

Medication Safety Management:

When an Ounce of Prevention is Worth **More** Than a Pound of Cure

by

Hilary Anderson, Shannon Mommsen, Sara Khan, Abir O. Kanaan, Karyn Sullivan, and Paul Belliveau

School of Pharmacy – Worcester

MCPHS University, Worcester, MA



Introduction

Learning Objectives

Upon successful completion of this case study, you should be able to:

- Define *medication error* and *adverse drug reaction (ADR)*.
- Explain why some medications are categorized as high-alert medications.
- List examples of high-alert medications.
- Identify patient or care-giver counseling points for patients prescribed high-alert medications.
- Identify possible contributing factors leading to a medication error and solutions to prevent medication errors upon hospital discharge.
- Identify adverse drug event types when presented with a patient case scenario.
- Categorize a medication error event based on the NCC MERP index categories.
- Describe the steps of a root cause analysis (RCA) to determine the root cause(s) of a medication event.
- Describe the benefits of having a “just culture,” or safety culture, in a hospital setting.
- Describe the Swiss cheese model as it relates to system safeguards meant to prevent medication events.
- Identify near-miss events and opportunities to improve the healthcare system.
- Describe the importance of reporting near-miss events.

Readings

The following should be read before beginning this case study. These readings, together with the additional supporting references following each section of the case, will help you to answer the case questions.

- National Coordinating Council for Medication Error Reporting and Prevention (NCCM ERP). (2022). NCC MERP index for categorizing medication errors. <<https://www.nccmerp.org/sites/default/files/index-color-2021-draft-change-10-2022.pdf>>
- National Coordinating Council for Medication Error Reporting and Prevention (NCCM ERP). (2001). NCC MERP index for categorizing medication errors algorithm. <<https://www.nccmerp.org/sites/default/files/algorBW2001-06-12.pdf>>
- American Society for Quality. (n.d.). What is root cause analysis (RCA) [webpage]? <<https://asq.org/quality-resources/root-cause-analysis>>
- AHRQ Patient Safety Network (PSNet). (2019). Root cause analysis [webpage]. <<https://psnet.ahrq.gov/primer/root-cause-analysis>>
- Boysen, P.G. (2013). Just culture: a foundation for balanced accountability and patient safety. *The Ochsner Journal* 13(3): 400–6.
- Douros, C.J. (2019). Was that a good catch or a near miss? Why the answer matters [webpage]. ProAct Safety. <<https://proactsafety.com/articles/was-that-a-good-catch-or-a-near-miss-why-the-answer-matters>>
- Reason, J. (2000). Human error: models and management. *The BMJ* 320(7237): 768–70. <<https://doi.org/10.1136/bmj.320.7237.768>>

Part I – Discharge Counseling Omission

A.Y., a 55-year-old female, arrived at the emergency department (ED) at 1:00 a.m. with a chief complaint of nausea. She also reported blurry vision that had been getting worse since the previous day. A.Y. had a history of type 2 diabetes for 10 years, hypertension, and hypothyroidism. When the physician asked about her abdominal pain and timing of her last full meal, the patient seemed confused and unable to recall information. Review of her medical records revealed that she was last admitted to the ED two weeks prior with similar symptoms. At that time, she had been diagnosed with diabetic ketoacidosis (DKA) and required a two-day hospital admission. Based on the hospitalization discharge medication list at that time, A.Y. was prescribed a new medication of long-acting insulin in addition to continuing her home medications.

While in the ED, the pharmacist reviewed the patient's current medication list and confirmed the information with her family. When reconciling her previous hospitalization discharge medication list and her current medication list, the pharmacist noticed that the newly prescribed long-acting insulin was missing. The pharmacist verified with A.Y.'s pharmacy that a long-acting insulin was not on the patient's profile.

The pharmacist informed the physician of the error and recommended a long-acting insulin.

