. Pharmacy technicians also play a major role in helping the pharmacist reduce errors. Pharmacists should regularly check in with their technicians to ensure the workflow is conducive to the environment, as technicians often have great suggestions and are aware of situations a pharmacist may overlook.

## **Standardized Medication Use Protocols**

The American Society of Health-System Pharmacists (ASHP) provides guidelines for preventing medication errors.<sup>28</sup> These guidelines begin with the recommendation that healthcare facilities do a risk assessment and, from that assessment, prepare a plan to reduce medication errors.<sup>28</sup> The ASHP guidelines focus on two factors: the identification of facility-specific, high-alert medications and risk reduction strategies for medication errors.<sup>28</sup> A list of high-alert medications may be reviewed from the ISMP list of high-alert drugs. The facility's medication use patterns and historical adverse events should also be considered.<sup>26</sup> Pharmacists who work with a hospital or healthcare facility should take an active role in this process.<sup>28</sup> An institution may have a medication use protocol for certain medications, such as warfarin or DOACs, or protocols for specific conditions, such as myocardial infarction.

The ISMP has published the Key Elements of Medication Use.<sup>29</sup> This document provides important information on the protocols to follow when medication is prescribed and administered. This information includes patient and drug information, as well as recommendations regarding the communication of drug information, drug labeling, packaging, nomenclature, and drug storage.<sup>29</sup> The ISMP's full recommendation is available online.<sup>29</sup>

## **Computerized Systems**

Computerized systems have been incorporated into the modern healthcare industry. One intention of these systems is to help reduce medication errors at various points in the process.<sup>14</sup> However, pharmacists should continue to be vigilant when checking electronic prescriptions as errors still occur, and this technology has introduced new types of errors, such as the entry of incorrect dosing directions, drug quantity, drug strength, or patient information.<sup>30</sup> Hincapie, *et al.* (2019) describe the potential magnitude of electronic prescription errors since over 1.74 billion prescriptions were submitted electronically in the United States in 2017.<sup>30</sup> Vigilance by pharmacists here is crucial for keeping patients safe.<sup>30</sup>

## Computerized Provider Order Entry Systems

Transcription errors occur because of poor communication between the prescriber and the provider dispensing or administering the drug. Handwritten errors and unclear or misinterpreted orders often interfere with the proper flow of information. Computerized provider order entry (CPOE) systems were developed to eliminate these errors through direct entry of the prescribing information into the CPOE system.<sup>14</sup> Utilizing these systems does help reduce human error resulting from verbal orders or handwritten orders, but problems may persist because of sound-alike medications, abbreviations, or computer drop-down menus of drug lists that can lead to clicking and selecting the incorrect agent.<sup>14</sup>

## Automated Dispensing Cabinets

Automated dispensing cabinets (ADCs) are devices storing and dispensing medications through a computerized system. These devices offer the pharmacist an opportunity to profile the patient and review medication orders before medication administration.<sup>14</sup> As with other computer systems, medication errors may still occur without proper attention.<sup>14</sup>

## Barcode Medication Administration Systems

Barcode medication administration systems place an identification number on each medication and patient unique to them.<sup>14</sup> "This allows for patient, medication, and employee identification codes to be scanned automatically to ensure that the right patient, drug, dose, route, and time are correct prior to administration."<sup>14</sup> Use of this technology has helped reduce administration errors.<sup>14</sup>

## **Education to Fill Knowledge Gaps**

Pharmacists have knowledge gaps. Knowledge is not static. Evidence-based medicine advances rapidly. Formal education is foundational in filling knowledge gaps.<sup>24,25</sup> An immediate need for information or solutions to

address medical dilemmas may occur. National databases like PubMed, clinicaltrials.gov, journals, conferences, quick-reference guides, mobile apps, or brochures<sup>14</sup> can be useful.<sup>14</sup> It is extremely important to become familiar with new medications and advances in diagnoses before dispensing to ensure patient safety and quality of care.

## **Pharmacy Workflow Strategies**

Pharmacy workflow strategies should be implemented. This involves reducing office clutter and limiting distractions when preparing prescriptions (e.g., answering questions, receiving or making phone calls, accessing the internet).<sup>31</sup> There are systems available that assist pharmacists with patient safety, such as “bar code” scanning, drug utilization review for each prescription, a two-step verification process, prescription post-fill auditing, and built-in technologies that provide alerts when medication may be incorrect.<sup>31</sup> It is imperative to work as a pharmacy team as sometimes workflow deficiencies can be identified by one person and not another. All members of the pharmacy team should feel valued in suggesting constructive criticism and improvement to workflow strategies to make for the safest and most pleasant work environment.

