HAZARDOUS MEDICATION EDUCATION

2019

OBJECTIVES

- At the completion of this learning module, you will be able to:
  - Define “hazardous” including cytotoxic medications and other agents included in this category of medications
  - Identify potential health risks to those who prepare, administer, transport, and/or care for patients receiving these medications
  - Identify safe handling procedures for hazardous medications
  - Identify the contents of a chemotherapy spill kit
  - Describe medical surveillance for associates exposed to cytotoxic medications
1.4 HAZARDOUS Medications Defined

HAZARDOUS MEDICATIONS DEFINED

Hazardous medications include many different classes of medications

- Cytotoxic (Antineoplastic)
- Non-Cytotoxic
  - Biologic
  - Antiviral
  - Hormones
  - Anti-Infective
  - Immunosuppressive agents
1.5 Handling Risks

Hazardous medications are capable of causing harm to anyone who comes into contact with them due to the following characteristics of these medications:

- Carcinogenicity
- Teratogenicity or developmental toxicity
- Reproductive toxicity
- Organ toxicity
- Genotoxicity

Hover over each term to learn more!
HANDLING RISKS

- Hazardous medications are capable of causing harm to anyone who comes into contact with them due to the following characteristics of these medications:
  - Carcinogenicity
  - Teratogenicity or developmental toxicity
  - Reproductive toxicity
  - Organ toxicity
  - Genotoxicity

Hover over each term to learn more!

Medications that may cause birth defects via a toxic effect on an embryo or fetus. This includes growth impedance, delayed mental development or other congenital disorders without any structural malformations.

HANDLING RISKS

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Hover over each term to learn more!

Adverse reproductive outcomes, including miscarriage, infertility, preterm births, disruptions in menstrual cycles, and learning disabilities.
HANDLING RISKS

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  - Carcinogenicity
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Organ damage related to toxicity is seen at low doses of drug

Hover over each term to learn more!

HANDLING RISKS

- Hazardous medications are capable of causing harm to anyone who comes into contact with them due to the following characteristics of these medications:
  - Carcinogenicity
  - Teratogenicity or developmental toxicity
  - Reproductive toxicity
  - Organ toxicity
  - Genotoxicity

Agents known to damage DNA

Hover over each term to learn more!
1.6 Potential situations for exposure

- Expelling air from syringes filled with hazardous medications
- Administering hazardous medications by intramuscular, subcutaneous, or intravenous (IV) routes
- Retrieving an uncoated tablet from a patient’s home multidose vial of medication
- Crushing tablets or opening capsules to make liquid formulations
- Generating aerosols while administering medications, either by direct IV push or by IV infusion
- Handling body fluids or body-fluid-contaminated clothing, dressings, linens, and other materials
- Handling contaminated wastes generated at any step of the preparation or administration process
- Performing certain specialized procedures (such as intraperitoneal chemotherapy)
- Handling unused hazardous medications or hazardous-drug-contaminated waste
- Decontaminating and cleaning drug preparation or clinical areas
- Removing & disposing of personal protective equipment after handling hazardous medications or waste

1.7 Routes of Exposure

Exposures to hazardous medications may occur through inhalation, ingestion, skin contact or injection.
Exposures to hazardous medications may occur through inhalation, ingestion, skin contact or injection. Inhalation and skin contact/absorption are the most likely routes of exposure.

Unintentional ingestion from hand-to-mouth contact.
1.8 Untitled Slide

The National Institute for Occupational Safety and Health (NIOSH) compiled a common list of hazardous medications from several institutions and has made several updates to the list since its first published in 2004.

The current update (2016) adds 34 drugs, five of which have safe-handling recommendations from Manufacturers.

The NIOSH list will be updated in June 2019.

Notes:

Joan to look for 2018 update when she returns
1.9 Cytotoxic (Antineoplastic) medications

Cytotoxic medications work by inhibiting the growth and development of cells resulting in cell death.

