Cytotoxic Drug MANUAL
Administration and Handling Guidelines

3rd Edition

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For questions about the information in this guide, please contact the Drug Information North (phone 780-407-7404 druginfolnorth@albertahealthservices.ca).
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PREFACE

The information contained in this manual is intended for use within Alberta Health Services (AHS) - Edmonton zone / Covenant Health (CH). No liability will be assumed for use of this manual outside of AHS - Edmonton zone / CH. The information enclosed herein on behalf of AHS - Edmonton zone / CH is copyrighted and contains privileged or confidential information. Any recipient is not authorized to make this manual public or reproduce in any manner without written permission from the Drug Information Centre -North (DIC-N), AHS - Edmonton Regional Pharmacy Services, Edmonton, Alberta, Canada.

We would like to acknowledge the numerous regional Nursing, Pharmacy, Medical, Workplace Health and Safety, and Materials Management staff members for their assistance in revising this manual.

Comments can be submitted to the DIC-N, Walter C. MacKenzie Centre, Room 2K3.29, University of Alberta Hospital, Edmonton, Alberta, Canada (phone 780-407-7404, e-mail: druginfonorth@albertahealthservices.ca )
1. General Guidelines

A. Introduction

These are guidelines for the safe handling and disposal of cytotoxic drugs used in our health care facilities and homecare setting. The benefits of these drugs outweigh the risk of adverse effects for patients who are prescribed these drugs but healthcare workers risk adverse effects with no therapeutic benefit. Acute side effects such as skin, eye or mucous irritations and chronic effects such as cancer and adverse reproductive events can result from exposure. Appropriate handling precautions during preparation, transportation, administration and disposal will minimize these hazards and are necessary to ensure a safe and healthy workplace for all staff.

- Whenever possible, preparation of cytotoxic drugs shall take place in Pharmacy. If impossible, please follow guidelines on
- Whenever possible, a suspension must be supplied or prepared by pharmacy for administration of any doses that require opening of capsules or crushing/splitting of tablets.

B. Routes of Exposure

The following activities may result in exposure via: inhalation, ingestion, injection and skin contact:

1. Preparing liquid formulations from powdered or lyophilized preparations.
2. Inserting or withdrawing needles from vials / ampoules.
3. Administering drug by any route.
5. Touching contaminated drug vial surfaces, work surfaces, floors, and final drug preparations.
6. Transferring drug via syringe needle or filter straw.
7. Opening ampoules.
8. Expelling air from a drug-filled syringe when measuring the precise volume of drug.
9. Spiking IV bags and changing IV tubing.
10. Clearing air from an infusion line/priming the IV set.
11. Securing of tubing, syringe or stopcock connections.
12. Disposing of used needles, syringes, IV tubing, catheters, vials/containers/packaging contaminated by these drugs
13. Handling of body fluids/excreta from patients receiving these drugs.
15. Handling of topical preparations.
16. Breaking or crushing oral tablets or opening oral capsules.
17. Performing certain specialized procedures (such as intra-operative intra-peritoneal chemotherapy in the operating room).

Other factors that affect exposure include:
1. Drug handling task performed (i.e. preparation, administration or disposal)
2. Amount of drug prepared/handled.
3. Frequency and duration of drug handling
4. Potential for absorption
5. Site of preparation (i.e. is a ventilated cabinet used or not?)
6. Type of personal protective equipment worn
7. Work practices/procedures.

C. Definitions

For the purposes of this manual, the terms “drug” and “medication” are considered interchangeable.

1. **Hazardous**:
   Following The National Institute of Occupational Safety and Health (NIOSH) definition, hazardous drugs are drugs that pose a potential health risk from exposures in the workplace. They exhibit one or more of the following effects in humans or animals:
   - **Carcinogenicity** – capable of causing or promoting the development of cancer or a lesion which could be the starting point of a cancer
- **Teratogenicity or other developmental toxicity** – capable of causing congenital malformations due to an action on the embryo
- **Genotoxicity** – capable of damaging genetic material (DNA) to cause mutations
- **Reproductive toxicity** – capable of affecting fertility (i.e., miscarriages, late fetal death, infertility)
- **Organ toxicity at low doses** – capable of causing serious organ or other toxic effects at a low dose (i.e., liver damage, local necrosis of exposed tissue)
- **Structure and toxicity profiles** of new drugs that mimic existing drugs determined hazardous by the above criteria.

