London Health Sciences Centre

Safe Handling of Hazardous Drugs

Staff Education
May 1, 2015

Safe Handling of Hazardous Drugs

Most hospitals have policies & procedures for the handling of cytotoxic drugs (chemotherapy)…

But what about those other drugs….

Other medications that have been acknowledged as potentially hazardous

Goals

1. Understand what information is in the new Safe Handling of Hazardous Medications Policy.
2. Define what a Hazardous Medication is and what some of the risks of occupational exposure are.
3. Use the policy to determine:
   - ✓ the classification of the Hazardous Medication
   - ✓ the dosage form of the Hazardous Medication
   - ✓ how that impacts the handling precautions
   - ✓ required to minimize occupational exposure.

Goal of Policy

- ✓ To establish processes and requirements to support the safe handling of hazardous drugs, including procurement, transport, preparation, dispensing, administration, clean-up (spills) and disposal.

WHO does this policy apply to?

- **ALL** employees providing direct care to

patients receiving Hazardous Medications (nursing assistants, nurses, physicians, physiotherapy, etc.).

- **ALL** employees handling or transporting medication, waste or soiled equipment (e.g. housekeeping, laundry, transport, pharmacy, shipping and receiving, etc.).

WHEN Does this Policy Apply

Greatest risk activities: preparation and administration of medication.

Lesser risk activities: handling human waste of patients known to have received a hazardous medication in the last 48 hours.

Staff should ensure they are wearing appropriate personal protective equipment (PPE) for each of these levels of exposure.

Hazardous Drugs

Medications that are known or suspected to cause adverse health effects from exposures in the workplace.

They include:

- ✓ Antineoplastic and chemotherapy medications used for cancer and other diseases
- ✓ Medications to treat auto immune diseases like arthritis
- ✓ Some antiviral medications, hormones, some bioengineered medication & other miscellaneous medications.

Cytotoxic and Non-Cytotoxic Hazardous Drugs

Cytotoxic Hazardous Drug	NON-Cytotoxic Hazardous Drug
• Drugs that are detrimental or destructive to cells within the body (e.g. cytotoxic, mutagenic, genotoxic or carcinogenic). These agents are commonly used in cancer treatment but may also be used for other disorders. • Deemed to pose maximal risk in the event of occupational exposure.	• Medications (other than cytotoxic hazardous medications) that adversely affect the reproductive system (e.g. teratogenicity, impaired fertility), endocrine system, immune system, respiratory system or have potential to transmit infection. • Deemed to pose a potential risk in the event of occupational exposure and require special handling precautions

What are the POTENTIAL Risks to Health Care Workers?

Working with or near hazardous medications in health care settings can **potentially** cause:

- ✓ Skin rashes
- ✓ Infertility
- ✓ Miscarriage
- ✓ Birth defects
- ✓ Organ toxicities
- ✓ Leukemia or other cancers

How Would I Come into Contact with a Hazardous Drug?

Direct contact

- Primary physical contact with a hazardous medication during preparation or administration or when managing a hazardous medication spill.
- Touching measurable concentrations of medications present on drug vial exteriors, work surfaces, floors, and final medication products?

Indirect Contact

- Secondary contact with a hazardous medication from body fluids, bed linens, medical equipment, etc.
- Changing the diaper of a baby receiving cytotoxic medication for leukemia

There are 3 Key Steps to Consider When Handling Hazardous Drugs

Step 1 – Determine if the drug is on the Hazardous Drugs List and if it is Cytotoxic or Non-Cytotoxic (Appendix A)

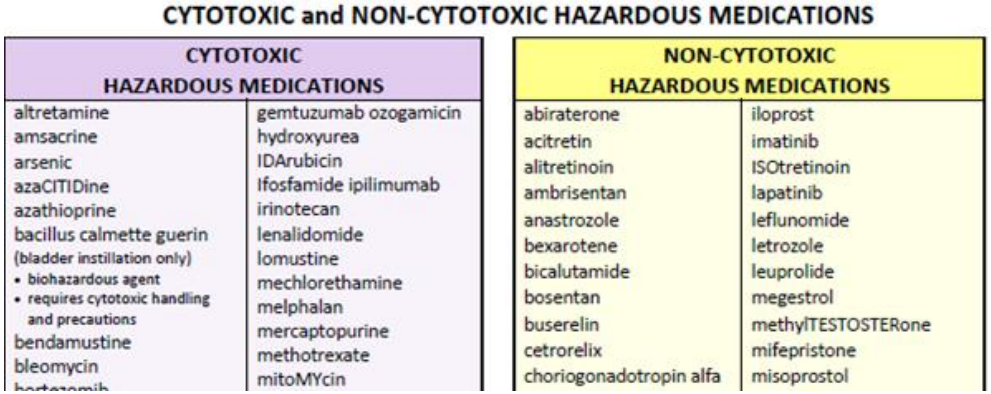
Step 2 - Determine the dose form of the drug that you are going to handle.