Recommended Resources

- Gaunt, M.J. (2012). High-alert medications for community/ambulatory health care [webpage]. Pharmacy Times. <<https://www.pharmacytimes.com/view/high-alert-medications-for-communityambulatory-health-care->>
- Institute for Safe Medication Practices (ISMP). (2011). ISMP list of high-alert medications in community/ambulatory healthcare. <<https://www.ismp.org/sites/default/files/attachments/2017-11/highAlert-community.pdf>>

Questions

1. Describe factors that can contribute to discharge medication list errors as observed with A.Y.'s previous admission and subsequent discharge.
2. Describe ways to prevent prescription errors upon discharge.
3. Why are some medications categorized as high-alert medications?
4. List examples of high-alert medications and counseling points that can be provided for patients who are prescribed these medication on discharge.

Part II – Failure of Admission Care Transition

One year later, A.Y. was readmitted to the hospital. During medication reconciliation, it was determined that the patient had been prescribed 20 units of long-acting insulin at bedtime. In addition, the patient had an insulin sliding scale; however, the specific blood sugar ranges/parameters and insulin doses were not recorded for the patient's home sliding scale.

Upon admission, the provider ordered 20 units of long-acting insulin at bedtime along with the hospital standard protocol insulin sliding scale (rapid-acting insulin). The hospital standard insulin sliding scale had a dose of 5 units of rapid-acting insulin for a fingerstick blood sugar (FSBS) of 350–399 mg/dL. For any FSBS greater than 400 mg/dL, the provider was to be notified to order the dose of insulin.

At 8:00 a.m. on the second day of admission, the nurse noted that the patient's FSBS was 550 mg/dL, and the nurse called the provider to determine the insulin dose that should be administered. The provider ordered 12 units of rapid-acting insulin, which was administered at 9:00 a.m.

At 11:00 a.m., the patient reported feeling unusually hungry, and the nurse noticed that the patient was sweating and had a slight tremor. The nurse noted that patient's FSBS was 45 mg/dL. Shortly after, the patient became drowsy, lethargic, and started to have syncopal episodes. A rapid response was called by the nurse. The patient was treated for severe hypoglycemia. Fifteen minutes later, the patient began to feel better. The patient's blood sugar was tested again, and the FSBS was 125 mg/dL. The patient was then given lunch in order to reduce the risk of hypoglycemia.

Later that same day, the details of the patient's home insulin sliding scale for rapid-acting insulin were discovered. The patient's home dose for a FSBS of 350–399 mg/dL was 3 units of rapid-acting insulin. The dose for a FSBS of greater than 400 mg/dL was 5 units of rapid-acting insulin. The provider changed the order for the sliding scale to match the patient's home insulin sliding scale. The patient did not have any further hypoglycemic events during this hospitalization.

Recommended Resources

- MedlinePlus. (n.d.). Hypoglycemia [webpage]. U.S. National Library of Medicine. <<https://medlineplus.gov/hypoglycemia.html>>
- National Coordinating Council for Medication Error Reporting and Prevention (NCCM ERP). (2022). About medication errors: what is a medication error [webpage]? <<https://www.nccmerp.org/about-medication-errors>>
- National Coordinating Council for Medication Error Reporting and Prevention (NCCM ERP). (2022). NCC MERP index for categorizing medication errors. <<https://www.nccmerp.org/sites/default/files/index-color-2021-draft-change-10-2022.pdf>>
- National Coordinating Council for Medication Error Reporting and Prevention (NCCM ERP). (2001). NCC MERP index for categorizing medication errors algorithm. <<https://www.nccmerp.org/sites/default/files/algorBW2001-06-12.pdf>>

Questions

1. What is the difference between an adverse drug event (ADE) and an adverse drug reaction (ADR)?
2. What are the possible contributing factors for this error during A.Y.'s admission?
3. What are ways to prevent errors for home medications that are continued upon admission?
4. According to the NCC MERP index for categorizing medication errors, what category would you use to describe this hypoglycemic event? Explain your answer.