Hazardous drugs are further classified into **cytotoxic hazardous** (non-antineoplastic and antineoplastic) and **non-cytotoxic hazardous** drugs (i.e., biologicals including some monoclonal antibodies, retinoids, hormonal agents, some antivirals, tyrosine kinase inhibitors, immunosuppressants, and others). See Appendix A for list of cytotoxic hazardous hereafter referred to as “cytotoxic” drugs.

This manual is for “CYTOTOXIC” drugs and Bacillus Calmette Guerin (BCG) only.

2. **Cytotoxic**:  
Cytotoxic will refer to hazardous drugs that have been determined to have **significant** risk from occupational exposure. This group includes drugs used in the active treatment of cancer/neoplasm (antineoplastic drugs) and some other drugs **NOT used** in the active treatment of cancer/neoplasm but require similar handling procedures and training as antineoplastic cytotoxic drugs.

3. **Non-cytotoxic hazardous drugs (referred to as “hazardous” drugs within AHS):**  
These are drugs that have **some** risk from occupational exposure that may require staff to take precautions during preparation, administration, and handling. Biologicals including some monoclonal antibodies, retinoids, hormonal drugs, immunosuppressants, antivirals, tyrosine kinase inhibitors, and others are considered “hazardous” drugs. It is the responsibility of the qualified staff to ensure that they are aware of these drugs and precautions required when handling / administering these drugs. Handling precautions for these medications will not be addressed in this manual.

4. **Extravasation**  
Is the leakage or inadvertent administration of a vesicant into surrounding tissue that is capable of causing tissue damage.

5. **Vesicant:**  
Is a drug that can cause tissue destruction or necrosis when extravasation occurs.

6. **Irritant:**  
Is a drug capable of producing pain, discomfort, inflammation, or local irritation at the administration site or along the vein pathway but usually without subsequent tissue damage.
7. **Infiltration:**
   Is inadvertent administration of a non-vesicant drug solution into surrounding tissue.

8. **Regulated Staff:**
   Refers to health care professionals employed by AHS-Edmonton Zone/ Covenant Health (CH) whose practices are regulated under the Health Professions Act.

9. **Qualified staff** are members of AHS-Edmonton Zone/CH who are permitted by legislation and policy to dispense or administer cytotoxic medications in accordance with their respective practice regulation under the Health Professions Act (or other legislation).

10. **Specialized Training:**
    Refers to qualified staff who have acquired knowledge, skill, attitudes and judgments through specialized education and practice relating to administration of drugs, as provided by a clinical nurse educator (or designate) in their clinical area and as demonstrated by hard / electronic copy of that certification.

    With respect to cytotoxic (antineoplastic and non-antineoplastic) drug administration, site/program specific policies/procedures should be consulted to determine what training or certification is required when administering these drugs. It is the responsibility of the qualified staff to ensure that they renew their certification or receive training as required by site / program policies / procedures and legislation.

11. **Cytotoxic Waste Container:**
    Refers to a rigid, puncture-resistant waste container displaying the “cytotoxic” symbol. With each cytotoxic waste container, an absorbent pad should be placed at the bottom of the inside of the container to absorb liquid cytotoxic waste.

12. **Biohazardous /Biomedical Waste Container:**
    Refers to a rigid, puncture-resistant waste container or cardboard box that is lined with a yellow plastic bag displaying the “biohazard waste symbol” or/and is labeled “biohazardous waste”.

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13. **Spill (Small):**
   Is a spill that has spread to no more that 23 centimetres in diameter, outside of a hood which can be contained with a cytotoxic spill kit.

14. **Spill (Large):**
   Is a spill that is greater than 23 centimetres or is any “running spill” where the source has not been contained or flow has not stopped and which cannot be contained with a cytotoxic spill kit.
2. Protection of Employees and Patients

- Each department/program is responsible for identifying employees and others (i.e. patients/visitors) at risk from handling cytotoxic drugs, informing them of the potential risk and protective measures, and ensuring that they are properly equipped and trained to handle these drugs.

- To date, there are no specific markers or recommended safe occupational exposure limits for these drugs that can be used to monitor health effects in routine examinations of workers. Therefore, preventing exposure to these drugs by handling these drugs in a safe manner is of utmost importance.

- All individuals involved in the transportation of these drugs shall be educated in spill management.

- Cytotoxic spill kits shall be available whenever possible in the areas where these drugs are stored, prepared, dispensed, received and administered. Alternatively, spill kits can be supplied when cytotoxic medications are dispensed or staff can be educated as to the location of the nearest spill kit or where to obtain a spill kit.

- Cytotoxic spill kits should be inspected regularly and replaced if items are missing, contents have expired or found to be unusable (i.e. integrity of gloves compromised).

- Staff shall not eat, drink, chew gum, apply makeup or store food in the areas where cytotoxic drugs are stored or handled.

- It is recommended that cytotoxic drugs be stored separately from other drugs.

- Store and transport cytotoxic drugs in such a way that minimizes the risk of breakage.

- Limit access to areas where cytotoxic drugs are prepared to protect persons not involved in the drug preparation.

- Check cytotoxic drugs before removing them from storage area to ensure that the packaging is intact and there is no breakage.
A. Accidental Exposures

1. Accidental employee exposures are to be reported to the immediate supervisor, Patient Care Manager or designate and to the appropriate workplace, health and safety (WHS) service. An employee incident/injury reporting and investigation form must be completed.

2. The most responsible physician or designate shall be notified when patients are involved in accidental exposures. The incident shall be reported, as per current incident reporting guidelines.

3. Employees handling these drugs are encouraged to arrange a routine medical examination on an annual basis.

B. Pregnancy and other Medical Conditions

1. Anyone can be at risk of adverse effects from occupational exposure to cytotoxic medications. It is important to limit exposure by following guidelines found in this manual. If you have a medical condition that you feel excludes you from handling these medications, consult with Occupational Health and notify your manager.

2. It is the responsibility of staff handling these drugs to discuss with their immediate supervisor any desired change in work assignment as a result of their pregnancy, breastfeeding, or attempt to reproduce.

C. Personal Protective Equipment (PPE)

1. PPE must be worn as indicated in Tables 1 and 2.

2. PPE must not be worn outside the preparation, dispensing, receiving or administration area to avoid spreading contamination and possibly exposing non-protected staff.

3. PPE must be worn when dismantling and disposing equipment used in the administration of these drugs

4. Disposable PPE should be used whenever possible.

5. Used disposable PPE must be handled as cytotoxic waste.

6. Donning (putting on) and doffing (removing) of PPE procedure can be found in Appendix B and C.
<table>
<thead>
<tr>
<th>Table 1: Personal Protective Equipment (PPE) Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GLOVES</strong></td>
</tr>
<tr>
<td>• Suitable gloves are powder-free, made of nitrile, latex, polyurethane or neoprene and comply with American Society of Testing and Materials (ASTM) standard D-6978-05 for chemotherapy gloves or have been tested for use with cytotoxic drugs.</td>
</tr>
<tr>
<td>• Latex gloves should be avoided if possible due to the risk of latex sensitivity (allergies).</td>
</tr>
<tr>
<td>• Sterile procedures require sterile gloves.</td>
</tr>
<tr>
<td>• Inspect gloves for defects prior to use.</td>
</tr>
<tr>
<td>• Gloves must be changed within 60 minutes or in accordance with manufacturer’s recommendations or in the event of contamination, spillage, breakage or puncture.</td>
</tr>
<tr>
<td>• Do not touch other equipment with gloves that you have handled cytotoxic drugs with. Remove outer glove and use inner glove to manipulate equipment if needed.</td>
</tr>
<tr>
<td>• Gloves must not be reused. Hands must be washed with soap and water after removal of gloves.</td>
</tr>
<tr>
<td><strong>GOWNS</strong></td>
</tr>
<tr>
<td>• Disposable, lint-free, moisture-resistant, made of low permeability fabric with a closed front, a back closure and long sleeves that can be enclosed with gloves such as sleeves with elastic or knit closed cuffs (hereafter referred to as the DMR gown) is required when handling cytotoxic drugs that may spill / splash/ emit or form liquid aerosolized droplets/solid particles.</td>
</tr>
<tr>
<td>• Gowns must be proven to protect against cytotoxic drugs.</td>
</tr>
<tr>
<td>• Gowns must be changed daily or whenever contamination is suspected. Gowns must be removed when leaving the treatment setting/unit. Gowns must not be shared.</td>
</tr>
<tr>
<td>• Yellow isolation gowns may be worn if there is no risk of spillage, splash or aerosolization of solid/liquid particles. (i.e. when handling of tablets or capsules) at the discretion of qualified staff.</td>
</tr>
<tr>
<td><strong>EYE PROTECTION</strong></td>
</tr>
<tr>
<td>• Eye/face protection consisting of face sealing chemical splash goggles with or without side vents or a full face shield must be worn when there is any hazard of eye contact (i.e. if risk of splashing or aerosolization of liquid/solid particles).</td>
</tr>
<tr>
<td>• Goggles are particularly appropriate for contact lens wearers (a potential additional hazard if contaminated).</td>
</tr>
<tr>
<td>• Eyeglasses do not provide sufficient eye protection.</td>
</tr>
<tr>
<td>• If goggles are not visibly or only minimally contaminated, they may be reused. Wash thoroughly with household detergent1 and water after use. Wear gloves and gown when washing goggles. If overtly contaminated, discard goggles into cytotoxic waste container.</td>
</tr>
<tr>
<td>• Adequate Workplace Safety and Health approved eyewash facilities must be provided.</td>
</tr>
<tr>
<td><strong>RESPIRATORY PROTECTION</strong></td>
</tr>
<tr>
<td>• Fit tested N-95 mask is required for protection whenever there is a possibility of aerosolized particles (solid or liquid).</td>
</tr>
<tr>
<td>• A surgical mask is not suitable as it does not provide adequate protection.</td>
</tr>
<tr>
<td><strong>HEAD AND SHOE PROTECTION</strong></td>
</tr>
<tr>
<td>• Appropriate head and shoe covers are recommended for spill cleanup and for the preparation and/or administration of any cytotoxic drugs that may splash or spill or aerosolize. Apparel may not be worn out of the area. Closed toe footwear recommended.</td>
</tr>
</tbody>
</table>

1The use of a household detergent and water is the most effective method for cleaning contaminated items (better than water alone). No one detergent is preferred over another as no detergent has been determined to be effective against all of these drugs or found to be superior.
### Table 2: WHEN and WHAT Equipment to Wear

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>GLOVES</th>
<th>GOWN</th>
<th>EYE PROTECTION</th>
<th>RESPIRATORY PROTECTION</th>
<th>HEAD AND SHOE PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>crushing or splitting tablets,</td>
<td>TWO pairs</td>
<td>Disposable moisture-</td>
<td>Goggles or Face Shield</td>
<td>N-95 mask</td>
<td></td>
</tr>
<tr>
<td>opening capsules and preparing</td>
<td>of gloves</td>
<td>resistant, long-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>oral liquid preparations or IV</td>
<td></td>
<td>sleeved gown (DMR-gown)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>admixtures¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>TWO pairs</td>
<td>DMR-gown</td>
<td>Goggles or Face Shield</td>
<td>N-95 mask</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of gloves</td>
<td>If potential for splash,</td>
<td>If potential for splash,</td>
<td>If potential for splash,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>spill or aerosolization</td>
<td>spill or aerosolization</td>
<td>spill or aerosolization</td>
<td></td>
</tr>
<tr>
<td><strong>Spill Clean-Up</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>TWO pairs</td>
<td>DMR-gown</td>
<td>Goggles or Face Shield</td>
<td>N-95 mask</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of gloves</td>
<td>If potential for splash,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>spill or aerosolization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Waste Disposal</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(includes PPE, supplies, IV</td>
<td>TWO pairs</td>
<td>DMR-gown</td>
<td>Goggles or Face Shield</td>
<td>N-95 mask</td>
<td></td>
</tr>
<tr>
<td>bags &amp; lines, drug &amp; cytotoxic</td>
<td>of gloves.</td>
<td>If waste is not contained</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>human waste)</td>
<td></td>
<td>and/or there is a risk of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>spread or spill.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ should be completed in pharmacy whenever possible, but if necessary to do outside of pharmacy, follow chart.
3. Receiving /Transport of Unprocessed Cytotoxic Drugs

A cytotoxic spill kit should be available in receiving areas whenever possible. Alternatively, staff can be educated as to the location of the nearest spill kit or where to obtain a spill kit.

Cytotoxic drugs from suppliers may arrive at the receiving /loading dock or may be delivered directly to the pharmacy. Regular receiving procedures will be used at the loading dock. The package should remain intact and only quantity needs to be checked. The unpacking and storage will be completed in the pharmacy.

If a cytotoxic package is leaking, clear the area, and initiate cytotoxic spill cleanup procedures.

A small spill is a spill which can be contained using a cytotoxic spill kit and a large spill is a spill which cannot be contained with a cytotoxic spill kit. (See definitions section 1. C). For spills in public areas and/or those that cannot be managed with a cytotoxic spill kit by existing staff at site of spill, Environmental Services or a CODE BROWN can be called as per site policies/procedures.

To minimize exposure, a damaged package should never be returned to the manufacturer or distributor. The manufacturer or distributor must however, be notified.
4. Ordering Procedure for Cytotoxic Antineoplastic Drugs

1. Wherever possible, the course and protocol being followed or modified should be indicated on the Patient Care Orders.

2. Generic drug names must be used. Abbreviations are prohibited.

3. Patient Care Orders must indicate the following:
   a) The route of administration
   b) The volume of intravenous fluid required, if applicable. If an exact volume of fluid is required, this should be indicated (e.g., 50 mg drug added to D5W to make a final volume of 50 mL)
   c) Patient’s height and weight (in metric measurements). Height and weight should be confirmed.
   d) Where the dosage of the drug is based on the body surface area (BSA), the dose/meter squared must be indicated, along with the patient’s height, weight and BSA determination.
   e) Where dosage is based on weight, the dose/kg must be indicated, along with the patient’s weight
   f) The date and administration time

4. Antineoplastic chemotherapy orders must be signed by:
   a) In adults, the attending hematologist, attending ward associate, or senior hematology fellow approved by hematology divisional director or attending physician or designated authorized physician as permitted by policy or legislation when there is no attending hematologist.
   b) In pediatrics, the pediatric oncologist or designated authorized physician as determined by the attending oncologist and permitted by policy or legislation.
   c) The Physician, Resident, or Oncology/Hematology Nurse Practitioner who must identify the individual as in a) and b) above who has verbally approved and will co-sign the order.
   d) The Interventional Radiologist performing the intra-arterial chemotherapy procedure.

- All changes to cytotoxic antineoplastic medications must be written by authorized personnel as permitted by policy or legislation.
- When an oncology drug protocol is in use, the pharmacist will verify the antineoplastic drug orders with the protocol.
5. Ordering Procedure for Cytotoxic Non-antineoplastic Drugs

Orders for cytotoxic drugs used for non-antineoplastic indications shall be on a Patient Care order form and written as per AHS – Edmonton Zone Medication Orders CAD 2.3.4 / CH Medication Orders Policy VII-B-125.
6. Labeling

A. General Information

1. All cytotoxic oral solutions, suspensions and topical preparations and all parenteral cytotoxic drugs (syringes, IV bottles and bags) will be clearly and visibly marked with the cytotoxic hazard symbol (Figure 1).

![Cytotoxic Hazard Symbol](image1)

2. All cytotoxic oral tablets and capsules will be clearly labeled as “Cytotoxic”. Appropriate auxiliary labels will be affixed by pharmacy as required. See Figure 2 and Figure 3.

