The Impact, Prevention and Reporting of Health Care and Medication Errors

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Target Audience
This continuing education activity was developed specifically for pharmacy technicians.

Disclosure Statement
The author has indicated that she does not have any conflicts of interest, nor does she have financial relationships with a commercial interest, related to this activity.

Learning Objectives
At the end of this activity, participants should be able to:

- describe the importance of avoiding health care-associated and medication errors.
- define various types of health care-associated errors and medication errors.
- recall the eight “rights” of medication administration to help avoid errors.

The advancements in medications and medical care have been dramatic in the past few decades. However, despite these advances, humans continue to make mistakes. Some believe that the biggest mistake in making an error is not investigating and analyzing the error, so that others may learn from it. In his famous TED® Talk, Dr. Brian Goldman mentioned that he expected to be immunized against making errors, because he studied, knew everything, and graduated from medical school with honors. As he learned, this was not the case. Health care providers must learn from past mistakes, knowing that mistakes will happen again. The potential for errors in the future can be minimized with open conversations involving each member of the health care team. Further, as stated in the 1999 Institute of Medicine (IOM) report To Err is Human: Building a Safer Health System, “we must not focus on the individuals that are making these errors, but instead the flaws in the healthcare system that allow for errors to occur.” The potential for errors can also be reduced by evaluating the processes used to provide patient care, rather than blaming individuals who commit an error. This article will give a brief summary of the IOM reports, describe the importance of preventing health care errors, define the types of health care errors, discuss contributing factors that lead to errors, and share information on how to avoid and report health care errors.

Introduction
Mitigating and preventing health care errors are important for two main reasons: safety and cost. Safety is likely the most influential and ethically important reason to avoid health care errors. Safety is not only a concern for patients; one’s own safety (as a pharmacy technician) and the safety of coworkers are also of concern. For example, appropriately collecting and documenting medication allergies a patient may have will keep them safe by avoiding exposure to offending medications. A 2013 review estimated that there are between 210,000 and 400,000 deaths per year associated with preventable deaths in hospitals. In addition, a pharmacy technician must also properly handle hazardous medications to keep oneself safe and avoid causing harm to their colleagues.

Health care and medication errors are also costly, to individuals and to society as a whole. Health care errors that cause adverse events and/or patient harm (temporary or permanent) can increase the patient’s medical cost dramatically. Some errors may even affect the ability for a patient to work, leading to lost wages. In 2011, it was estimated that between $15 billion and $28 billion in avoidable cost due to medication errors, which were responsible for approximately 4 million avoidable hospital admissions. Identifying and establishing ways to prevent errors is important.

To Err is Human defines safety as a “freedom from accidental injury,” and characterizes errors as either “errors in planning” or “errors of execution.” Planning errors involve the use of the wrong method or plan to achieve the intended goal or outcome. Errors of execution result from a planned action
that is not completed as intended. There are two types of execution errors: errors of omission and errors of commission. An omission error is unintentionally not doing the right thing, and a commission error is unintentionally doing the wrong thing. The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) defines medication errors 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.” It goes on to state that “Such events may be related to professional practice; health care products; procedures and systems, including prescribing; order communication; product labeling, packaging and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.” The NCC MERP recommends that researchers, software developers and institutions use this standard definition to identify and categorize medication errors. Appendices A and B illustrate NCC MERP’s recommendations.

Errors can occur at any point in the health care process, including, but not limited to health information collection and communication, diagnosis, treatment and prevention. Similarly, medication errors can occur at any point in the medication use process, including administration, prescribing, dispensing and monitoring. Table 1 provides examples of where errors can occur. In a review article published in 2013, it was estimated that there are between 210,000 and 400,000 preventable deaths per year in hospitals, and 10-20 times more events that cause serious harm. These figures are staggering, and every member of a health care team must continue to work diligently to keep patients safe.