Part III – Root Cause Analysis

The nurse manager on A.Y.'s unit reported the patient's hypoglycemic event into the hospital's medication error reporting system. Because a high-alert medication was involved, the quality and risk manager reviewing the incident performed a root cause analysis (RCA) to discover the root cause(s) of the medication event and to prevent similar incidents from happening. The manager gathered a group of individuals who represented different aspects of the medication use process to perform the RCA. This group consisted of representatives from medicine, nursing, pharmacy, and informatics.

The quality and risk manager reviewed why and how an RCA is performed and gave a brief background of the incident. Different members of the group presented information on the incident from their discipline's perspective. The information was organized using a flow chart to determine the sequence of events. An RCA worksheet was used to ensure that all pertinent information was collected.

The group found that the specific blood sugar ranges and insulin doses were not recorded for the patient's home sliding scale. The missing information was not highlighted or marked for follow-up nor was it communicated when shift handoffs were taking place. The group discovered that the pharmacists had access to insurance claims history in the patient's medical chart, which shows patient's prescription filling history in the pharmacy. However, this information was not available to other team members. The root cause was determined to be an incomplete medication reconciliation.

After discussion, corrective actions were put in place. First, the providers and nurses created a standardized format for handing off patients during shift changes, including a section on unresolved issues for the next team that would care for the patient. Second, the informatics team helped enable insurance claim history access to all members of the patient's healthcare team, while the pharmacists created a quick education session on how to use that information in medication reconciliation. The group also scheduled a follow-up session to review the implementation of their corrective actions.

Recommended Resources

- American Society for Quality. (n.d.). What is root cause analysis (RCA) [webpage]? <<https://asq.org/quality-resources/root-cause-analysis>>
- AHRQ Patient Safety Network (PSNet). (2019). Root cause analysis [webpage]. <<https://psnet.ahrq.gov/primer/root-cause-analysis>>
- Boysen, P.G. (2013). Just culture: a foundation for balanced accountability and patient safety. *The Ochsner Journal* 13(3): 400–6.

Questions

1. What is a root cause analysis (RCA)?
2. What are the steps of an RCA? What tools are used to create an RCA?
3. What additional information would be necessary in order to complete an RCA for this hypoglycemic event?
4. What are the characteristics of a “just culture” in a hospital? Why is it important to have a just culture in a hospital?

Part IV – A Near Miss

On Day 3 of her admission, A.Y. was scheduled for surgery and subsequently was made NPO (nothing by mouth except for medications) after midnight before her surgery.

In the morning on surgery day, the nurse prepared the patient's medications for administration. The patient's profile showed that rapid-acting insulin, dose based on the sliding scale, should be administered within 15 minutes of a meal. The patient had a FSBS of 144 mg/dL, so the nurse prepared the rapid-acting insulin dose of 2 units and labeled the insulin syringe. Because insulin is a high-alert medication, a second nurse was required to sign off prior to administration. Just before administering the insulin, the second nurse noticed that the patient was NPO. The nurses therefore did not administer the insulin since the patient was not eating.

Recommended Resources

- National Coordinating Council for Medication Error Reporting and Prevention (NCCM ERP). (2022). NCCM ERP index for categorizing medication errors. <<https://www.nccmerp.org/sites/default/files/index-color-2021-draft-change-10-2022.pdf>>
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- Douros, C.J. (2019). Was that a good catch or a near miss? Why the answer matters [webpage]. ProAct Safety. <<https://proactsafety.com/articles/was-that-a-good-catch-or-a-near-miss-why-the-answer-matters>>
- Reason, J. (2000). Human error: models and management. *The BMJ* 320(7237): 768–70. <<https://doi.org/10.1136/bmj.320.7237.768>>

Questions

1. What is the definition of a “near miss” or “great catch” as related to medication safety?
2. What is the Swiss cheese model in the context of medication safety?
3. What are some possible corrective actions that could be implemented as a result of this event being reported?
4. According to the NCCM ERP index for categorizing medication errors, what category would you use to describe this event? Explain your answer.