Step 3 – Refer to the Handling Precautions for Hazardous Drug Chart (Appendix B) and follow directions for the process you are about to complete.

Step 1 - Is the medication that I'm handling Hazardous?

There are **4** ways that you can learn if the drug you are handling is Hazardous…

1 – Refer to the Cytotoxic and NON-Cytotoxic Hazardous Drug List (Appendix A)

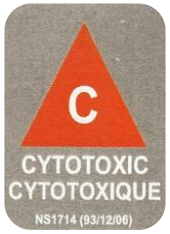


CYTOTOXIC and NON-CYTOTOXIC HAZARDOUS MEDICATIONS

CYTOTOXIC HAZARDOUS MEDICATIONS	
altretamine	gemtuzumab ozogamicin
amsacrine	hydroxyurea
arsenic	IDArubicin
azaCITIDine	Ifosfamide ipilimumab
azathioprine	irinotecan
bacillus calmette guerin (bladder instillation only) • biohazardous agent • requires cytotoxic handling and precautions	lenalidomide
	lomustine
	mechlorethamine
	melphalan
bendamustine	mercaptopurine
bleomycin	methotrexate
bortezomib	mitoMYcin

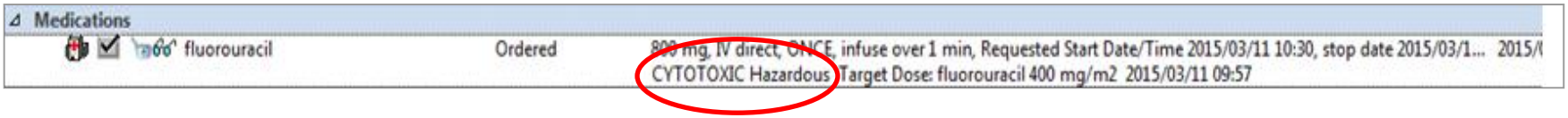
NON-CYTOTOXIC HAZARDOUS MEDICATIONS	
abiraterone	iloprost
acitretin	imatinib
alitretinoin	ISOtretinoin
ambrisentan	lapatinib
anastrozole	leflunomide
bexarotene	letrozole
bicalutamide	leuprolide
bosentan	megestrol
buserelin	methylTESTOSTERone
cetrorelix	mifepristone
choriogonadotropin alfa	misoprostol

Step 1 - Is the medication that I'm handling Hazardous?

2. Look for a symbol: 

or 

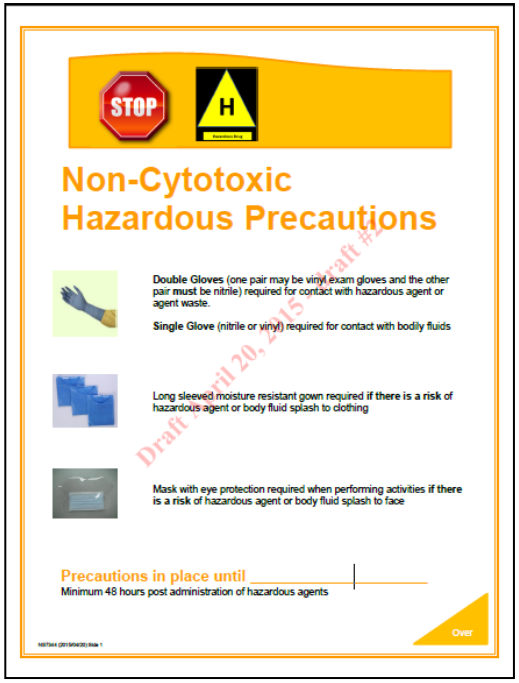
3. Refer to the orders tab:

