

## Medical Surveillance for Health Care Workers Exposed to Hazardous Drugs

### Summary

Health care workers who handle, prepare, or administer hazardous drugs may face risks to their own health such as skin rashes, cancer, and reproductive disorders. NIOSH recommends that employers establish a medical surveillance program to protect workers who handle hazardous drugs in the workplace.

### Description of Exposure

Drugs are considered hazardous if studies in animals or humans show that exposures to them have a potential for causing cancer, reproductive toxicity, birth defects, or acute harm to health. In the United States, an estimated 5.5 million health care workers are potentially exposed to hazardous drugs or drug waste at their worksites. These workers include pharmacists and pharmacy technicians, nursing personnel, physicians, operating room personnel, shipping and receiving personnel, waste handlers, maintenance workers, and workers in veterinary

practices. Workers may be exposed to hazardous drugs when they create aerosols, generate dust, clean up spills, or touch contaminated surfaces when preparing, administering, or disposing of hazardous drugs [NIOSH 2004].

Many hazardous drugs are used to treat illnesses such as cancer or HIV infection (see Figure 1). For the patients, the potential benefits of hazardous drugs outweigh the possible negative side effects. However, exposed health care workers risk the same side effects with no positive benefit. Workers exposed to hazardous drugs have developed skin rashes, adverse reproductive effects, and possibly leukemia and other cancers. For example, nurses and pharmacists who were exposed to hazardous drugs at their worksite reported an increase in adverse reproductive events including spontaneous abortions, stillbirths, and congenital malformations compared with unexposed health care workers [NIOSH 2004].



**Figure 1.** Multi-channel infusion pump for delivery of chemotherapy.

Exposure to hazardous drugs may occur through inhalation, skin contact, skin absorption, ingestion, or injection. Inhalation or skin contact and absorption are the most likely ways a worker may be exposed to hazardous drugs. However, ingestion (from hand to mouth) or injection through a needlestick or sharps injury is possible.

## Medical Surveillance

A comprehensive approach to minimizing worker exposure should be used as part of a safety and health program that includes engineering controls, good work practices, and personal protective equipment (PPE) supported by a medical surveillance program. Medical surveillance involves collecting and interpreting data to detect changes in the health status of working populations potentially exposed to hazardous substances. The elements of a medical surveillance program are used to establish a baseline of workers' health and then monitor their future health as it relates to their potential exposure to hazardous agents.

Employers should ensure that health care workers who are exposed to hazardous drugs are routinely monitored as part of a medical surveillance program [ASHP 2006; OSHA 1999]. This includes workers who directly handle hazardous drugs such as nurses, pharmacists, and pharmacy technicians. In addition, other workers (e.g., nurses' aides, laundry workers) who may come directly into contact with patient wastes within 48 hours after a patient has received a hazardous drug should be included in a medical surveillance program.

## Elements of a Medical Surveillance Program

The elements of a medical surveillance program for hazardous drugs should include (at a minimum):

- Reproductive and general health questionnaires completed at the time of hire and periodically thereafter
- Laboratory work, including complete blood count and urinalysis completed at the time of hire and periodically thereafter. Additional tests, such as liver function and transaminase tests, may be considered.
- Physical examination completed at the time of hire and then as needed for any worker whose health questionnaire or blood work indicates an abnormal finding

- Followup for those workers who have shown health changes or have had a significant exposure (e.g., substantial skin contact, cleaning a large spill [a broken bag, leaking IV line], etc.)

Periodic health questionnaires and laboratory results should be looked at for trends that may be a sign of health changes because of exposure to hazardous drugs. If health changes are found, the employer should take the following actions:

- Evaluate current protective measures:
  1. Engineering controls (biological safety cabinets/isolators, ventilation, closed system transfer devices, and closed IV systems)
    - Compare performance of controls with recommended standards.
    - Conduct environmental sampling when analytical methods are available.
  2. Policies for the use of PPE and employee compliance with PPE use and policies
  3. Availability of appropriate PPE such as double gloves, nonpermeable gowns, and respiratory protection
- Develop plan of action that will prevent further employee exposure.
- Ensure confidential notification of any adverse health effect to an exposed worker and offer alternative duty or temporary reassignment.
- Provide ongoing medical surveillance of all workers at risk to determine whether the new plan is effective.

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## For More Information

NIOSH has published an Alert describing measures to control worker exposure to hazardous drugs: [www.cdc.gov/niosh/docs/2004-165/](http://www.cdc.gov/niosh/docs/2004-165/)

Additional information about hazardous drugs is available on the NIOSH Web site at [www.cdc.gov/niosh/topics/hazdrug/default.html](http://www.cdc.gov/niosh/topics/hazdrug/default.html). To receive copies of NIOSH publications, contact NIOSH at

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