



## Response to “Improving Patient Safety With Error Identification in Chemotherapy Orders by Verification Nurses”

We read, with great interest, the study by Baldwin and Rodriguez (2016), which described the role of the verification nurse and details the verification process in identifying errors related to chemotherapy orders. We strongly agree with their findings that a verification nurse, collaborating closely with the prescribing physician, pharmacist, and treating nurse, can better identify errors and maintain safety during chemotherapy administration. We are from a Joint Commission International (JCI)-accredited academic medical center hospital in China with 3,200 beds.

According to JCI (2014), good medication management includes two reviews of each prescription or order:

- The appropriateness review of the medication for the patient and his or her clinical needs must be performed by a licensed pharmacist, technician, or trained professional at the time the medication is prescribed or ordered, focusing on (a) the appropriateness, dose, frequency, and route of administration; (b) therapeutic duplication; (c) real or potential allergies or sensitivities; (d) real or potential interactions between the medication and other medications or food; (e) variation from hospital criteria for use; (f) patient's weight and other physiologic information; and (g) other contraindications.
- The verification review of the medication that is exactly as ordered or prescribed should be performed at the time of administration, focusing on the identity of the patient, medication, time and frequency of administration, dosage amount, and route of administration with the prescription or order.

If the drug will be dispensed from stock on the nursing unit, the appropriateness review may be conducted with the verification review when the ordering person administers the medication and monitors the patient. When the ordering person is not available, other

trained individuals should perform the appropriateness review for administration of the first dose of the medication, focusing on at least four critical elements (i.e., allergies, lethal drug-drug interactions, weight-based dosaging, and potential organ toxicity). The entire appropriateness review must be performed by the pharmacist prior to administration of subsequent doses. The current JCI accreditation standard does not have additional requirements on the appropriateness review of chemotherapy orders, despite emphasizing that a hospital should place limits on prescribing or ordering by an individual for chemotherapy agents and that independent double checking (IDC) is recommended prior to medication administration of very selective high-alert medications.

We have achieved significant quality improvements in decreasing medication administration errors during the journey to JCI accreditation and post-JCI accreditation era (Wang et al., 2015). We have also integrated clinical guidelines, implemented IDC policy for administering high-risk drugs, established an online medication error reporting system, given lectures on rational medication use, and monitored the key measures of quality improvement and patient safety. However, three root cause analyses were performed to examine medication errors associated with inappropriate chemotherapy orders in the past three years. In the first case, a nephrology medical physician intended to prescribe cyclophosphamide infusion for a patient with lupus nephropathy but mistakenly prescribed it for another patient with uremia. The ward nurse did not detect this error and sent orders to the pharmacy IV admixing service center (PIVAS). Unfortunately, the auditing pharmacist did not identify this error. The infusion was prepared and distributed. The treating nurse did not intercept the error, and the patient received the wrong medication.

The second case was also from a nephrology medical ward. A resident physician intended to prescribe a cyclophosphamide infusion for a patient with nephritic syndrome, but she mistakenly prescribed meglumine adenos-

ine cyclophosphate; the two drugs sound alike in Chinese. The nurse did not identify this error and sent orders to PIVAS. The auditing pharmacist felt that the dose was strange, contacted the physician, and successfully intercepted the error. The third case involved a laparoscopic surgeon who intended to prescribe oral tegafur-gimeracil-oteracil potassium capsules with IV oxaliplatin for a patient with gastric cancer, but she mistakenly prescribed these chemotherapeutic agents for another patient with gastric cancer in another general surgery ward who should not have received chemotherapeutic agents because of low blood counts. The mistake was not detected by the nurse, and these orders were sent to the inpatient pharmacy. The auditing pharmacist did not have enough time to carefully review the patient's blood counts and did not question the order. The treating nurse completed oral administration without implementation of IDC and did not prevent the error, whereas two other nurses implemented IDC policy and successfully intercepted the potentially fatal error prior to IV administration. The two actual adverse events resulted in additional laboratory examinations and prolonged hospitalization.

From January to October 2016, 12 cases of chemotherapy-related near misses were intercepted by auditing pharmacists. Four cases of adverse events were associated with chemotherapy: a patient identity error, an administration time error, a route error, and a case of medication discordant with clinical need ( $n = 1$ ).

From the previously mentioned medication errors, we deeply feel the necessity of strengthening the role of the verification nurse prior to sending chemotherapy orders to the pharmacy, as well as establishing a specialized cancer center for administering chemotherapy. In most large-scale general hospitals in China, patients with cancer are usually in different clinical departments. Besides the oncology medical department, other departments may administer chemotherapeutic agents as well. In our hospital, we have only one full-time