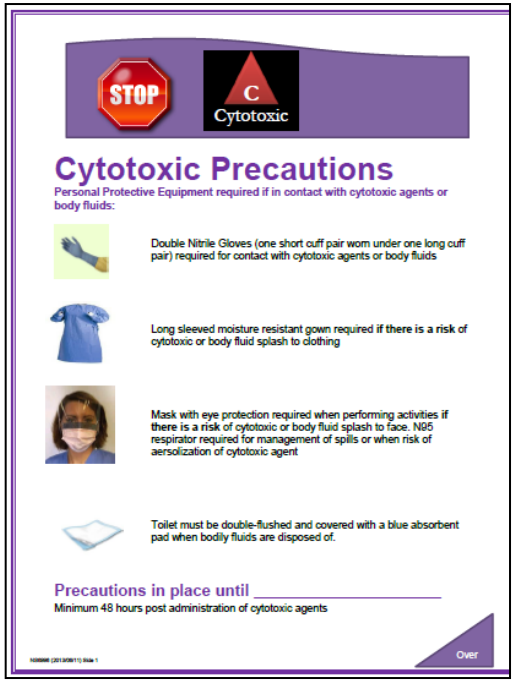


4. Refer to the eMAR:

Step 1

- You will also know that the patient you are caring for has received a hazardous drug and that you need to take precautions, by the Precaution sign outside of the patients room

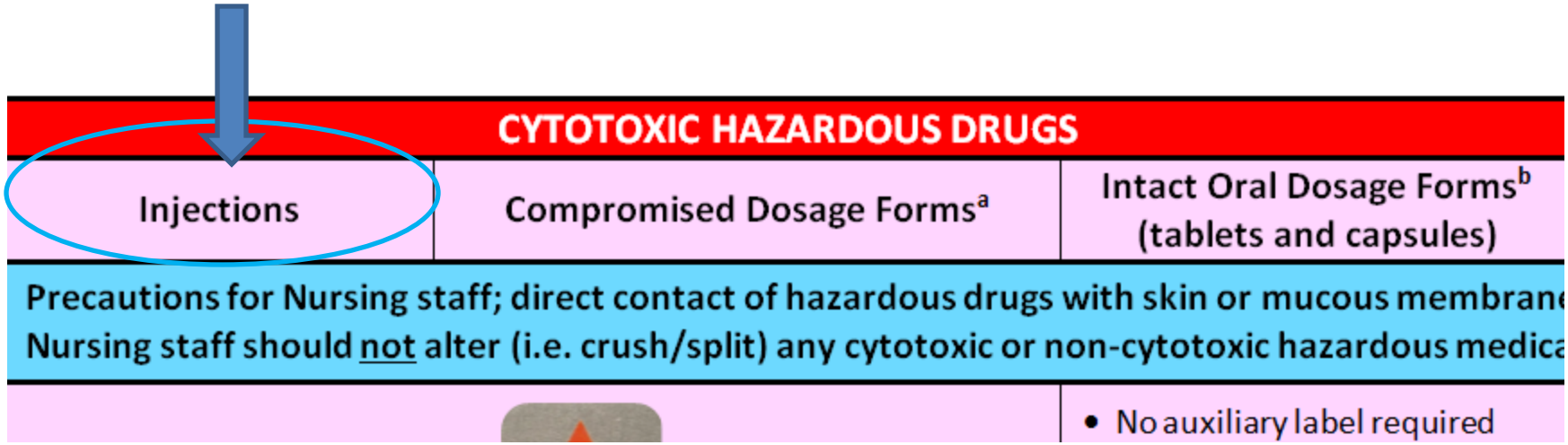




Step 2 – Determine Dosage Form

Is this drug an **Injectable** dosage form? (e.g. IV, IM, SQ, IT, bladder instillation etc.)

Refer to the **Injections** section of the handling precautions chart:

