Preventing Chemotherapy Errors
With Comprehensive Medication Assessment

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Preventing medication and chemotherapy errors is a priority in oncology nursing. In this article, a case is presented detailing a medication error that occurred because of inadequate assessment. Such errors still can occur despite electronic systems designed to increase medication administration safety. The authors will discuss implications for oncology nurses.

At a Glance
• Chemotherapy errors can occur if the American Society of Clinical Oncology and Oncology Nursing Society chemotherapy administration guidelines are not practiced consistently.
• Failure to observe the 10 principles of medication administration contributes to chemotherapy errors.
• Electronic safeguards may not prevent chemotherapy errors.

A short while later, her nurse withdrew from the unit’s automated medication distribution machine and proceeded to administer M.E.’s medications. At this time, the patient did not question any of the drugs the nurse administered. Those medications included hydroxyurea (Hydrea®), an oral antineoplastic medication that was prescribed to be taken once per day at bedtime. About 15 minutes after the RN administered the medications, including the 500 mg of hydroxyurea, the patient questioned if the physicians had changed her dose of the chemotherapy agent because she already had taken the same medication that morning. Of note, the nurse was not certified as a chemotherapy and biotherapy provider.

The nurse immediately notified the physicians on the floor, including the hematology/oncology attending physician, and called the pharmacy to report the medication error. The attending physician and pharmacist agreed that no intervention was needed because of the low dose of the agent and the amount of time between administrations. Fortunately, the patient did not experience any negative consequences because of this error.

Analysis

The American Society of Clinical Oncology (ASCO) and Oncology Nursing Society (ONS) have jointly published safety standards that should be strictly adhered to when administering all forms of chemotherapy agents, including oral agents (Neuss et al., 2013). These standards recommend that all nurses who administer chemotherapy be certified. Before the chemotherapy agent is administered, two certified providers should review the drug name, dose, volume, ordered rate (in the case of IV agents), and expiration date, as well as the patient’s name and birthdate. In addition, a second safety check should be completed at the patient’s bedside or chairside (Neuss et al., 2013). Because oral chemotherapy can have the same toxic effects as IV chemotherapy, the same handling and

M. E., a 72-year-old female patient with a history of chronic myelogenous leukemia, arrived on the oncology inpatient floor from the hospital’s emergency department for sepsis from a respiratory infection. Her medications had been reviewed independently by the emergency department nurse and physician. The patient was seen regularly in the outpatient clinic, so her medication records transferred directly to the inpatient setting. During the initial nursing assessment on the inpatient oncology unit, which was confirmed during the physician’s assessment, M.E. reiterated that she was still taking the same medications and dosages listed on her record.

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administration safety policies must be followed (Lester, 2012).

At the institution where this case study occurred, no computerized or automated safeguards required assessment or documentation of when the last dose was taken prior to admission. Because the electronic health records were transferred from the outpatient setting and the medication record was verified, the pharmacy verified and dispensed the medication, the automated medication dispensing machine allowed the medication to be removed, and the barcode technology allowed the medication to be administered. When the last dose was taken at home was not documented, and the technology did not require this assessment to be made or documented.

Electronic safeguards were rendered useless in preventing this error.

Although the nurse upheld many of the 10 principles of medication administration—correct drug, correct patient, correct route, correct evaluation, correct dose, correct time, correct documentation, correct assessment, correct education, and right to refuse (Lester, 2012; Potter, Perry, Stockert, & Hall, 2013)—several rules of medication administration were not adhered to, which contributed to this medication error. The most important consideration that failed to be addressed was proper assessment. To prevent this error, the emergency department’s and the unit’s physicians and nurses needed to conduct a thorough medication history, which would have revealed when the patient had last taken the hydroxyurea and identified the need for a modification to be made to the existing order (Potter et al., 2013). In addition, the ASCO and ONS guidelines emphasize that the nurse, with the medication in hand, should have the patient state the chemotherapy regimen before administering the agent (Neuss et al., 2013). In this case, the patient should have stated the name of the medication, the dose prescribed, when it was usually taken, and what time she had taken her last dose. That additional assessment would have prevented the error.