### Table 1. Types of Health Care Errors

<table>
<thead>
<tr>
<th>Health Information Collection</th>
<th>Incomplete or inaccurate list of allergic reactions</th>
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<tbody>
<tr>
<td></td>
<td>Incomplete or inaccurate medication lists</td>
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<tr>
<td></td>
<td>Incomplete or inaccurate past medical history list</td>
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<tr>
<td>Diagnostic</td>
<td>Incorrect or delayed diagnosis</td>
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<td></td>
<td>Not utilizing indicated tests</td>
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<td></td>
<td>Use of outdated tests, therapy or guidelines</td>
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<tr>
<td></td>
<td>Results of monitoring or testing are not utilized properly</td>
</tr>
<tr>
<td>Treatment</td>
<td>Incomplete or inaccurate performance of an operation, procedure or test</td>
</tr>
<tr>
<td></td>
<td>Incomplete or inaccurate administration of the treatment</td>
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<tr>
<td></td>
<td>Incomplete or inaccurate dose or method of using a drug</td>
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<td></td>
<td>Delay in response to an abnormal test or treatment</td>
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<td></td>
<td>Defect in medication, device or test</td>
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<td></td>
<td>Inappropriate (not indicated) care or misuse of treatment guidelines</td>
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<tr>
<td>Preventative</td>
<td>Prophylactic treatment is not utilized</td>
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<tr>
<td></td>
<td>Incomplete or absence of monitoring or follow-up to treatment</td>
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<tr>
<td>Other</td>
<td>Communication barriers or absence of communication</td>
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<tr>
<td></td>
<td>Equipment failure or system failure</td>
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</table>

**Investigating Medication Errors**

As pointed out previously, anyone can make a mistake. When an error occurs, the investigation into the error should not focus on the individual who committed the error; instead, it should seek to identify the failure in the system as a whole that allowed for the error to reach the patient. On the other hand, it is equally as important to address errors that have not reached a patient, but might in the future. The components of a system, in this case a health care system, can be described using James Reason’s
“Swiss Cheese Model.” Each slice represents a person, a group of people with a common responsibility, or even a computer system or robot. The wholes of the cheese symbolize the areas of weakness that an error or hazard may be able to penetrate. If the error or hazard is able to simultaneously make it through various flaws (i.e., holes in each of the system components), it will have the potential to cause harm to a patient. To better visualize this, see Figure 3. The more we analyze the flaws in a system, the more likely we are to eliminate or shrink the holes and avoid future adverse events.

**Figure 3. Swiss Cheese Model**

In Table 1, it is noted that an error in treatment can occur when there are defects in the performance of a medication, device or test due to an error in the manufacturing process. Pharmaceutical companies are not required, by law, to recall a drug product if the integrity of the product has been compromised. However, the U.S. Food and Drug Administration (FDA) will receive reports from healthcare professionals and consumers about the faulty product. When this happens, the FDA will advise or force (under statutory authority) the manufacturer to announce a recall. If the manufacturer fails to take action, the FDA will take action to make sure the defective product is no longer available to consumers. There are three classes of recalls, with Class I being the most likely to cause patient harm and Class III the least likely to cause patient harm. It is critical for pharmacy technicians to stay up to date on recall announcements and to remove any recalled medications from stock. Table 2 provides the FDA definition of each class. A list of current and past recall actions are available on the Drug Safety page of the FDA Web site.

**Table 2. FDA Recall Class Definitions**

<table>
<thead>
<tr>
<th>Class</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Class I</td>
<td>A situation in which there is a reasonable probability that the use of or exposure to a violative product will cause serious adverse health consequences or death.</td>
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<tr>
<td>Class II</td>
<td>A situation in which use of or exposure to a violative product may cause temporary or medically reversible adverse health consequences or where the probability of serious adverse health consequences is remote</td>
</tr>
<tr>
<td>Class III</td>
<td>A situation in which use of or exposure to a violative product is not likely to cause adverse health consequences.</td>
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Medication Error Resources

Once a safe and effective medication is stocked on the pharmacy shelf, pharmacy technicians, pharmacists, nurses and other health care professionals have the duty to follow the eight “rights” of medication administration. The eight “rights” have been used for years as a teaching tool for many health care providers to help remember the areas in which medication errors may occur. They include the following:

