CAUT Health and Safety Fact Sheet

Cytotoxic Drugs Fact Sheet

ISSUE 25

Cytotoxic drugs pose a unique hazard to healthcare workers and others. While these anti-cancer agents are intended to kill cancer cells in affected patients, anyone handling, giving or disposing of these drugs is especially vulnerable to developing cancer from being exposed to them because they can be just as harmful to healthy cells and tissue.[1] These drugs are also used in the treatment of some sexually transmitted and other diseases[2] – their use needs to follow the same procedures as if given for cancer treatment.

Rita Kwong, Pharmacy Site Operations Manager at Toronto's Princess Margaret Hospital (University Health Network) stresses that anyone working with cancer-causing agents must understand the hazards, have adequate training, and know how to protect themself by participating in their institutions training programs on cytotoxic drugs.

It is important for academic staff who teach and/or work in research and clinical settings to ensure that they, their staff and students have appropriate safety protocols in place both on campus and in community training settings.

The British Columbia Cancer Agency notes that "Although there are no specific screening techniques which indicate levels of exposure or to predict adverse health effects of exposure to cytotoxic agents, it is of paramount importance to take measures to protect the employee's health status."[3]

Please work with your Joint Health and Safety Committee (JHSC) to ensure that you have the most up to date information on cytotoxic hazards and the most effective methods to protect yourself and others.

Purpose

Cytotoxic drugs, also known as antineoplastic or chemotherapy drugs are used to kill or slow the growth of

Because of the dangers of cytotoxic drugs, strict precautions must be taken

For more information:
Laura Lozanski
Health and Safety Officer
CAUT
Tel.: (613) 820-2270
Fax: (613) 820-7244
Email: lozanski@caut.ca

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Canadian Association of University Teachers
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Ottawa, Ontario K2B 8K2
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cancerous cells in humans and animals.

In recent years, these drugs have been incorporated as an immunosuppressant in the treatment of patients undergoing transplants and diseases that have an immunological factor to them, such as HIV/AIDS and some sexually-transmitted diseases.

Antineoplastic Agents

Antineoplastics inhibit and combat the development of neoplasms.

CAREX (CARcinogen Exposure) Canada[4] notes that the occupational exposure limits for these commonly dispensed drugs[5] have not been located in Canada or internationally. CAREX consulted Health Canada's Drug Product Database to determine if these drugs are currently being distributed in Canada, in what forms, and by how many companies:

- Doxorubicim (Adriamycin)
- Chlorambucil
- Cisplatin
- Cyclophosphamide
- Melphalan

CAREX also notes that probable occupational exposures are in pharmacies, patient handling, research and education/teaching.

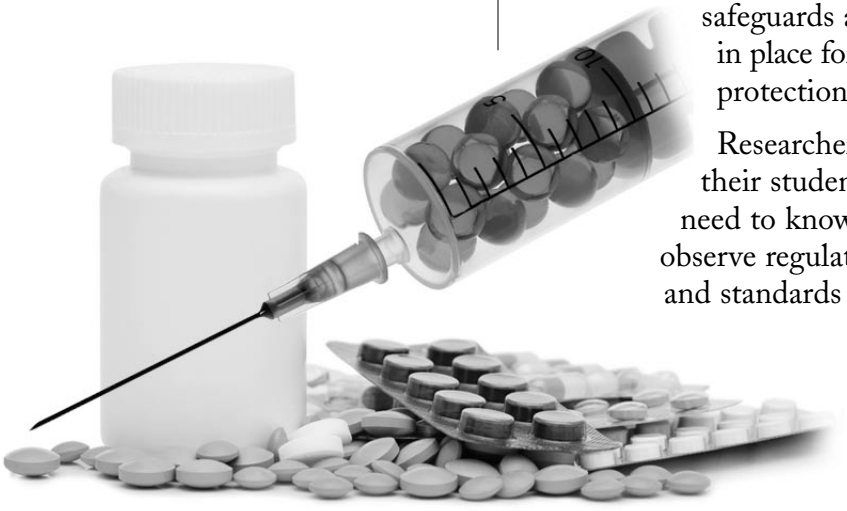
Hazards

Because of the dangers of cytotoxic drugs, strict precautions must be taken by the people administering them to protect themselves and others who must or may come in contact with them, including co-workers, students and cleaning staff.

Even among healthcare providers who dispense or administer these drugs in a controlled setting, there is rarely an area that is ideally controlled. These drugs are administered in paediatrics, geriatrics/rehabilitation, oncology, intensive care units, among others. They are routinely given in long-term care settings and patient's homes.

Clinical care faculty in human and veterinary medicine, nursing disciplines, and their students will need to work closely with the host institution to ensure that adequate and appropriate safeguards are in place for their protection.

Researchers and their students will need to know and observe regulations and standards in developing and working with these highly toxic and hazardous chemicals.



Patients and their family members are administering these drugs themselves in the home setting. Clinical faculty who supervise the health teaching for these patients and family members need to ensure that strict safety practices are taught and observed for all parties involved.