Another significant factor that may have contributed to this medication error was allowing an uncertified nurse to administer a chemotherapy agent. ONS strongly recommends that all nurses who administer chemotherapy undergo additional training and education regarding the safe handling and administration procedures associated with chemotherapy. Chemotherapy-certified nurses are better equipped to keep patients and themselves safe during the preparation and administration of chemotherapy because they know how to implement the ASCO and ONS safety standards (ONS, 2015). The uncertified nurse may have been unaware of these policies and procedures. In this case, the uncertified nurse was unaware of the ASCO and ONS safety standards and, therefore, proceeded to administer the chemotherapy agent without the proper verification policies and procedures.

**Implications for Nurses**

Medication errors are an unfortunate reality in health care. The systems designed to prevent medication errors can break down at many points. Chemotherapy can be a complex drug regimen with potentially serious consequences if it is not ordered, prepared, or administered correctly. Additional checks and procedures often are required when administering chemotherapy. For this reason, nurses should not administer chemotherapy unless they have had extensive training and certification. Unsafe practices may lead to chemotherapy errors and overdoses (Vioral & Kennihan, 2012).

Patients often assume that oral anti-neoplastics are not “real” chemotherapy or not associated with as much toxicity (Moody & Jackowski, 2010). This myth is pervasive. In this case study, as in routine nursing practice, many opportunities exist to correct this myth. Ideally, the nurse should have asked the patient for the name and dose of the chemotherapy agent and when she had last taken the agent. At this point, the nurse had the opportunity to educate the patient on the importance of maintaining a schedule, any potential side effects, and what signs or symptoms should be reported.

When a chemotherapy or medication error occurs, as in this case, the entire oncology team must step back and evaluate what happened. This is not meant to be punitive, but rather to determine where a break in the system occurred and to try to prevent similar errors. In this case, adding an assessment question about when the medication was last taken prior to admission and adding staff education about complete assessment may help prevent future problems.

Fortunately, systems have been designed to decrease the occurrences of medication errors, including automated drug-dispensing machines, unit-dose packaging, readily accessible drug references, and computerized cross checks for incompatibilities (Anderson & Townsend, 2010). In addition, electronic physician order entry systems, barcode technology used in conjunction with an electronic health record, and smart infusion pumps are designed to decrease medication errors (Tzeng, Yin, & Schneider, 2013). However, these systems are not infallible, and medication errors still may occur even if these systems are used correctly. Nurses need to remember that they are a critical link in the safe administration of medication and that their assessment and attention to detail cannot be replaced with electronic technology.

When patients transfer between the inpatient and outpatient settings, the time when each medication was last taken must be assessed, particularly when administering potentially toxic or time-sensitive medications, such as chemotherapy agents. This assessment can help prevent potential errors, such as the one described in this case.

**Conclusion**

Medication administration is an important and time-consuming nursing task. Electronic medication administration systems focus on the task of medication administration, not necessarily the science and art of the best practices for medication administration. Medication administration, including assessment and patient education, is often more complicated in oncology nursing because of the complexities of the agents and dosing regimens. However, chemotherapy administration is much more than a task. When not completed correctly, chemotherapy administration may result in potentially deadly complications. With chemotherapeutic agents, nurses also should consider that oral agents demand as much attention as agents delivered via other routes, such as IV infusion. In addition, patient education is critical to promote safe and accurate delivery.
Chemotherapy-certified nurses have specialized knowledge and a better appreciation of the implications and potential risks associated with chemotherapy administration. Certification is not simply an ideal standard, but should be a necessary standard for safe chemotherapy administration. Oncology nurses need to use the safeguards associated with electronic medication administration systems and also realize that these systems are not foolproof. Errors still can occur. Comprehensive nursing assessments, thorough use of the 10 principles of medication administration, and correct use of electronic safeguards all are indispensable.

References


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