- Selecting the right drug
- Selecting the right patient
- Selecting the right dose
- Selecting the right time
- Selecting the right route
- Selecting the right reason
- Selecting the right response
- Selecting the right documentation.\(^{11}\)

Along with the “eight rights,” there are many other resources available to help mitigate medication errors. The Institute for Safe Medication Practices’ (ISMP) Web site publishes free safety newsletters for several different practice areas, including acute care, community/ambulatory care, nursing and long-term care.\(^ {12}\) The ISMP also provides webinars and additional education programs. Viewable on the Web site homepage are helpful lists such as error-prone abbreviations, a list of confusing drug names and a list of medications that should not be crushed.\(^ {12}\) These tables are updated on a regular basis by the ISMP. In addition, with the increased use of electronic medical records and electronic prescribing, the ISMP and the FDA have compiled a list of look-alike drug names and recommended the use of tall-man lettering when using these medication names in practice.\(^ {12}\)

As a member of the health care team, it is important for pharmacy technicians to utilize error-preventing resources, like those found within ISMP.\(^ {12}\) However, these are not the only resources available that help decrease medication errors. An example would be an institutional patient safety taskforce or committee that meets regularly to update resources and training aids, and to personalize these resources to better suit their setting. In addition, pharmacy technicians may utilize a barcoding system, as many hospitals are turning to patient-specific barcoding to ensure medications are delivered and administered to the correct patient. Pharmacy technicians will have to scan the UPC or type in the National Drug Code to ensure that the correct drug and strength are selected prior to dispensing. Another way hospitals and pharmacies can minimize errors is through the use translators. Many health care errors have the potential to be made if there is a barrier in communication. Communication barriers not only include foreign languages, but also communicating to the deaf, blind or mentally disabled. Therefore, it is essential to have a properly trained translator interpret information from the patient, and even back to the patient.

Pharmacy technicians should know what services and resources their health care system offers to minimize the occurrence of errors. Technicians must also do their part to remain alert and attentive to their daily duties. Fatigue among health care workers is a common topic of discussion among patient safety experts. Fatigue can be caused by many different factors, but obtaining an adequate amount of sleep seems to be the largest contributor. Sleep debt is defined as getting two to three hours less sleep than what is optimal.\(^ {13}\) Sleep experts generally agree that adults should get 6-10 hours (most need 8 hours) of sleep within a 24-hour period.\(^ {13}\) When sleep debt continues for a week or two, cognitive performance and response time becomes notably worse.\(^ {13}\) A study of anesthesiologists found that 11 percent of medication errors were due to fatigue, 27 percent from distraction, 39 percent from haste and 37 percent from inattention.\(^ {14}\) In addition to fatigue, other mental health states can affect alertness and attention to details. A survey of 123 medical residents found that those who were depressed were six times more likely to make a medical error.\(^ {15}\) As a responsible member of the health care team, it is important for pharmacy technicians to seek counseling or medical advice if they are experiencing depression or have other mental health concerns.
Reporting Medication Errors

In the event that a medication error or adverse event occurs, it is important to make sure that proper steps are taken to report the event. Each hospital, health system or pharmacy may have their own unique way of reporting these events, and it is important as a pharmacy technician to become familiar with this process. Adverse events meeting specific criteria should be reported to the FDA via the MedWatch program or to the ISMP National Medication Errors Reporting Program (ISMP MERP). MedWatch error reporting forms can be found on the FDA Web site or the ISMP Web site.\(^{16,17}\) The form can either be submitted electronically or one can be printed and faxed. It is also important to note that there are three areas of medication event reporting that should not be submitted through MedWatch. These include vaccine error reporting, veterinary medicine product reporting and suspected unlawful sales of medical products through the Internet.\(^{16}\) Vaccine error and adverse event reporting should be completed through a separate system called the Vaccine Adverse Event Reporting System.\(^{17,18}\) Through the FDA Web site, there is also the option to receive MedWatch alerts through e-mail, Twitter or a RSS feed.