## **Pharmacist-led Educational Interventions**

Medication errors may be reduced by pharmacist-led educational interventions directed to healthcare providers.<sup>2</sup> Here, the pharmacist takes on the role of educator and provides medication information training. Examples of these educational programs include brochures or training activities presented by a pharmacist designed to improve the knowledge and skills of healthcare workers.<sup>2</sup> One study reported that a pharmacist-led educational program reduced the risk of a medication error by about 15.8%.<sup>16,32</sup> In this study, the pharmacist observed staff members of a provider administering a drug to a patient and then followed the observation with feedback and education regarding observed risks or errors.<sup>16,32</sup>

## Pharmacist-led Medication Reconciliation Programs

Medication reconciliation is a program where a healthcare provider reviews patient files to reconcile drug administration and find drug discrepancies and medication errors.<sup>33</sup> Pharmacist-led medication reconciliation may be particularly useful in reducing medication discrepancies when a patient's care is transitioning from one provider to another. Baalman, *et al.* (2023) wrote, "Pharmacist-led medication reconciliation has reduced health-system use and improved medication safety [and] teams with a pharmacist showed a significant reduction in the severity of medication errors."<sup>34</sup>

With pharmacist-led medication reconciliation, the pharmacist reviews the closed patient file from the prior provider and reconciles any drug discrepancies so they may be resolved and not repeated with the new provider.<sup>33,35</sup> This strategy can help avoid medication errors and prevent patient harm.<sup>33</sup> Another form of medication reconciliation takes place upon arrival to a facility, where a pharmacist or technician may make phone calls to outpatient pharmacies as well as previous and current providers to verify current medications and dosages the patient is taking.

One drawback of pharmacist-led medication reconciliation is that it may be time-consuming and costly.<sup>35</sup> One alternative would be to use computerized medication reconciliation to reduce prescribing errors, but some studies show that computerized medication reconciliation is not as effective as pharmacist-led medication reconciliation in reducing errors.<sup>35</sup> Because it is more effective, Manias, *et al.* (2020) believe the additional time and cost of pharmacist-led medication reconciliation is one solution.<sup>35</sup> Barriers to medication reconciliation include transcription errors, access to the records if retail pharmacies are not open, or if the databases are not complete, and time constraints.

One possible answer to time constraints may be the new technologies, *e.g.*, telehealth, and video conferencing. These new technologies provide virtual health care to patients in real time, with face-to-face interaction.<sup>34</sup>



Telehealth consultation also facilitates collaboration and communication among health professional team members, working together to develop a care plan for a patient,<sup>34</sup> and to gather medication information for reconciliation during the virtual interaction.

## “Rights” of Medication Administration

The causes of medication errors are complex; however, there are some basic, effective methods to avoid medication errors. One of these methods is the rights of medication administration.<sup>18,36</sup>

The rights of medication administration vary in the *number* of rights listed.<sup>18,36</sup> The basic list provides “five rights” that are required for safe medication ordering and use. A provider double-checks that the rights of medication administration have been met. The five rights are:<sup>36</sup>

1. The drug is being administered to the **right patient**
2. The **right drug** is being administered
3. The **right dose** is being administered
4. The drug is being administered at the **right time**
5. The drug is being administered via the **right route**

This list has been supplemented with additional “rights of medication administration” to make it more sensitive and effective at preventing medication errors.<sup>36</sup> In some settings, the list has expanded to 6 or even 10 rights.<sup>18</sup> For example, Schiff, *et al.* (2016) stated a sixth right must be added to each prescription: the **right indication**.<sup>37</sup> This sixth right is particularly important to pharmacists, especially with the computerization of medical records. Schiff, *et al.*, pointed out that with the addition of an “indications-based computer prescribing system,” pharmacists could more easily catch drug–indication mismatches.<sup>37</sup>

The list of rights of medication administration is a useful tool, but it should not be viewed as sufficient to address medication errors. Attention to the root causes of medication errors that are systemic should be continued,

and improvements should regularly be made.<sup>36</sup> In addition, cognitive and physical factors are not always solved with lists, especially in a fast-paced work environment.<sup>36</sup> Systems that use a pharmacist to check orders at multiple stages of input and dispensing can help check if “the rights of medication administration” are being followed.