- Cells that are rapidly dividing, such as cancer cells, are most susceptible to cytotoxic medications.
- Side effects may result when other normal cells that are rapidly dividing are killed:
  - Hair follicles and finger nails
  - Mucous membranes—throughout GI
  - Bone marrow
  - And…cells of reproduction

1.10 Cytotoxic (antineoplastic) medications

Cytotoxic medications may be used in the treatment of cancer, sickle cell disease, and other conditions.

- Cytotoxic medications may also be referred to as chemotherapy or antineoplastic agents.
1.11 Examples of cytotoxic hazardous medications

EXAMPLES OF CYTOTOXIC HAZARDOUS MEDICATIONS

- Bacillus Calmette Guerin (BCG)
- Methotrexate
- Megestrol
- Hydroxyurea
- Xeloda (Capcitabine)

1.12 How to Identify cytotoxic medications

HOW TO IDENTIFY CYTOTOXIC MEDICATIONS

Cytotoxic medications are labeled in a variety of ways throughout our systems but all are designed to alert caregivers that the medications require special handling and precautions.

Notes:

ADD PYXIS PHOTOS
1.13 True or false

Some hazardous medications are non-cytotoxic but still require handling precautions.

True

False

Correct!
Some medications are not cytotoxic but are hazardous. All hazardous medication require handling precautions.
1.14 Examples of non-cytotoxic hazardous medications

- Cyclosporine
- Estrogen/ Progesterone combinations
- Ganciclovir
- Fosphenytoin
- Phenytoin
- Spironolactone
1.15 Examples of non-cytotoxic hazardous medications that primarily have adverse reproductive effects

Examples of Non-cytotoxic Hazardous Medications That Primarily Have Adverse Reproductive Effects

- Acitretin (vitamin A)
- Clonazepam
- Fluconazole
- Oxytocin
- Warfarin
- Zoledronic acid

1.16 Identifying hazardous medications

Identifying Hazardous Medications

- Label may be affixed to the medication packaging
- Drug reference sheet
- Safety data sheets
  - Available on the Intranet
- Cytotoxic medications have additional labeling

Notes:
1.17 Safe handling of hazardous agents

SAFE HANDLING OF HAZARDOUS AGENTS

Personal Protective Equipment (PPE)
Hazardous medications require personal protective equipment be worn during the following activities:
- Preparing hazardous medications for administration
- Administering by any route
- Disposing of hazardous medications and contaminated items
- Cleaning of hazardous spills
- For cytotoxics only: handling body fluids of patients who have received cytotoxic drug in the past 48 hours

Transporting Hazardous Medications
Non-oral hazardous medications must be transported in a clearly labeled, protective container (shown above)

Notes:

ADD TACKLEBOX PHOTO
1.18 Personal protective equipment (PPE): Gloves

Wear two pairs of gloves when handling:
- Oral liquid
- Topical
- Subcutaneous
- Intramuscular
- Intravenous
- Powders and solution for inhalation

Wear one pair of gloves when handling:
- Intact tablet or capsule from a unit dose package

1.19 Personal protective equipment (PPE): Gloves

Tips for Safe PPE:
1. Inspect gloves for physical defects before use.
2. Remove and discard gloves immediately after use, if torn, if punctured, if drug contact occurs, or after 30 minutes of wear.
3. Remove outer gloves first, turning them inside out to prevent the contaminated outer surfaces from touching the inner gloves.
4. Remove the inner gloves last after discarding all contaminated items and PPE.
5. Wash hands after removing gloves.
6. Do not reuse gloves.
1.20 Personal protective equipment (PPE): Chemo gown

PERSONAL PROTECTIVE EQUIPMENT (PPE): CHEMO GOWN

- Required when handling oral liquid, topical, subcutaneous, intramuscular, intravenous, and powders and solution for inhalation
- Disposable, single use gowns
  - Used gowns should not be hung up or reapplied after removal
  - This prevents transfer of drug contamination to the environment and the worker’s clothing
- The inner glove cuff is worn under the gown cuff; the outer glove cuff extends over the gown cuff to fully protect the skin.
- Discard the gown if it is knowingly contaminated, before leaving hazardous medications handling areas, and when finished with hazardous medications handling.