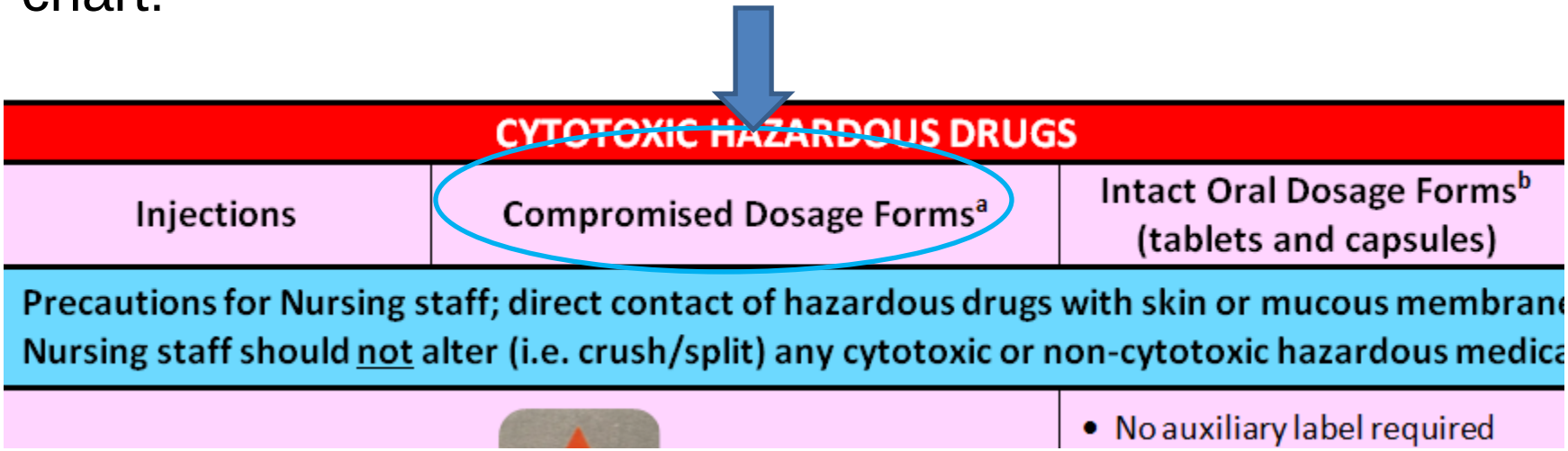


CYTOTOXIC HAZARDOUS DRUGS		
Injections	Compromised Dosage Forms[a]	Intact Oral Dosage Forms[b] (tablets and capsules)
Precautions for Nursing staff; direct contact of hazardous drugs with skin or mucous membrane Nursing staff should not alter (i.e. crush/split) any cytotoxic or non-cytotoxic hazardous medica		
		• No auxiliary label required

Step 2 – Determine Dosage Form

Is it a **Compromised dosage** form? (e.g. oral liquids, splitting, crushing a tablet, opening a capsule, compounding, dissolve-and administer and topical products).

Refer to the **Compromised Dosage Form** section of the chart:



Step 2 - Compromised Dose Forms

- Pharmacy will purchase or prepare a liquid dosage form if required for your patient.
- If this is not available, they may suggest the *Dissolve-and-Administer (refer to Appendix C)*
- Contact pharmacy for full instructions on using this method and to ensure that the medication can be administered in this manner.

Dissolve-and-Administer

Dissolve-and-administer to be prepared by nurse on floor when:
- **Tablet(s)/capsule(s) easily dissolve in water AND**
- **Total resultant volume is to be administered**

(See Section 1)

Dissolve-and-administer is to be prepared by pharmacy when:
- **Tablet(s)/capsule(s) must be crushed/opened OR**
- **Partial resultant volume is to be administered**

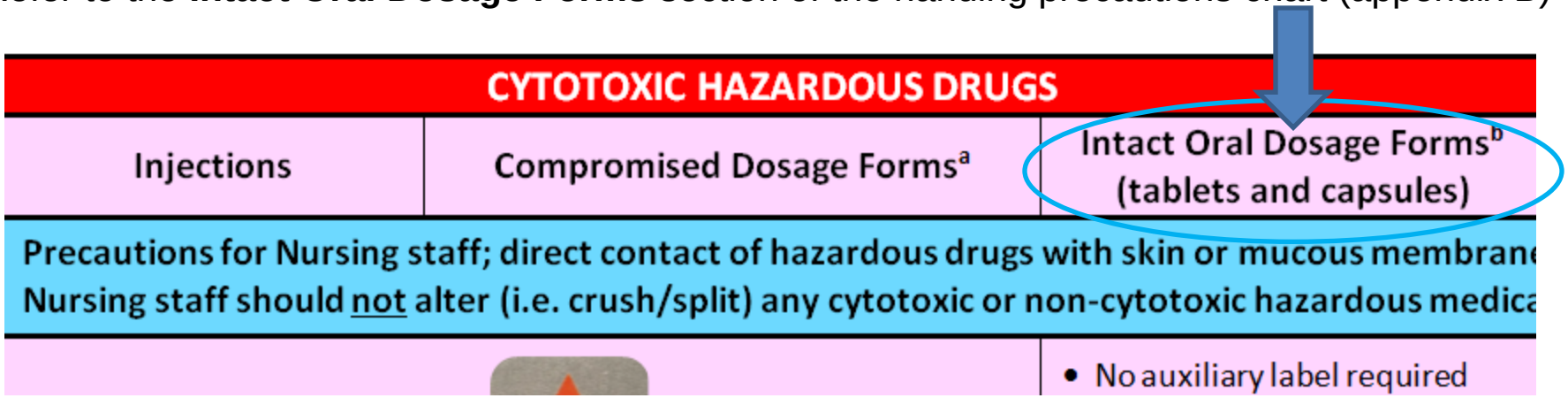
(See Sections 2-4)