## **High-Alert Medications in Acute Care Settings**

As mentioned above, the ISMP has identified medications posing a high risk of patient harm or death if a medication error occurs.<sup>20</sup> This list is entitled High-Alert Medications in Acute Care Settings.<sup>20</sup> This list was last updated in 2018.<sup>20</sup>

High-Alert drugs must be understood in the context of drug use. Drugs are prescribed to prevent or treat an illness and often provide a measurable effect. In order to avoid medication errors, clinicians should be aware of look-alike and sound-alike drugs and drug abbreviations. A significant number of medication errors that occur in the United States involve name confusion, and these errors have the potential to cause great harm.

## **Awareness of Error-Prone Abbreviations**

Regarding the proper use of abbreviations, each healthcare facility should have a list of acceptable abbreviations, and clinicians should know where the list is and what it contains. The ISMP provides a List of Error-Prone Abbreviations on its website.<sup>38</sup> Commonly used abbreviations that can be used mistakenly or misidentified are ones, such as U (or u), intended to mean unit but easily mistaken for a 0 or 4, SC intended to mean subcutaneous but easily mistaken for SL (sublingual), and QOD intended to mean every other day but easily mistaken as QD (every day) if written illegibly.<sup>37</sup> Although some prescribers still use abbreviations for drug names (e.g., MTX for methotrexate), they are not safe, and the order should be verified with the prescriber prior to dispensing.

## **Medication Errors Reporting Program (MERP)**

The Medication Errors Reporting Program (MERP) is a program provided by the United States Pharmacopeia (USP) and the Institute of Safe Medication Practices (ISMP). The MERP is a nationwide reporting system for actual or potential medication errors.<sup>39</sup> The MERP includes reports of drug misinterpretations, miscalculations, misadministration, illegible handwritten orders, or misunderstood verbal orders.<sup>39</sup> The USP reviews these reports, and the information is sent to the FDA and the drug or product manufacturer.<sup>39</sup> This provides an additional resource to providers to make them aware of actual or potential medication errors. Utilization of resources such as MERP can help reduce or prevent medication errors.

## **Patient Education**

Encourage dialogue by using open-ended questions to help educate the patient. Patients must be educated about the medications they are prescribed. This is usually conducted by pharmacists when patients are picking up a prescription from a community pharmacy, or a pharmacist may counsel a patient on medications before being discharged from a facility setting.<sup>28,29,35</sup> This education should include “the brand and generic names of medications they are receiving, their indications, usual and actual doses, expected and possible adverse effects, drug or food interactions, and how to protect themselves from errors.”<sup>29</sup> With education, a patient can play a vital role in preventing medication errors.<sup>29</sup> Medication errors can be identified during patient education and counseling. Sometimes when reviewing a medication with the patient, the indication, dosage, or even name of the medication may alert a patient to a potential medication error if the information does not match what the provider initially told them. Use the “talk back” approach for effective communication with patients to get them to repeat what you just taught them and to gauge what they remember. A pharmacist can also follow up with the provider to ensure the accuracy of the original prescription.

According to the FDA, patients, as consumers, should be educated by their physician or pharmacist on the following safety tips and questions. Consumers should ask their pharmacist if any of the following is unclear to them:<sup>3</sup>

- Know the various risks and causes of medication errors.
- Know the drug you are prescribed and what it is for. Ask your prescriber for the name of the drug and the purpose of the drug.
- Find out how to take the drug and understand the directions. Ask if the medication needs to be kept in the refrigerator.
- Check the container's label every time you take a drug. This is especially important if you take several drugs because it will lower your risk of accidentally taking the wrong medication.
- Keep medications stored in their original containers. Many tablets/capsules look alike, so keeping them in their original containers will help the patient know the name of the drug and how to take them. If you have trouble keeping multiple medications straight, ask your doctor or pharmacist about helpful aids.
- Keep an updated list of all medications taken for health reasons, including OTC drugs, supplements, medicinal herbs, and other substances. Give an updated copy of this list to your healthcare provider regularly.
- Be aware of the risk of drug-drug and food-drug interactions.
- If you are in doubt or have questions about your medication, ask your pharmacist.
- Report suspected medication errors to MedWatch (the FDA's "Safety Information and Adverse Event Reporting Program").