1.21 Personal Protective equipment (PPE)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Approved Respirator

- Wear a NIOSH-approved respirator when inhalation exposure is possible
- Example: preparing medications without a fume hood

Eye and Face Protection

- Wear a face shield or a combination of mask and face shield that provides splash protection whenever hazardous medications splashing is possible and when working above your head

(Photo courtesy of Georgia Cancer Specialists, Atlanta, GA)
1.22 Administering oral hazardous or cytotoxic agents

ADMINISTERING ORAL HAZARDOUS OR CYTOTOXIC AGENTS

- Due to the risk of inhalation exposure, oral pills should not be broken, crushed, or mixed with food or fluid outside of the Biologic Safety Cabinet.
- Even intact hazardous medication tablets or capsules may be coated with residual hazardous drug dust.
- If a oral pill has to be altered, it should ideally be done within biologic safety cabinet or fume hood and provided in an oral syringe for administration.
- When handling a liquid hazardous drug, gowns should also be worn in addition to gloves.

1.23 Proper disposal

PROPER DISPOSAL

Dispose used or empty hazardous/cytotoxic containers such as pill packaging into one of the following containers:

- Gowns, gloves, syringes, needles, and other disposable items may be placed in the “Cytotoxic Waste” container.
- Unused hazardous/cytotoxic medications may be placed in black Stericycle bin or returned to pharmacy per your site’s practice.

*Do not* place hazardous drug-contaminated sharps in red sharps containers that are used for infectious wastes, since these are often autoclaved or microwaved.

*Both of these bins must be kept tightly closed at all times!*

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1.24 Cytotoxic spill procedures

- Associates must know where the spill kit is located in their department
- Spills should be cleaned up immediately by a trained staff member using the Cytotoxic Spill Kit
  - NOTE: the kit has specific instructions for use
  - Spill Kits can be found in Pharmacy and all chemo carts

Notes:
1.25 An example of cytotoxic spill kit contents

AN EXAMPLE OF CYTOTOXIC SPILL KIT CONTENTS

- Absorbent pads
- Spill signs
- Chemicals used in clean up
- Eye protection
- Gloves
- Scrapers
- Gown
- Face mask
- Head protection
- Shoe covers
- Cytotoxic, bio hazardous bags

1.26 Spill Control

- Reference the Safety Data Sheet via Intranet
- Manage hazardous drug spills according to the established, written policies and procedures
- Be aware that the size of the spill determines who is authorized to conduct the cleanup and decontamination and how the cleanup is managed
- The written policies and procedures and spill kit address the protective equipment required for various spill sizes, the possible spreading of material, restricted access to hazardous drug spills, and signs to be posted
- Assure that cleanup of a large spill is handled by workers who are trained in handling hazardous materials
- Locate spill kits and other cleanup materials in the immediate area where exposures may occur
- Dispose of all spill cleanup materials in a hazardous chemical waste container, in accordance with EPA/RCRA regulations regarding hazardous waste—not in a chemotherapy waste or biohazard container
1.27 Patient education: managing hazardous medications in the home

**PATIENT EDUCATION: MANAGING HAZARDOUS MEDICATIONS IN THE HOME**

- Dispose of equipment and gloves that have come in contact with hazardous medications in the chemotherapy waste container (obtained from pharmacy supplying chemotherapy)
- Flush toilet twice with the lid closed for 48 hours after receiving chemotherapy
  - Wash hands with soap and water after
- Wash your clothing or linen normally unless they become soiled with chemotherapy. If this happens, put on disposable gloves and handle laundry carefully to avoid getting chemotherapy on the skin
- Spill Kit
  - In the event of a chemo spill, open the spill kit and put on two pairs of gloves, the mask, gown, and goggles
  - Absorb the spill with the disposable sponge
  - Clean the area with soap and water
  - Dispose of all the materials—including gloves, mask, gown, and goggles—in the chemo waste container