Procedure for Nursing:
Don PPE and arrange materials on plastic-backed pad at the patient's bedside
Remove plunger from oral syringe
Place tablets/capsule in syringe without crushing/opening
Insert plunger into syringe barrel
Draw water into syringe as directed then draw additional 1mL of air.
Place cap on tip of syringe
Shake syringe and let sit for 2-5 minutes, then shake again to dissolve
Administer dose directly from syringe
Draw up additional water into syringe, shake and administer to ensure entire dose given
Discard syringe into appropriate disposal

Step 2 – Determine Dosage Form

Is the drug in an oral solid, intact dosage form? (e.g. tablet or capsule) and supplied as a “Unit Dose” package, no further manipulation of drug is required

Refer to the **Intact Oral Dosage Forms** section of the handing precautions chart (appendix B)



CYTOTOXIC HAZARDOUS DRUGS		
Injections	Compromised Dosage Forms[a]	Intact Oral Dosage Forms[b] (tablets and capsules)
Precautions for Nursing staff; direct contact of hazardous drugs with skin or mucous membrane Nursing staff should not alter (i.e. crush/split) any cytotoxic or non-cytotoxic hazardous medica		
		• No auxiliary label required

NOTE: If a solid oral intact dosage form is not appropriate for administration to your patient (cannot swallow tablet, medication is administered through a feeding tube, etc.)

DO NOT CRUSH TABLET or OPEN CAPSULE

and

Contact pharmacy for assistance

Step 3 – Follow the Handling Precautions

Referring to the Handling Precautions for Hazardous Drugs Chart (Appendix) find the process you are about to complete for the specified category of drug and follow the instructions.

e.g. For cyclophosphamide injection the nurse would follow the instructions circled here:

	CYTOTOXIC HAZARDOUS DRUGS		
	Injections	Compromised Dosage Forms[a]	Intact Oral Dosage Forms[b] (tablets and capsules)
ADMINISTRATION & DISPOSAL	Precautions for Nursing staff; direct contact of hazardous drugs with skin or mucous membranes Nursing staff should not alter (i.e. crush/split) any cytotoxic or non-cytotoxic hazardous medicat		
Identification labeling as supplied by Pharmacy and as identified on the Medication Administration Record			• No auxiliary label required • As shown on MAR • Cytotoxic Precautions – Handle and Dispose of as per policy
Handling precautions	• Double gloves[c] • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid resistant mask in "High Risk" situation[e]		• Double gloves[c]
	Supplied as Ready to administer[g] from pharmacy (except dissolve and administer – See Appendix C[h])		
Drug Packaging Disposal and Drug Waste	• Approved Cytotoxic Waste container		
Waste Drug Handling (protective wear)	• Double gloves[c] • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid Resistant mask for in "High Risk" situation[e]		• Double gloves[c]
Patient Blood and Body Fluids Handling	• Double gloves[c] • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid Resistant mask in "High Risk" situation[e]		
Patient Blood and Body Fluids Handling and Contaminated Supplies Disposal	• Toilet for urine, feces, emesis - double flush • Approved Cytotoxic Waste Container contaminated supplies (e.g. IV tubing, used PPE, incontinence pads, saturated linen, disposable patient care items e.g. urinals, bedpans) • All other supplies, apply routine practices for cleaning, and disposal		

Summary – Key Points

- Hazardous medications can potentially cause harm to workers.
- Hazardous medications can be classified as cytotoxic and non-cytotoxic.
- There are 3 steps staff members need to be aware of when handling these agents.