Conclusion

In summary, pharmacy technicians can play a major role in keeping patients safe from harmful errors and reduce health care costs associated with those errors. It is important for pharmacy technicians to stay up-to-date on ISMP safety alerts and FDA medication recalls. In addition, they should know how to find and utilize resources within their institution and company and also from other organizations such as ISMP or the FDA. Technicians may be required to complete and send in a MedWatch form after an error has occurred. Therefore, they should become familiar with the form and what types of errors get reported to MedWatch compared to other reporting systems. Health care errors, including medication errors, can be physically and/or financially detrimental to the patient and to society. Pharmacy technicians play a very important role in patient safety and it is important for technicians to know how they mitigate errors.
Appendix A. NCC MERP Index for Categorizing Medication Errors

NCC MERP Index for Categorizing Medication Errors

- **Category A**: An error occurred that may have contributed to or resulted in the patient's death.
- **Category B**: Circumstances or events that leave the capacity to cause error.
- **Category C**: An error occurred but the error did not reach the patient. (An “error of omission” does not reach the patient).
- **Category D**: An error occurred that reached the patient but did not cause patient harm.
- **Category E**: An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention.
- **Category F**: An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention.
- **Category G**: An error occurred that required intervention necessary to sustain life.
- **Category H**: An error occurred that may have contributed to or resulted in permanent patient harm.

Definitions:

- **Harm**: Impairment of the physical, emotional, or psychological function or structure of the body and/or pain resulting therefrom.
- **Monitoring**: To observe or record relevant physiological or psychological signs.
- **Intervention**: May include change in therapy or active medical/surgical treatment.
- **Necessary to Sustain Life**: Includes cardiovascular and respiratory support (e.g., CPR, defibrillation, intubation, etc.)

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Appendix B. NCC MERP Index for Categorizing Medication Errors Algorithm

Circumstances or events that have the capacity to cause error:

Did an actual error occur?

Category A

Did the error reach the patient? *

Category B

Did the error contribute to or result in patient death?

Category C

Was intervention to preclude harm or extra monitoring required?

Category D

Was the patient harmed?

Category E

Did the error require an intervention necessary to sustain life?

Category F

Was the harm temporary?

Category G

Was the harm permanent?

Category H

NCC MERP Index for Categorizing Medication Errors Algorithm

Harm
Impairment of the physical, emotional, or psychological function or structure of the body and/or pain resulting therefrom.

Monitoring
To observe or record relevant physiological or psychological signs.

Intervention
May include change in therapy or active medical/surgical treatment.

Intervention Necessary to Sustain Life
Includes cardiovascular and respiratory support (e.g., CPR, defibrillation, intubation, etc.)

* An error of omission does reach the patient.
Continuing Education Self-Assessment Questions

1. Which of the following is an important reason to avoid health care errors?
   a. Patient safety and cost to the individual
   b. Your safety and the overall cost of health care
   c. Safety, including patient safety, your safety and the safety of those around you, as well as cost to the individual and society as a whole
   d. Safety only; cost does not play a role in the importance of avoiding errors.

2. Health care errors can occur during which stage of the health care process?
   a. Prevention
   b. Communication
   c. Treatment
   d. Diagnosis
   e. All of the above

3. Which of the following statements about medication recalls is true?
   a. Class III recalls are the most severe.
   b. Class I recalls will cause temporary harm to the consumer.
   c. Class I recalls are likely to cause serious adverse health consequences or death.
   d. Class II recall products can remain on the pharmacy shelf.

4. Which scenario should be reported to the FDA MedWatch program?
   a. You are practicing as a pharmacy technician in an emergency department and a patient presents with anaphylaxis after taking the first dose of an antibiotic.
   b. RP is a 10-year-old male who has arrived back at home after receiving a vaccine from his local pharmacy. The mother is calling to report that he is experiencing a widespread rash that is now covering the majority of his body.
   c. A friend is telling you about a Web site he found that may be illegally selling prescription medications.
   d. You are practicing in a community pharmacy and a patient, who picked up a prescription earlier for her dog, is calling because her dog experienced a seizure after taking the medication.
References: