FRONTLINE NURSES spend much of their time administering medications. Accurate and safe medication administration depends on nurses’ pharmacologic knowledge, decision making, and critical thinking skills.

In a fast-paced healthcare environment, administering medications is a high-risk nursing task. Medication errors may occur during any phase of the medication process: prescribing, transcribing, dispensing, administering, monitoring, and reporting. This article focuses on nurses’ roles in medication administration. Start by considering the effects of medication errors.

Consequences of errors
Medication errors can have serious and costly consequences, such as increased patient lengths of stay, additional medical interventions, serious harm, or even death. According to a new study conducted at Johns Hopkins University, medical errors have become the third leading cause of death in the United States, claiming 250,000 lives annually.1

For nurses, making a medication error is an emotionally traumatic experience that undermines their self-esteem and confidence to function in the workplace.2 Jones and Treiber used quantitative and qualitative questionnaires to survey 202 nurses; 158 claimed they’d made medication errors.2 Qualitative data analysis showed several themes. For instance, making an error makes nurses feel depressed, guilty, embarrassed, regretful, and fearful about providing safe care and violating the patient’s trust. Nurses involved in medication errors experience moral distress and want to leave nursing practice.2

Why aren’t errors reported?
Reporting medication errors is problematic due to fears of reprisal, intimidation, or disciplinary actions.3 Oshikoya et al. surveyed pediatric nurses working in a public hospital to examine their experience with medication administration errors.3 Structured questionnaires were distributed to 75 nurses, and 50 nurses completed them. The major factors contributing to errors were found to be increased workload (26.2%) and failure to check the drug dosing (12.24%). Barriers to reporting medication errors included fear of punishment for committing the error (11.22%), lack of a standard reporting system (13.26%), and fear of punishment for reporting the errors (27%). As a result, 34% of medication errors weren’t reported by nurses.

Nurses may fear that reporting errors can increase the chance of litigation. A qualitative study by Hartnell et al. identified barriers to medication error reporting.4 Results were categorized into themes: inconvenience of reporting, professional identification, missing information, ineffective organizational system, and fear of punishment. These barriers can be overcome by making the reporting process easier, using proper communication, and providing education on reporting. Encouraging staff to report an error may eventually reduce the incidence of medication errors and enhance patient safety.

Contributing factors
Nurses who don’t follow the five rights (right drug, right patient, right dose, right time, right route) of medication administration can contribute to medication errors. Deficits in pharmacologic knowledge, miscalculations, distractions, increased workloads, and fatigue are common reasons why the five rights aren’t always followed.

Because drug calculations can be complex, proficiency in mathematical skills is required for safe drug administration.5,6 Fluid bolus and tablet formulations are generally easy to calculate, but continuous I.V. infusions of high-risk medications such as heparin, insulin, and vasopressors involve complex calculations.

Understanding decimals is important when performing dosage calculations. Misplacing or omitting decimals can result in serious calculation errors.7

During drug preparation, nurses can be distracted when they’re interrupted. Research has revealed that distractions contribute to medication errors.8-10 In a study by Esqué Ruiz et al., nurses reported 65.4% of medication errors and 59% of them were due to distractions.9

Increased patient workloads may predispose nurses to take shortcuts and fail to follow drug administration procedures, such as verifying patient identification. In Kim and Bates’ observational study of 293 nurses, only 6.5% checked their patients’ wristbands and

Simple steps to reduce medication errors
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3.5% asked to confirm patients’ names.11
Lack of adequate staffing increases workload and fatigue, which negatively affect the nurses’ work performance related to drug administration. When nurses are both distracted and physically exhausted, the risk of drug dose miscalculation increases.10

Preventing missteps
Proficiency in drug calculations is essential for safe medication administration. Having sound basic mathematical skills and performing accurate drug calculations can significantly minimize medication errors. Nurse educators play an important role by having an education plan in place to ensure nurses maintain their proficiency in medication calculation. Simulated practice in medication administration can benefit nurses without the risk of harm to patients.

Nurses must improve their pharmacologic knowledge and keep up-to-date about new drugs.3 Ongoing medication competency must be maintained. Pharmacologic continuing education updates nurses about the safe use of new drugs, including appropriate indications and dosages, proper administration, drug actions, contraindications to use, drug-drug interactions, potential adverse drug reactions, patient monitoring, patient teaching, and documentation.