Exposure – Health Hazards

The Centre for Disease Control notes the following symptoms and disease outcomes can be linked to many studies[6] on worker exposure and environmental contamination:

Acute: skin, eyes and mucous membrane irritations; allergic reactions in skin contact; nausea, headaches and dizziness

Chronic or other: increased frequency of chromosome changes in exposed workers; increased incidences of spontaneous abortions, malformed fetuses and temporary or permanent infertility; damage to liver, kidney, lungs, heart, and hearing impairment.

Routes of Exposure

- Inhalation of drug dust or aerosol (drug preparation or administration)
- Absorption through the skin
- Needlestick injury

- Ingestion of drug contaminated food, drink or cigarettes
- Handling drug contaminated equipment and supplies
- Handling contaminated body waste

Who are at risk?

Pharmacists
Nurses
Physicians
Operating room staff
Veterinary staff
Researchers
Students
Family members
Shipping & receiving workers
Custodial and laundry workers
Waste handlers

Protection and Prevention

According to the CDC/ NIOSH there are currently no recommended exposure levels for cytotoxic drugs by NIOSH, OSHA or American Conference of Governmental Industrial Hygienists (AGIH), but they indicate:

"Some pharmaceutical manufacturers develop risk-based occupational exposure limits (OELs) to be used in their own manufacturing settings, and this information may be available on material safety data sheets (MSDS) or from the manufacturer."

Each workplace (campus, community clinical setting, patient's home, or manufacturer) must have a written policy in place that ensures the health and safety of faculty, students, patients and others who may become exposed to the hazardous effects of cytotoxic drugs. A comprehensive plan that provides clear and concise information on how to safely handle, dispense and dispose of these drugs that meets internationally accepted standards and national or provincial regulations is essential for workplace health and safety.

Main Components of Worker Protection Plan:

- Cytotoxic drugs identified as an occupational hazard
- Identify work area(s) where handled and dispensed
- Prevention of exposure
- Medical surveillance
- Effective and timely communication
- Training and information
- Documentation

The following list highlights many of the critical tasks that require information and training for optimum protection for everyone coming into contact with cytotoxic drugs – please consult your institution's plan for their details:

- Policy
- Preparation
- Transportation
- Storage – Class II or Class III
- Labeling
- Drug Administration
- PPE – gloves, disposable gown, fluid-resistant mask
- Waste Disposal
- Body Wastes
- Linens
- Cytotoxic Spills – Spill kits
- Eye Splashes
- Work Environment
- Education and Training
- Patient Information

The Toolkit section included in this fact sheet will link you to detailed standard and regulated practices for these and other tasks.

Gloves

Gloves must meet ASTM (American Society for Testing and Materials) standards, be powder free and worn doubled.

Toolkit

Canadian Society of Hospital Pharmacists – Hazardous Pharmaceuticals (Including Cytotoxic Drugs): Guidelines for Handling and Disposal (1997) www.cshp.ca

CDC/NIOSH: Drugs in Health Care Settings, Medical Surveillance for Health Care Workers Exposed to Hazardous Drug, Personal Protective Equipment for Health Care Workers Who Work With Hazardous Drugs, Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings www.cdc.gov/niosh

Cytotoxic Drugs, Government of Saskatchewan www.publications.gov.sk.ca

Guideline C-4: The Management of Biomedical Waste in Ontario, November 2009 www.ene.gov.on.ca/publications/7397e.pdf

Guidelines for the Handling and Disposal of Hazardous Pharmaceuticals (Including Cytotoxic Drugs) 1997, Canadian Society of Hospital Pharmacists

Resources

British Columbia Cancer Agency www.bccrc.ca

CAREX Canada www.carexcanada.ca/antineoplastic_agents/occupational_exposures

CSA – Handling of waste materials in health care facilities and veterinary health care facilities Z317.10-09 www.csa.ca

Guidelines for the Safe Handling of Cytotoxic Drugs and Related Waste, Department of Labour, New Zealand www.dol.gov.nz

IARC (International Agency for Research on Cancer) www.irac.org

Occupational Health & Safety Agency for Healthcare in British Columbia www.ohsah.bc.ca

Safe handling of cytotoxic drugs, HSE Information Sheet MISC615, UK www.hse.gov.uk

Princess Margaret Hospital, University Health Network, Toronto (chemotherapy pharmacy department) www.uhn.ca/pmh

Notes

1 CDC/NIOSH Occupational Exposure to Antineoplastic Agents

2 Public Health Agency of Canada, Canadian STD Guidelines www.phac-aspc.gc.ca

3 British Columbia Cancer Agency, Policy Number: V-20, Employee Health: Management of Risks Related to Cytotoxic Agents

4 CAREX Canada, Antineoplastic Agents – Occupational Exposure Estimates – Phase I

5 Health Canada Drug Product Database www.hc-sc.gc.ca/dhp-mps/prodpharma/databasdon

6 CDC/NIOSH Occupational Exposure to Antineoplastic Agents