Other Key Points

- Be familiar with the policy.
- Report any exposure (direct and indirect contact / skin puncture) with hazardous medication to immediate supervisor and complete AEMS
- Discuss concerns about pregnancy, breast-feeding or planned pregnancy with your supervisor - may lead to temporary reassignment.

THE LIST
Appendix A

CYTOTOXIC and NON-CYTOTOXIC HAZARDOUS MEDICATIONS

CYTOTOXIC HAZARDOUS MEDICATIONS

altretamine
amsacrine
arsenic
azaCITIDine
azathioprine
bacillus calmette guerin (bladder instillation only)
- biohazardous agent
- requires cytotoxic handling and precautions

bendamustine
bleomycin
bortezomib
brentuximab vedotin
busulfan
capecitabine
carbazetaxel
CARBOplatin
Carmustine
chlorambucil
CISplatin
cladribine
clofarabine
crizotinib
cyclophosphamide
cytarabine
dacarbazine
DACTINomycin
DAUNOrubicin
decitabine
dexrazoxane
DOCEtaxel
DOXOrubicin
DOXOrubicin liposomal
Epirubicin
eribulin
estramustine
etoposide
floxuridine
flucytosine
fludarabine
fluorouracil
ganciclovir
gemcitabine
gemtuzumab ozogamicin
hydroxyurea
IDArubicin
Ifosfamide ipilimumab
irinotecan
lenalidomide
lomustine
mechlorethamine
melphalan
mercaptopurine
methotrexate
mitoMYcin
mitotane
mitoXANtrone
nab-paclitaxel
nelarabine
oxaliplatin
PACLitaxel
PEMEtrexed
pentostatin
procarbazine
raltitrexed
SORAfenib
streptozocin
SUNItinib
temozolomide
temsirolimus
teniposide
thalidomide
thioguanine
thiotepa
topotecan
trastuzumab emtansine
uracil mustard
valGANciclovir
valrubicin
vandetanib
vemurafenib
vinBLAStine
vinCRIStine
vindesine
vinorelbine

NON-CYTOTOXIC HAZARDOUS MEDICATIONS

abiraterone
acitretin
alitretinoin
ambrisentan
anastrozole
bexarotene
bicalutamide
bosentan
buserelin
cetrorelix
choriogonadotropin alfa
cidofovir
colchicine
cycloSPORINE
cyproterone
dasatinib
degarelix
dinoprostone
dutasteride
enzalutamide
erlotinib
everolimus
exemestane
finasteride
fingolimod
fluoxymesterone
flutamide
foscarnet
fulvestrant
ganirelix
gefitinib
goserelin
iloprost
imatinib
ISOtretinoin
lapatinib
leflunomide
letrozole
leuprolide
megestrol
methylTESTOSTERone
mifepristone
misoprostol
mycophenolate
nafarelin
nilotinib
nilutamide
oxandrolone
pentamidine (aerosol only)
plerixafor
raloxifene
ribavirin
ruxolitinib
sirolimus
tacrolimus
tamoxifen
testosterone
tofacitinib
trastuzumab
tretinoin
triptorelin
ulipristal
zidovudine