### **Pharmacist Involvement with Over-the-counter (OTC) Medications**

In the U.S., OTC medications are available to people without a prescription.<sup>40</sup> This poses a significant risk of drug interactions and medication errors that may lead to harm, especially in pediatric and elderly patients.<sup>40</sup> An estimated one-third of older adults reportedly use OTC drugs, and this percentage increases to one-half with people 75 to 85 years of age.<sup>40</sup> Some

older adults use two or more OTC drugs.<sup>40</sup> Gilson, *et al.* (2021) believe that “over one million older adults are in physical jeopardy from harms related to the use of 2 or more OTC medications.”<sup>40</sup>

Of the ten drugs most frequently used by the public, four are available OTC.<sup>41</sup> These four OTC drugs are ibuprofen, aspirin, acetaminophen, and diphenhydramine.<sup>41</sup> These drugs are also available in multiple-ingredient preparations, which increases the risk of a potentially dangerous overdose.<sup>41</sup> To address this serious problem, pharmacy aisles may be redesigned, and pharmacists can interact more with older adults or parents of young children regarding OTC drug purchases.<sup>40-42</sup> The redesign of store aisles and greater interaction with pharmacy staff are intended to decrease the potential misuse of these drugs and provide patients with more information and awareness about the possible dangers of OTC medication. Pharmacy staff members can observe individuals when they are purchasing OTC drugs and then engage in conversations with them and make recommendations.<sup>41</sup> One solution to reduce confusion about OTC products and confusing brand names is to specify ingredients instead of brand names when discussing the use of OTC products.

### **Reporting Medication Errors**

Under federal law, there are voluntary reporting systems for medication errors. For example, the FDA receives voluntary reports at the FDA Adverse Event Reporting System (FAERS).<sup>43</sup> Some states mandate reporting of medication errors by healthcare facilities, and hospitals and other institutions may have policies requiring their pharmacists to report medication errors.<sup>44,45</sup>

The term “medication errors” is broadly defined under the Florida Administrative Code.<sup>46,47</sup> If a medication error occurs, a licensed health care practitioner must notify a supervisor, if applicable, and for a wrong medication, wrong dosage, or wrong patient, a licensed health care practitioner must immediately notify the patient’s health care practitioner, and observe the patient closely for a minimum period of 60 minutes after the medication was administered, immediately reporting any observed changes in the patient’s condition to the prescribing health care practitioner. They must

call 911 to request emergency services if the patient exhibits respiratory difficulty or other potentially life-threatening symptoms.<sup>48</sup> If the error occurs in a healthcare facility, a report must be submitted to the Regional Office within 24 hours of discovering the error.<sup>49</sup>

A pharmacist may consult with a legal advisor, or, if employed, with the pharmacist's employer or supervisor, to determine the laws regarding medication errors in the state where the pharmacist is licensed. Even if a medication error is not required to be reported, such reports are useful because they enable practitioners to evaluate errors and make improvements. The medication error reduction strategies, discussed above, such as education, training, and changes in pharmacy policies, may then be implemented to prevent future occurrences. All pharmacy members should feel confident in identifying and reporting errors without fear of punishment.<sup>45,50</sup>

### **Disclosing Medication Errors to the Patient**

When a medication error does occur, the question arises when must or should a pharmacist disclose the error to the patient. Publications have revealed pharmacists who work within a hospital setting report that the number of weekly medication errors is higher than in a community setting.<sup>44</sup> Most pharmacists work in a hospital setting with mandatory error reporting requirements, but significantly less than half have a policy on error disclosure to the patient.<sup>44</sup> This may be due to the different reporting rules or policies that hospitals have implemented; namely, who is responsible for disclosure to the patient. According to Mazan, *et al.* (2020), most hospital pharmacists believe they are not responsible for disclosing a medication error.<sup>44</sup> Pharmacists outside the hospital setting reported a "higher awareness of guidelines on disclosure to patients, as they are more likely to be involved in the process."<sup>44</sup>

Mazan, *et al.*, propose that medication errors should be disclosed to the patient and family members when appropriate. While this may be difficult, it is "vital for the patient's physical and emotional wellbeing [and] the wellbeing

of healthcare systems, as acknowledging errors is the first step in correcting them."<sup>44</sup> A pharmacist should consult with their employer, supervisor, or legal advisor to determine their obligation to report a medication error to the patient.

