



Handle with Care: Nurses as *Pharmacists* vs Nurses as Nurses

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Traditionally, chemotherapy was prepared and administered in the hospital inpatient setting. Today, because cancer care is provided primarily in the outpatient setting, chemotherapy is most often delivered in the ambulatory hospital setting and/or the physician office. Further complicating this change of setting is the fact that, for the past few years, hospitals have been inadequately reimbursed for chemotherapy delivery. Many items required for chemotherapy—such as protective equipment, IV solutions, tubings, and the cost of the salaries of the nurses and pharmacists who administer the anti-cancer drugs—are not reimbursable. While reimbursement for physician

offices has not been as bleak, chemotherapy delivery in both settings continues to be affected by yearly changes in reimbursement rules and regulations.

Who Delivers the Chemotherapy?

Currently, when chemotherapy is given in the hospital outpatient setting, nurses administer the chemotherapy drugs, while pharmacists continue to prepare the drugs in the hospital pharmacy. Clinical nurse specialists and pharmacists are available to discuss potential reactions, side effects, and patient care, and to educate and train new staff on treatment protocols.

Physician practices that administer chemotherapy usually follow one of two treatment models.

Large group practices may employ pharmacists or pharmacy technicians in their clinics. In the physician office setting, pharmacists prepare and mix anti-cancer drugs, train staff on safe handling and administration of cytotoxic medications, and provide patient education. Pharmacy technicians must work under the supervision of a pharmacist. Credentials of pharmacy technicians differ from state to state. Employing a pharmacy technician may create cost savings for practices, both in salary range (as compared with oncology nurses) and in terms of efficiency. For example, employing a pharmacy technician can allow nurses to spend more time caring for and/or educating patients. Using pharmacy technicians may even increase a practice's patient volume. Before hiring a pharmacy technician, however, be sure to check state guidelines related to the use of technicians and chemotherapy preparation.

In smaller practices, nurses usually prepare, mix, and administer the chemotherapy drugs to the patients.

A 2003 study surveyed oncology nurses on chemotherapy-handling practices in office, clinic, or private practice settings and found that 49 percent of respondents used pharmacists for chemotherapy preparation and 49 percent used nurses.¹

Nine percent of respondents reported that ancillary technicians handled chemotherapy preparation, either alone or in association with licensed practitioners for chemotherapy preparation.¹

Whether chemotherapy is being provided in the hospital or practice setting, safe and proper handling of cytotoxic medications is essential. Cancer programs need to establish, monitor, and update policies and procedures regarding staff competencies and safety issues involved in working with anti-cancer drugs. Three helpful resources are Chemotherapy and Biotherapy Guidelines and Recommendations for Practice and Safe Handling of Hazardous Drugs—both by the Oncology Nursing Society (ONS)—and Guidelines on Preventing Medication Errors with Antineoplastic Agents by the American Society of Health-System Pharmacists (ASHP).

Education and Evaluation

An experienced oncology nurse is critical to the success of any chemotherapy program—whether it is in the hospital outpatient or physician practice setting. To understand the appropriate protocol that would be ordered to treat a patient with cancer, nurses must first understand cancer. In administering chemotherapy, understanding where the patient is in the treatment regimen is as important as knowing the drugs themselves. Oncology nurses bring these skills to their work.

Cancer programs should identify the qualifications needed for staff that will administer chemotherapy. Review the appropriate state Nursing Practice Act to determine the chemotherapy duties nurses are allowed to perform related to the scope of practice. Outline the core knowledge necessary for staff involved in administering chemotherapy and then assign a qualified professional to train staff on chemotherapy preparation and delivery.

Nurses should attend a national chemotherapy provider course, such as the ONS-sponsored Chemotherapy and Biotherapy Course. The ONS course is for registered nurses with at least six months work experience. The two-day course (16.2 contact hours) concentrates on the theoretical knowledge base needed to administer chemotherapy and biotherapy, including cellular kinetics, drug classifications, safe handling, administration, management of side effects, and patient teaching strategies.²

Participants take a written test and must receive a score of 80 percent to receive an ONS Chemotherapy Provider Card. After two years, the card may be renewed by independent study that includes information on new drugs, administration techniques, and other practice issues.²

The ONS Chemotherapy and Biotherapy Course does not cover the skill of mixing medications. After completing the ONS course, nurses must complete a practicum, designed by the institution in which they work, to meet technical administrative competency.

Physician office-based practices may consider contracting with a hospital pharmacist to train nursing staff in drug preparation. If an oncology-trained pharmacist is not available, The Pharmacy Sterile Products Training Manual (Pharmacy Education Resources, Inc., Houston, Tex.) reviews the training necessary for proper drug preparation, including chapter review questions that can be used as competency checklists.

Regardless of the practice setting, each year, nurses who administer chemotherapy should demonstrate their competency to another certified chemotherapy nurse. Cancer programs should design standard chemotherapy preparation and administration checklists to test nurse competence and verify skills necessary to administer chemotherapy in a safe and competent manner.

ASHP recommends that health organizations require all personnel who prescribe, prepare, dispense, administer, and handle hazardous drugs to complete job-appropriate training and evaluation in the following competencies:

- Vial preparation
- Care of the laminar airflow hood
- Labels for IV mixture
- Dose calculations
- Drug compounding concentrations, including determination of expirations
- Portable infusion pump fills
- Infusion rates.