HANDLING
Appendix B

Appendix B - Handling Precautions for Hazardous Drugs

	CYTOTOXIC HAZARDOUS DRUGS			NON-CYTOTOXIC HAZARDOUS DRUGS		
DEFINITIONS	**Refer to Appendix A: Cytotoxic and Non-Cytotoxic Hazardous Drugs List.**					
	Cytotoxic Hazardous Drugs (CHDs) - drugs that are detrimental or destructive to cells within the body. These agents are commonly used in cancer treatment but may also be used for other disorders. CHDs may be cytotoxic mutagenic, genotoxic or carcinogenic.			Non-Cytotoxic Hazardous Drugs - drugs which are hazardous, but not cytotoxic, pose a different risk in general than cytotoxic drugs and require specific handling precautions. Non-cytotoxic hazardous drugs may affect the reproductive system (e.g. teratogenicity, impaired fertility), endocrine system, immune system, respiratory system or have potential to transmit infection.		
	Injections	**Compromised Dosage Forms[a]**	**Intact Oral Dosage Forms[b] (tablets and capsules)**	**Injections**	**Compromised Dosage Forms[a]**	**Intact Oral Dosage Forms[b] (tablets and capsules)**
RECEIVING PRECAUTIONS	**Precautions for personnel receiving shipments at loading dock and delivering to pharmacy; containers identified with a hazardous/cytotoxic warning label.**					
Original packing and packaging intact	• No special precautions (gloves available)			• No special precautions		
Visibly damaged shipment	• Initiate Universal Spill Procedure, notify Pharmacy Coordinator of damaged package			• Notify Pharmacy Coordinator		
UNPACKING PRECAUTIONS	**Precautions for pharmacy personnel unpacking shipping containers; packing slip information should be reviewed for contents prior to unpacking.**					
Original packing and packaging intact	• Gloves and approved chemotherapy gown			• No special requirements		
Visibly damaged shipment	• Initiate Universal Spill Procedure, if possible take picture of damaged product then discard, notify pharmacy coordinator			• Initiate Universal Spill Procedure , if possible take picture of damaged product then discard, notify Pharmacy Coordinator		
Drug Packaging Disposal	• Approved Cytotoxic waste container			• Approved Cytotoxic waste container		
PREPARATION PRECAUTIONS	**Precautions for Pharmacy personnel; Nursing staff should <u>not</u> alter (i.e. crush/split tablets, open capsules) any cytotoxic or non-cytotoxic hazardous medication - please contact Pharmacy.**					
Preparation by	**Pharmacy ONLY (except dissolve and administer – See Appendix C[h])**			**Pharmacy ONLY (except dissolve and administer – See Appendix C[h])**		
Preparation area	• Class II Biological Safety Cabinet **and** Closed System Device[d] where available	• Designated cytotoxic packaging area[f] (VH Manufacturing only) • Class II Biological Safety Cabinet	• Designated cytotoxic packaging area[f]	• Regular clean room procedures	• Designated Hazardous packaging area[f] (VH Manufacturing only) • Class II Biological Safety Cabinet	• Designated Hazardous packaging area[f] (VH manufacturing only)
Protective wear for preparing drug	• Double gloves[c], approved chemotherapy gown, bonnet and surgical mask	• Double gloves[c], approved chemotherapy gown, bonnet and surgical mask	• Single nitrile gloves, approved chemotherapy gown in designated packaging area[g]	• Proper PPE for IV Prep (isolation gown, gloves and surgical mask)	• Double gloves[c], approved chemotherapy gown, bonnet and surgical mask	• Single nitrile gloves
Protective wear for cleanup of preparation area	• Full PPE (gloves, approved chemotherapy gown, bonnet, N95 mask, eye shield) required for cleaning Biological Safety Cabinet		• Single nitrile gloves, approved chemotherapy gown in designated packaging area[g]	• Proper PPE for IV Prep (isolation gown, gloves and surgical mask)	• Full PPE (gloves, approved chemotherapy gown, bonnet, N95 mask, eye shield) required for cleaning Biological Safety Cabinet	• Single nitrile gloves
Packaging format	**Ready to Administer[g] (except dissolve and administer – See Appendix C[h])**			**Ready to Administer[g] (except dissolve and administer – See Appendix C[h])**		
Labeling requirements (for drugs to be used in patient care area)			• No auxiliary label required • As shown on MAR • Cytotoxic – Handle and Dispose of as per policy			• No auxiliary label required • As shown on MAR • Hazardous Drug – Handle and Dispose of as per policy
Packaging for transport to patient care area	• Closed leak-proof plastic bags (Ziploc®) and identified with Cytotoxic Drug Symbol		• No auxiliary label required • As shown on MAR • Cytotoxic Precautions – Handle and Dispose of as per policy	• Closed leak-proof plastic bags (Ziploc®) and identified with Hazardous Drug Symbol		• No auxiliary label required • As shown on MAR • Hazardous Drug – Handle and Dispose of as per policy
Packaging for transport to other pharmacy area or external pharmacy)	• Closed leak-proof plastic bags (Ziploc®) and identified with Cytotoxic Drug Symbol • Separate from other drugs • Transport should be in a rigid container, labeled with Cytotoxic Symbol (for specified areas)		• Dosage form labeled with Cytotoxic Symbol	• Closed leak-proof plastic bags (Ziploc®) and identified with Hazardous Drug Symbol • Separate from other drugs • Transport should be in a rigid container, labeled with Hazardous Symbol (for specified areas)		• Dosage form labeled with Hazardous Symbol