![Cytotoxic auxiliary labels](image2)

![Auxiliary labels](image3)

3. For patient specific cytotoxic drug dispensed from pharmacy, the following information must be included on the pharmacy label:
   - Patient’s name, hospital ID number, and room number/outpatient area
   - Generic drug name
   - Dose. For syringes, indicate dose in number of mL (e.g., 100 mg = 2 mL)
   - Strength of drug. Use concentration for syringes (e.g., 50 mg/mL)
   - Infusion solution (if applicable)
   - Total volume for parenteral solutions
   - Route of administration (i.e. oral, topical, IV, subcutaneous, IM)
   - Date prepared or dispensed
   - Expiry date for any compounded preparations
   - Special storage conditions (if applicable)
B. Intrathecal Medications

1. To reduce the possibility of errors in the delivery and administration of INTRATHECAL cytotoxic medications, pharmacy will affix FLUORESCENT PINK “Intrathecal Medication” warning labels directly on all syringes and to the exterior packaging (see Figure 3 below).

The warning label will be affixed midway on the barrel of the syringe, ensuring that the physician has enough finger room to manipulate the syringe and ensuring that the dose markers on the syringe are not covered.

An identification label with drug name, strength, diluent and dose will be affixed to the syringe in such manner that the dose markers on the syringe are not covered and the label can be read prior to opening the package and removing the syringe.

2. In the patient care areas, intrathecal cytotoxic medications must be stored in a designated intrathecal box, which is kept separate from other drugs.

![Figure 4: Label for Intrathecal Medications](image)

C. Vinca Alkaloids (Vincristine/Vinblastine/Vindesine/Vinorelbine)

1. To prevent errors involving inadvertent intrathecal administration of VINCA ALKALOIDS, pharmacy will affix FLUORESCENT GREEN warning labels on all vinca alkaloid products (syringes or infusion bags) and to the exterior packaging. The warning label affixed to a syringe will be done in such a manner that the dose markings are not covered. The label will state: “For INTRAVENOUS USE only – FATAL if given by other routes.

2. In the patient care areas, vinca alkaloids must be kept separate from intrathecal drugs during delivery and storage on the patient care unit.
7. Transportation within the Health Care Facility

A. Deliveries (from the Pharmacy to the Patient Care Area)

1. Precautions shall be followed to prevent breakage, minimize exposure, and contain spills when transporting cytotoxic drugs.

2. **Cytotoxic medications** must be HAND DELIVERED to minimize the possibility of medication falling or breakage during delivery. Mechanical transportation devices such as the pneumatic tube system and the telelift system MUST NOT be used due to the stress these devices place on their contents and risk of breakage.

3. Cytotoxic medications shall be placed into **two** sealable plastic bags or one sealable bag placed into a rigid container and labeled with a warning label identifying the contents as cytotoxic. See below for examples:

4. Luer lock syringes should be used to contain **injectable** cytotoxic medications and these syringes should be transported with the luer lock end capped. Do not transport syringes with needles attached. A luer-lock syringe should **NOT** be used for oral preparations to avoid accidental parenteral administration. Cytotoxic medications will be packaged from pharmacy in **safety engineered devices (SED)** whenever possible and appropriate.

5. All **pharmacy compounded IV, oral or topical** formulations of cytotoxic medications must be handled with a single pair of disposable gloves during transportation and delivery as well as receiving and retrieving from storage on the patient care units.

6. Upon delivery/arrival, the cytotoxic medication should be checked to ensure it is delivered **intact** to the correct area, and is **stored appropriately** under refrigeration or at room temperature segregated from food and other drugs.

7. All individuals involved in the transportation shall be educated in spill management.
8. Intrathecal preparations must be placed in a designated intrathecal box, which is kept separate from other drugs.

9. **Vinca alkaloids** must be **kept separate** from intrathecal medications during delivery and storage on the patient care unit

**B. Returns**

1. **Unused/unopened** cytotoxic medications

   Unused/unopened cytotoxic medications may be returned to the pharmacy enclosed in two sealable plastic bags or one sealable bag placed into a rigid container and labeled with a warning label identifying the contents as cytotoxic. They must be HAND DELIVERED. The pharmacy **must** be notified when an unused/unopened cytotoxic medication is being returned.