1.28 Occupational health

**OCCUPATIONAL HEALTH**

- Associates that administer intravenous cytotoxic (antineoplastic) medications are encouraged to complete a Periodic Health Assessment form annually
- All associates with potential exposure to cytotoxic medications through preparation, administration, housekeeping, waste disposal, transport, or storage will be offered specific lab tests annually, post acute exposure, and upon job termination or transfer
- Associates will be referred to a physician if further medical evaluation/treatment is indicated

Contact Colleague Health and Safety for further information

Notes:

Hover over Health Assessment to reveal: a complete blood count with differential, SGOT,
ALT (SGPT), creatinine, blood urea nitrogen, and urinalysis for blood

1.29 Exposure log

EXPOSURE LOG

- All personnel handling intravenous antineoplastic (cytotoxic) agents in the course of their job duties shall maintain an Exposure Log in their department.
- The number of each drug the individual has prepared or administered shall be recorded.
- The Exposure Registry/Log for each associate shall be routed to Colleague Health and Safety annually for entry into the associate's health record.

1.30 Summary

SUMMARY

In this module you learned:
- The definition and categories of hazardous medications
- The potential health risks to healthcare providers exposed to these medications
- How to identify a hazardous/cytotoxic medication in the work setting
- How to safely handle cytotoxic/hazardous medications through consistent use of personal protective equipment (PPE) and participation in medical surveillance
- Resources available for managing a cytotoxic/hazardous drug spill
1.31 Check your knowledge

What Personal Protective Equipment (PPE) is **required** when handling hazardous drugs in **pill form**?

- Respiratory Mask
- Gown
- Gloves tested & approved for use with agent given
- Eye protection

**Notes:**

Gloves: pop up a did you know all gloves used in patient care areas are chemo rated
Untitled Layer 1 (Slide Layer)

CHECK YOUR KNOWLEDGE

What Personal Protective Equipment (PPE) is **required** when handling hazardous drugs in **pill** form?

Correct!

Note: All hospital gloves are chemo rated.

Click here to continue.

Respiratory Mask

Eye protection

Untitled Layer 2 (Slide Layer)

CHECK YOUR KNOWLEDGE

What Personal Protective Equipment (PPE) is **required** when handling hazardous drugs in **pill** form?

Incorrect!

Click here to try again.

Respiratory Mask

Eye protection
1.32 Check your knowledge

Notes:

Double gloves, chemo gown, eye protection
REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE)

Correct!
A respiratory mask is NOT required.
Click here to continue.

Incorrect!
A gown is required when handling hazardous drugs in IV piggyback form.
Click here to continue.
CHECK YOUR KNOWLEDGE

What Personal Protective Equipment (PPE) is NOT required when handling hazardous drugs as an **intravenous piggyback**?

Incorrect!

Double gloves are required when handling hazardous drugs in IV piggyback form.

Click here to continue.
## 1.33 Check your knowledge

*(Pick One, 10 points, 1 attempt permitted)*

Which types of hazardous medications must be transported in a clearly labeled, protective container?

<table>
<thead>
<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Non-Oral Medications</td>
</tr>
</tbody>
</table>

**Notes:**

Double gloves, chemo gown, eye protection
Untitled Layer 1 (Slide Layer)

CHECK YOUR KNOWLEDGE
Which types of hazardous medications must be transported in a clearly labeled, protective container?

Correct!
Click here to continue.

Untitled Layer 2 (Slide Layer)

CHECK YOUR KNOWLEDGE
Which types of hazardous medications must be transported in a clearly labeled, protective container?

Incorrect!
Click here to try again.
1.34 REFERENCES

- Joint Commission, CAMH, 2011: chapter sections EC 02.02.01

1.35 Results Slide

*(Results Slide, 0 points, 1 attempt permitted)*

Thank you for completing!

*Click the button below to EXIT the module and receive credit for completing.*

[EXIT](#)
Results for

1.33 Check your knowledge

Result slide properties

Passing 80%

Score