

Health hazard to community practice nurses: the ‘big worry’

Side effects of handling toxic chemotherapeutic agents range from skin rashes to birth defects to cancer. If you work in a private practice, experts are especially worried about you.

By Cori Vanchieri

Nurses need a healthy dose of respect for the toxicity of chemotherapy drugs. “Some still see them as akin to antibiotics,” says Melissa A. McDiarmid, MD, MPH, professor of medicine and director of occupational health programs at the University of Maryland Medical School. “But the potential hazards are very real, especially for reproductive risks, which take only a one-time exposure, and apply to both men and women.”

For years, oncology nurses, doctors, and pharmacists have relied on the use of hoods, safe-handling practices, and protective equipment to avoid harming themselves when working with toxic chemotherapy drugs. It turns out those precautions aren’t good enough.

So last year, the National Institute for Occupational Safety and Health (NIOSH) released a new alert, co-authored by Dr. McDiarmid, laying out more stringent recommendations for the protection of nurses, pharmacists, and other technical staff who prepare and administer the drugs and clean up after treatment.

Now the challenge is convincing nurses and their employers to take action.

The “big worry,” says Dr. McDiarmid, “is the private, community practices. They don’t have the staffing flexibility or oversight. If a healthcare worker is pregnant, she shouldn’t be handling these drugs. In a hospital, you can have that nurse deal with patient education and phone triage. In

a busy, private practice, moving staff around becomes more challenging. It’s hard to have the policy and infrastructure these agents deserve in a private practice.”

Old guidelines

Until recently, experts were fairly confident that the workplace was safe because workers were following 1986 guidelines that had been issued by the Occupational Safety and Health Administration (OSHA). “The assumption was always that if we used the protective equipment and the biological safety cabinets, they provided enough protection,” says oncology nursing consultant Susan Martin, DNSc. But new studies showed otherwise.

The wake-up call was a report by Thomas H. Connor, PhD, now at NIOSH, part of the Centers for Disease Control and Prevention (CDC). He found widespread contamination in six cancer treatment centers in the US and Canada. Measurable amounts of three anticancer agents were detected in 75% of samples in pharmacy drug-preparation areas and in 65% of samples in chemotherapy administration areas. Although he did not wish to name the centers, Dr. Connor says one of the US facilities was a large, NCI-supported cancer center; the other two were smaller facilities. “They all followed OSHA guidelines quite well, although probably not 100% of the time,” he says.

Other studies conducted at the same time as Dr. Connor’s work have found that pharmacists and nurses

who handled cyclophosphamide were exposed to enough of the drug so that it appeared in their urine.

Risky business

The risks of handling chemotherapy drugs include skin rashes, infertility, miscarriage, birth defects, and possibly leukemia or other cancers. Bladder cancer, lymphoma, and leukemia are the three most common secondary malignancies related to chemotherapy exposure, points out Marty Polovich, RN, a contributor to the NIOSH Alert.

Personal protective equipment checklist

The NIOSH Alert provides 16 employee precautions and 17 employer precautions to reduce exposure to hazardous drugs. The critical personal protective equipment includes:

- Two pairs of powder-free, disposable chemotherapy gloves. The outer pair should cover the gown cuff.
- Disposable gown that does not create lint and is nonabsorbent. Gown should have closed front, long sleeves, and elastic or knit closed cuffs. Do not reuse gowns.
- Face shield when there is risk of splashes to the eyes, nose, or mouth.
- A NIOSH-certified respirator, when there is risk of inhaling aerosolized drug, such as during spill cleanup. A surgical mask is not adequate.

Which anticancer drugs cause cancer?

The International Agency for Research on Cancer (IARC) in Lyon, France, has evaluated 900 agents for their potential to cause cancer in humans. Below is the list of drugs and regimens used to treat cancer patients that have made it onto IARC's list of carcinogens plus possible and probable carcinogens.

Group 1: Carcinogenic to humans

Azathioprine	MOPP
Busulfan	Semustine
Chlorambucil	Tamoxifen
Cyclophosphamide	Thiotepa
Melphalan	Treosulfan

Group 2A: Probable carcinogens

Carmustine	Doxorubicin
CCNU	Nitrogen mustard
Cisplatin	Procarbazine

Group 2B: Possible carcinogens

Bleomycin	Mitomycin
Dacarbazine	Streptozocin
Daunorubicin	

For details, visit the IARC Web site:
www.cie.iarc.fr/monoeval/grlist.html

Exposures can occur through inhalation of aerosolized drug, absorption through the skin, ingestion, or injection. Drugs can collect on work surfaces and be absorbed through the skin. The NIOSH Alert contains a long list of exposure opportunities, including handling hazardous drug-contaminated waste; counting out individual, uncoated oral doses from multidose bottles; and expelling air

from syringes filled with hazardous drugs. Biological safety cabinets, which move air away from workers during drug preparation, provide less-than-perfect protection.