2. **Used / partially used / opened** cytotoxic medications

   Used / partially used / opened cytotoxic medications shall **not** be returned to pharmacy and must be disposed of as cytotoxic waste in a cytotoxic waste container on unit.
8. Administration Guidelines

A. Routes of Administration and Who May Give: Non-Antineoplastic and Antineoplastic Cytotoxic Drugs

The administration of any of these drugs by any route must be performed by qualified staff. It is the responsibility of the qualified staff to be aware of their qualifications / limitations based on their scope of practice, training, legislation and site/unit policies. The parenteral manual can be consulted to determine who and what qualifications are required for administration of parenteral and intravesical cytotoxic drugs.

B. General Administration Guidelines – All Routes

1. Qualified staff shall follow the AHS – Edmonton Zone Corporate Administrative Directive 2.3.5 / CH Medication Administration Policy on Drug Administration when administering cytotoxic drugs.

2. All drugs must be checked against the written order prior to administration for verification of drug, dose and schedule.

3. The expiry date/stability of the drug must be checked prior to administration to ensure medication has not expired.

4. The calculated body surface area (BSA) must be verify and be congruent with body shape of patient.

5. Ensure the SEVEN rights of drug administration are followed: Right drug, Right dose, Right time, Right route, Right patient, Right reason and Right documentation. In addition, other safety checks that may apply include ensuring the Right rate, Right protocol, Right site and Right frequency.

6. TWO qualified staff must independently co-check/co-sign all administration records for all antineoplastic cytotoxic drugs by all routes. Please refer to the AHS – Edmonton Zone Corporate Administrative Directive 2.3.5 / CH Medication Administration Policy for the Procedure on Medication Administration Independent Double Checks.

7. Explain procedure to patient, along with the side effects of drug administration. Ensure the information is understood.

8. Gather supplies.

9. Ensure a cytotoxic waste container is available where cytotoxic medications are prepared/poured/manipulated or administered and the patient-care unit has a cytotoxic spill kit on hand or is aware of the location of the nearest spill kit. A cytotoxic waste container may be kept in the patient’s room but away from the bedside or in another predetermined location.
designated area. Cytotoxic containers shall be safely closed or fastened while in patient’s room. When the cytotoxic container is full or no longer required, the container should be stored with the lid securely sealed in a designated area (usually the dirty utility room) until picked up by environmental services for incineration.

10. Store cytotoxic medications in designated/segregated areas in bins that have high fronts and on shelves that have guards. Store at or below eye level.

11. Personnel shall wash their hands with soap and water thoroughly before putting on and after removing gloves when preparing, administering, or disposing of cytotoxic drugs or contaminated materials. Alcohol based hand sanitizer may be used before putting on gloves to eliminate bacterial contamination but as these products do not eliminate chemical contamination, they must not be used after removing gloves. Hands must be washed with soap and water after removing gloves.

11. Refer to Personal Protective Equipment (Table 2), to determine when PPEs are required.

12. Dispose of needles and syringes intact. Do NOT break or recap needles after use. Immediately discard into a rigid puncture proof cytotoxic waste container.

13. Whenever possible, use safety engineered or closed devices (SEDs) for the preparation and administration of cytotoxic drugs.

14. Use household detergent and water to wash surfaces that come into contact with cytotoxic drugs. PPE must be worn.
C. Intravenous (IV) Administration

Also refer to General Administration Guidelines. For personal protective equipment and when to wear it, see table 1 and 2.

Review your parenteral drug manual for specific drug information prior to administration.

An extravasation kit shall be available on the patient care unit prior to administration of a vesicant drug.

Patient Monitoring: Frequency is determined by the patient’s condition/age, prescribed therapy, and Vascular Access Device (VAD) used. It includes, but is not limited to assessment of the VAD insertion site and surrounding area, infusion flow rate, patient’s response/compliance, and side effects. Patency must be assessed prior to the administration of cytotoxic drug via blood withdrawal from VAD.