Cancer programs should establish procedures to continually monitor staff performance. Develop a system for verifying and documenting acceptable staff performance. To determine staff knowledge of drug calculations and formulas as related to drug preparation, test staff on chemotherapy ratios, proportions, percentages, and calculations. Require a passing grade from new hires. If remedial corrections are necessary, offer staff additional training and document the remedial action taken.

Handle With Care: A Double Check System

While the rate of medical errors related to antineoplastic agents is not known, the incorrect use of these drugs threatens patient welfare.³ An extreme example occurred in 1994 at a renowned cancer center when a patient died after receiving 26 grams of a chemotherapy drug instead of the correct dosage of 6.5 grams. In a 1999 ONS survey of ONS members and nonmembers employed in various oncology settings, 63 percent of respondents reported that chemotherapy medication errors had occurred in the workplace.⁴ Of the 140 errors described, mistakes were attributed to under dosing, over dosing, scheduling and timing, wrong drugs, improper preparation, stress, understaffing, unclear orders, and lack of experience.⁴ Only 3 percent of these errors were reported to a national database.

Cancer program administrators should prepare written guidelines for safety practices for preparing, mixing, and administering anti-cancer drugs and ensure that staff complies with these practices. Identify a staff member who will be responsible for ensuring safe drug preparation. New more complex treatment plans including variable doses and high-

dose therapies, call for additional safeguards.

Develop a method to monitor the safety of patients and staff. Healthcare workers exposed to hazardous drugs during the course of their work may absorb these drugs and may be at risk for adverse outcomes.⁵ Proper handling helps ensure patient safety and decreases occupational exposures for healthcare staff.

Standardization of care can also help decrease employee exposure and eliminate drug errors. Develop a checklist for IV preparation, dosage calculations, and labeling to standardize the steps necessary for completion. Using a standardized chemotherapy order format, in which total dose, dose per meter squared, and drug names are clearly written, helps to decrease the potential for error.

A double-check system during preparation of the drug and at administration time is standard practice in oncology. The double check system should be staffed by two chemotherapy competent individuals (e.g., two RNs or a pharmacist and an RN) who double check that all medication being administered is for the correct patient, is the correct drug, is ordered at the correct dose for that patient, is calculated correctly, and uses the correct route. Consider “dose banding,” in which prefilled syringes containing a predetermined range of a dose are used.⁶ Because the same dose is used for a range of body surface areas, dose banding eliminates the calculation of each individual patient dose. If the body surface area falls in a particular range, an assigned drug amount is administered.

Take a critical look at the cancer program’s patient/staffing ratios. Allowing nurses adequate time to review and double check medication should limit medication errors. Ambulatory cancer programs should develop a documented acuity and productivity system. These procedures can help identify the appropriate number of staff that is necessary to assess, evaluate, and perform the treatment orders, including mixing chemotherapy.

Become familiar with state and federal guidelines related to chemotherapy or hazardous drugs. The Occupational Safety and Health Administration (OSHA) has developed workplace safety guidelines, which describe equipment, worker education recommendations, and medical surveillance of employees.⁷ OSHA recommends training all staff involved with any aspect of the handling of hazardous drugs. Among other items, the guidelines call for the use of personal protective equipment, the use of a biologic safety cabinet during the preparation process, criteria to classify drugs as hazardous, and evidence related to these drugs as an occupational hazard.⁷

Establishing a comprehensive program for the safe administration of chemotherapy requires several other key components. First, review the OSHA guidelines and determine how they apply to a specific practice. Then, develop an OSHA practice checklist so that the facility can survey its compliance and provide documented recommendations for the practice. Meet with the environmental services department or cleaning service to determine appropriate waste disposal.

Document all training provided to the cleaning service and ensure that all hazardous waste manifest logs are filed.

Develop policies and procedures related to administration, handling of waste, drug preparation, and the use of equipment. Finally, review safety equipment and administration equipment to determine safe practices. Be sure that practice equipment is checked and serviced regularly to avoid potential errors such as a drug being delivered as a bolus instead of continuously.

An Ongoing Review Process

Practice administrators and managers must continue to review and fine-tune standardized processes and procedures to decrease medication errors, enhance safety, and monitor patient outcomes.

In addition to the skills’ checklists and annual competencies review previously discussed, your cancer program should also develop quality improvement plans related to preparation, administration, and ordering of medications; drug calculations; spills; and handling waste. Identify qualified individuals to act as “monitors,” spot-checking the chemotherapy process and participating in annual competency reviews of the staff. The entire cancer team should review these quality monitors, as well as all medication error reports. Identifying issues or problems will help determine follow-up education for staff.

Nurses who are asked to act as pharmacists and prepare, mix, and administer chemotherapy drugs must be provided with the proper training. With the new anti-cancer drugs and treatment regimens coming down the pipeline, cancer programs need to regularly revisit their staff procedures and policies. Training, monitoring, evaluation, and re-training are important components to ensuring that staff responsible for handling and administering chemotherapy drugs provides state-of-the-art care.

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