HANDLING page 2
Appendix B

	CYTOTOXIC HAZARDOUS DRUGS			NON-CYTOTOXIC HAZARDOUS DRUGS		
	Injections	**Compromised Dosage Forms[a]**	**Intact Oral Dosage Forms[b] (tablets and capsules)**	**Injections**	**Compromised Dosage Forms[a]**	**Intact Oral Dosage Forms[b] (tablets and capsules)**
ADMINISTRATION & DISPOSAL	**Precautions for Nursing staff; direct contact of hazardous drugs with skin or mucous membranes must be avoided at all times (refer to Accidental Spill Policy). Nursing staff should not alter (i.e. crush/split) any cytotoxic or non-cytotoxic hazardous medication (please contact Pharmacy if special requirements are needed).**					
Identification labeling as supplied by Pharmacy and as identified on the Medication Administration Record			• No auxiliary label required • As shown on MAR • Cytotoxic Precautions – Handle and Dispose of as per policy			• No auxiliary label required • As shown on MAR • Hazardous Drug – Handle and Dispose of as per policy
Handling precautions	• Double gloves[c] • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid resistant mask in "High Risk" situation[e]		• Double gloves[c]	• Double gloves[c] • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid resistant mask "High Risk" situation[e]		• Single gloves
	Supplied as Ready to administer[g] from pharmacy (except dissolve and administer – See Appendix C[h])			**Supplied as Ready to administer[g] from pharmacy (except dissolve and administer – See Appendix C[h])**		
Drug Packaging Disposal and Drug Waste	• Approved Cytotoxic Waste container			• Approved Biohazard Waste container		• Approved Pharmaceutical Waste container
Waste Drug Handling (protective wear)	• Double gloves[c] • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid Resistant mask for in "High Risk" situation[e]		• Double gloves[c]	• Double gloves[c] • Approved chemotherapy gown, • Safety goggles or face shield in "High Risk" situation[e] • Fluid Resistant mask in "High Risk" situation[e]		• Single gloves
Patient Blood and Body Fluids Handling	• Double gloves[c] • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid Resistant mask in "High Risk" situation[e]			• Routine practice (single glove-nitrile/vinyl) • Approved chemotherapy gown • Safety goggles or face shield in "High Risk" situation[e] • Fluid resistant mask in "High Risk" situation[e]		
Patient Blood and Body Fluids Handling and Contaminated Supplies Disposal	• Toilet for urine, feces, emesis - double flush • Approved Cytotoxic Waste Container contaminated supplies (e.g. IV tubing, used PPE, incontinence pads, saturated linen, disposable patient care items - e.g. urinals, bedpans) • All other supplies, apply routine practices for cleaning, and disposal			• Routine practices for blood and body fluids (e.g. Urine, feces emesis in toilet) • Approved Pharmaceutical Waste Container for contaminated supplies (e.g. IV tubing, used PPE, drug packaging) • All other supplies, apply routine practices for cleaning or disposal		
SPILL MANAGEMENT						
Spill management Requirements	**All spills must be handled by trained staff. If beyond your control call Code Brown.**			**All spills must be handled by trained staff. If beyond your control call Code Brown.**		

*Refer to: Management of Cytotoxic Spills

GLOSSARY OF TERMS

a. Compromised Dosage Form – includes drug products under the following conditions: counting (anything not unit dose packaging from manufacturer), oral liquids, splitting, crushing a tablet, opening a capsule, compounding, dissolve-and administer (Appendix C), and topical products

b. Intact Oral Dosage Forms (tablets and capsules) – supplied as a "Unit Dose" package, no further manipulation of drug is required

c. Double Gloves - When two pairs of gloves are recommended, gloves can be of different materials but should both be chemo approved material such as nitrile, polyurethane or neoprene.

d. Closed System - commercial system that allows reconstitution and withdrawal of a liquid medication from a vial without risk of aerosolization or contamination of the worker or surroundings.

e. "High-risk" situation - e.g. agitated patient or if there is a chance of splash or spray

f. Designated Cytotoxic Packaging area (VH Manufacturing area by trained personnel only)

g. Ready to administer – no further manipulation of the drug is required

h. See Appendix C for dissolve and administer instructions.

Resources

- Link for policy: https://apps.lhsc.on.ca/lhsc-policy/search_res.php?polid=PCC091&live=1

- Contact a member of out team if you have questions

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Questions?