Most states require the patient to be notified of an error.<sup>45</sup> Florida does not require that patients be notified when a medication error occurs in a pharmacy in all circumstances. If a practitioner learns that a medication error has occurred, the practitioner should immediately notify a supervisor. However, Florida Statute 456.0575 does require healthcare practitioners to notify patients of adverse events.<sup>51</sup> There are facility incident reports that have to be submitted to the Florida Department of Health (FDH).<sup>52</sup> These reports are based on incident reports submitted by employees on Initial Incident Report Form DH 1152. That being said, most companies have internal policies that require reporting a medication error not only to the patient but to the prescriber.

Suggestions for pharmacists to approach this difficult experience:

- Give the patient your immediate attention. Let other staff know you are involved in an important discussion, and you would appreciate their help covering operations during this time.
- Move to a private area if possible.
- Start by recognizing that the priority is to minimize any potential ill effects for the patient.
- Take all comments and questions regarding possible errors seriously.
- Acknowledge the concern that an error may have been made. Tell the patient that you will check into it thoroughly.
- Get the details of the situation by asking the patient important questions such as why they think an error occurred, whether the medication was taken, how much of the medication was taken, and how they are feeling.
- If it is a handwritten Rx, check the original prescription rather than the computerized version during the information-gathering process.
- If the patient is upset, allow them to vent. Listen attentively.

## Summary

A “medication error” has been identified by the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) as a preventable event involving inappropriate medication use which potentially may result in patient harm and an adverse drug event. The failure to communicate drug orders and illegible writing are among the more common failures related to medication errors. Name confusion over similarly named drugs or errors involving dosing units is also a common reason medication errors can occur. Medication errors can be due to human errors; however, more typically, a medication error results from a systemic failure, such as the fragmentation of medication information as a patient moves between providers, services, and levels of care.

Strategies a pharmacist may implement to reduce medication errors can include working actively with healthcare facilities to help them identify risks of medication errors at the facility and developing strategies to reduce these errors. This may include pharmacist-led educational interventions and pharmacist-led medication reconciliation programs. Pharmacists are an integral part of the healthcare team, and by working together with open communication on all fronts, medication errors can be greatly reduced or avoided.



## **Course Test**

### **1. A medication error is best defined as an event that**

- a. causes patient harm.
- b. is preventable and may cause harm.
- c. is caused by a healthcare provider, not a patient.
- d. must be disclosed to the patient and the patient's family.

### **2. A majority of medication errors are caused by**

- a. the use of over-the-counter medications.
- b. monitoring errors.
- c. the manufacturer's erroneous product labeling or packaging.
- d. prescription errors.

### **3. A medication error that results in harm to a patient is called**

- a. a contraindication.
- b. an adverse drug event.
- c. a near miss.
- d. a monitoring error.

### **4. The list of "High-Alert Medications in Acute Care Settings" identifies drugs that**

- a. carry a higher risk of harm when a medication error occurs.
- b. are more prone to medication errors.
- c. have the potential for medication errors.
- d. have actually caused medication errors.

### **5. One of the root causes of medication errors is the fragmentation of medication information that arises when a patient's medication information**

- a. is mixed with another patient's medication information.
- b. is not given to the patient.
- c. does not follow the patient from one provider, service, or level of care to another.
- d. is computerized.

**6. One strategy to reduce medication errors is a pharmacist-led medication reconciliation program in which the pharmacist**

- a. sits down with the patient and discloses medication errors.
- b. trains healthcare staff on medication errors.
- c. reviews closed patient files to find drug use discrepancies.
- d. reviews a patient's medication bills for errors.

**7. Examples of \_\_\_\_\_ include missed, untimely, or incorrect medication doses.**

- a. administration errors
- b. transcribing errors
- c. monitoring errors
- d. prescribing errors

**8. A pharmacist may respond to a medication error in all of the following ways except**

- a. if handwritten, check the original prescription
- b. minimize any potential ill effects on the patient
- c. do not tell anyone to avoid personal liability
- d. give the patient your immediate attention

**9. Barcode medication administration systems place an identification number on each**

- a. medication error so it may be tracked.
- b. medication and patient that is unique to them.
- c. prescription and any transcription to make sure they match.
- d. over-the-counter drug purchase.

**10. The sixth right in the list of rights of medication administration - the Right Indication - is of particular importance to pharmacists because it can help them**

- a. more easily catch drug-indication mismatches.
- b. drug-drug interactions.
- c. know if the drug dose was indicated correctly on the prescription.
- d. identify the correct route of administration.

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