Interventions to decrease distractions can enhance patient safety. Some healthcare facilities have implemented the sterile cockpit rule, which means eliminating distractions during medication preparation to avoid medication errors. This strategy was developed by the airline industry in the 1980s to preserve safety in the cockpit area by preventing nonessential activities or conversations during the critical phase of flight. In a study by Fore et al., the rate of medication errors dropped by 42.78% when this rule was in place.12

Because nurses tend to be in constant communication with their patients and the healthcare team, the sterile cockpit rule may be challenging to implement. A “do not disturb” or “quiet zone” sign in the medication preparation area can help minimize distractions.

To safeguard against medication errors, nurses must implement the proper procedures for medication administration, including at least these five rights: right patient, drug, dose, route, and time. In addition, they must complete accurate documentation once the patient receives the medication.11,13 Failure to record the medication administered increases the risk that the patient will receive another dose. Nurses should be cautioned not to document the dose before the medication is given because, for one reason or another, the patient may not receive the medication at all or might receive it at a different time than documented.

Patients need to be well informed of medications’ therapeutic effects, potential adverse reactions, and desired outcomes. Evaluating the effect of certain medications is crucial to ensure the patient has responded to the medication; for example, high blood glucose levels may be treated with sliding scale insulin dosages. The patient’s blood glucose levels must be closely monitored to ensure they’re within the desired therapeutic range, and the patient must be closely monitored for and taught to report adverse reactions, such as signs and symptoms of hypoglycemia.

When administering an analgesic, the nurse must first assess the patient’s pain level, administer the analgesic drug, and then monitor for adverse reactions and evaluate and document the therapeutic response. If the desired effect isn’t achieved, the patient may have received an inadequate dose or may require a different analgesic for pain control.

Many medications can be administered via different routes, such as oral or I.V., increasing the possibility of confusion. Some forms of medications, such as enteric-coated medications intended to prevent stomach irritation, shouldn’t be crushed. Nurses should frequently double-check to ensure they’re administering medications via the correct route and in the prescribed form.

Providers may prescribe specific I.V. dosing regimens based on their own preference and previous experience, institutional standards, and smart pump setup. For example, dopamine infusion titrations may be prescribed using microgram/kilogram/minute dosages or microgram/minute dosages to maintain the mean arterial pressure above 65 mm Hg.

Using multiple dosing methods for the same drug can be confusing, increasing the risk of errors.14 Standardizing the dosing method for I.V. medications such as epinephrine, midazolam, and nitroglycerine infusions in the ICU could minimize dosing errors.15 Referring to a list of high-alert drugs can help safeguard nurses from making medication errors.16

Understanding the placement of decimals is crucial; for example, 0.20 mg is 10 times greater than
0.02 mg. Nurses need to have a clear idea of decimal placement and values to avoid calculation errors. 

Technology such as smart pumps and bar code-assisted medication administration (BCMA) can help to decrease drug-dosing errors when used appropriately. Nurses using BCMA scan the patient wristband and medication codes before administering medications. In one study, BCMA decreased wrong dosage errors by 90.4%, medication administration errors by 80.7%, and medications lacking prescriptions by 72.4%.  

I.V. smart pumps have error prevention software, drug libraries, and dosing limits that give an alert when the dosing is out of range.  

Manrique-Rodríguez et al. studied the benefits of using I.V. smart pumps in pediatric ICU patients. A total of 624,252 infusions were initiated, and 486,875 medications were programmed through the smart pump drug library. User safety software compliance was 78%. Using the smart pump device resulted in 92 cases of programming errors being intercepted; 84% of these medications were for pain, sedation, cardiac conditions, and infections. Using smart pumps enhanced patient safety. Reporting medication errors helps identify failures in medication processes and may help to prevent further incidents. When medication errors are reported, risk managers use the information to better understand the root causes and develop policies and procedures to prevent future patient harm. When errors are reported voluntarily in a guilt-free, blame-free system, a proper investigation can be performed and practice can be improved. 

Many hospitals use electronic reporting systems, which let the individual involved in a medication error provide information electronically. Managers and quality risk management are then notified electronically. The key benefits of the system include increased reporting of medication errors, identifying close-call events (errors that are identified and corrected before reaching the patient), and improved tracking, which is followed by action.  

When data from medication errors are shared, an action plan can be developed, which may reduce further errors. 

Stepping up 

Medication errors are preventable events. Safe medication practices, adequate resources, a work environment free from interruptions, and a nonpunitive approach to error reporting should be encouraged. 

REFERENCES 

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