Intravenous (IV) equipment has been designed with patient safety in mind, not healthcare worker protection, says Ms. Polovich, a clinical nurse specialist at Southern Regional Health System, in Riverdale, Georgia. When administering drugs, spiking IV containers with IV tubing and unspiking to remove tubing, result in leakage, as can needle-less connectors on IV equipment. One study used a fluorescent scanning device to detect doxorubicin contamination on workers' gloves, clothing, and hands after glove removal. The workers were unaware they were contaminated.

"I do a lot of lecturing on safe handling, and there are still many people who don't take the risk seriously," says Ms. Polovich. "They ask me, 'Aren't you exaggerating a bit?' My answer is 'no.' Although most people who work with hazardous chemicals prepare for the worst-case scenario, nurses don't think that way. Last fall, I had one nurse whose spike fell out of a bag, and she got a bath with the drug. Was she wearing a gown? No. She didn't expect it to happen."

The nurse did change her clothing immediately and showered. "She was lucky not to experience any problems, because the drug is a known skin irritant," Ms. Polovich says. Now the

nurse wears a gown, and, rather than spiking the bag while it hangs on the IV pole, she holds the bag in her hand when introducing the tubing.

Scary numbers

At the April 2005 annual meeting of the Oncology Nursing Society (ONS), nursing consultant Susan Martin presented the results of her survey of 7,500 ONS members. Fully half the nurses who received the survey responded. Nurses who handled chemotherapy prior to and during pregnancy were 2.3 to 5 times more likely to give birth prematurely and have children with learning disabilities, especially speech and motor problems.

"The only personal protection equipment that was predictive as a risk reducer was glove use," Ms. Martin says. "My big message is: 'Wear gloves almost all the time and change them frequently.'"

In an earlier study conducted before the new NIOSH Alert was published, Ms. Martin determined patterns of use of personal protective equipment among a random sample of oncology nurses who work in office, clinic, or outpatient private practice. Biological safety cabinets were used by virtually all, and more than 94% reported usually wearing gloves during chemotherapy handling. However, just about half reported using protective gowns, and fewer than 6% said they usually use face and respiratory protection. Only 46% of sites reportedly provide any type of

Get the facts

NEW GUIDELINES

The NIOSH Alert, *Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings*, can be downloaded from the NIOSH Web site at www.cdc.gov/niosh/docs/2004-165/. Single copies of the NIOSH Alert (Publication No. 2004-165) can also be ordered by mail or telephone: NIOSH—Publications Dissemination, 4676 Columbia Parkway, Cincinnati, OH 45226-1998; phone: 1-800-35-NIOSH (1-800-356-4674).

TRAINING

The Oncology Nursing Society (ONS) runs an online training course three times a year called *Safe Handling of Hazardous Drugs*. The next session is August 8–28, 2005. Register online at <http://onsopcontent.ons.org//Meetings/safehandling/home.html>. ONS also offers the publication *Chemotherapy and Biotherapy Guidelines and Recommendations for Practice*, which covers basic safe-handling issues and procedures.

medical monitoring.

“Even though people say they are doing it right, everybody admits there are discrepancies between policy and practice,” says Dr. McDiarmid, who will soon begin a study at three hospitals in Maryland, North Carolina, and Texas. That study will evaluate drug contamination in the workplace and assess workers’ exposure.

The study was first proposed in 2002 but is on hold. Twice the Office of Management and Budget (OMB) sent it back to the CDC with technical questions. NIOSH spokesman Fred Blosser said that the CDC plans to resubmit the proposal to OMB, but he doesn’t know when that will happen. “The study would help us get a better set of data

and a better understanding of how prevalent contamination might be, but employers shouldn’t wait for additional studies to follow the recommendations,” he says.

Changing behavior, even boosting awareness, will take work. “I did a major program for 60 nurses the other day,” Ms. Martin said. “Only six knew of the NIOSH Alert.”