1. Direct IV Administration General Procedure
   a. Appropriate dilutions of the drug should be administered into an IV catheter with a compatible primary IV solution infusing concurrently over a minimum of two to four minutes, or as recommended in the AHS-Edmonton Zone / Covenant Health Services Regional Parenteral Manual (or site based parenteral manual if regional monograph not available). The patient must be observed for changes in vital signs or other untoward reactions.

   b. The IV tubing must be flushed after each drug with at least 25 mL of compatible solution such as NS or D5W. Post-administration, monitor the IV site at least once per hour until satisfied that drug has cleared the administration site to ensure that tissue damage has not occurred.

      EXCEPTION: outpatients may be instructed on what to report and then sent home

      EXCEPTION: For Pediatrics refer to direct IV administration guidelines as per site/program policy

2. IV Infusion Administration General Procedure (Continuous or Intermittent, Peripheral or Central Vein)
   a. Prime IV administration set (primary and secondary) with compatible isotonic solution (e.g., NS or D5W) that does not contain cytotoxic drug. The secondary IV administration set must be primed with the solution from the primary bag to ensure a closed system and decrease the risk of a spill.

      Calculate administration times/rates based on amount of flush used and desired rate.
b. It is recommended that cytotoxic drugs be infused via a secondary IV administration set using a needle-lock device attached to the primary IV administration set. IV administration sets must be secured and leak-proof. Use luer locks or safety engineered devices (SED) as required.

c. Ensure patency of the IV catheter prior to attaching cytotoxic drug. Patency of catheter must be checked each time that the catheter is accessed. Contact physician if patency is questionable. To determine patency, the following three must occur:
   i. Exit site is without signs of inflammation and infiltration such as redness, pain or swelling. Consider patient’s statements about comfort around site.
   ii. Blood return is brisk and consistent. If unable to aspirate blood from central line, obtain chest X-ray to confirm correct line placement (for vesicant drugs – dye studies are required).
   iii. IV fluid must run freely by gravity.

d. Attach the cytotoxic drug and begin infusion according to rate ordered.

e. The IV line must be dedicated to the cytotoxic drug only during administration.

f. Monitor the patient and the patient’s IV site at least hourly (q1h) or according to the cytotoxic drug protocol for any signs/symptoms of adverse reactions, extravasation, or phlebitis.
   i. If an adverse reaction is noted, stop the infusion, initiate emergency measures (e.g., Airway, Breathing, and Circulation) and notify the physician.
   ii. If extravasation is suspected with drug therapy, follow extravasation procedures (see section 10).
   iii. If phlebitis is suspected, discontinue infusion.

g. After drug administration, flush the IV administration set with 25 to 35 mL of compatible priming solution to ensure that the patient has received the full dose.

h. For consecutive administration of different cytotoxic drugs, remove the entire secondary drug administration set, prime a new secondary administration set from the primary infusion bag and, follow general administration procedure as outlined above.

i. All tubing /lines, including buretrols or similar devices must be changed for consecutive administration of drugs that are incompatible as there may be residual drug in the primary line.

j. Tubing/lines must be discarded into a cytotoxic waste container immediately upon completion of each dose or refer to site/program specific guidelines.

k. All IV administration sets used to deliver these drugs must be disposed of as cytotoxic waste, even if it has been flushed prior to disconnection.
I. When treatment is complete, a peripheral IV site may be left in place if needed. If no longer needed, remove the peripheral IV catheter and apply pressure for at least 5 minutes. Apply dressing as needed.

m. Discard all contaminated waste (e.g., bags, bottles, syringes, administration sets, gloves, disposable gowns, incontinence pads, disposable diapers, gauze dressings) as per the Cytotoxic Waste Handling – section 12.

n. Never remove tubing from an IV bag containing these drugs. Discard infusions bags with tubing attached. Do not disconnect tubing at other points in the system until the tubing has been thoroughly flushed.

3. **Additional Requirements for PERIPHERAL IV Infusions**
   a. It is recommended that when possible only non-vesicant drugs be given via this route. An infusion pump must be used.
   b. When selecting an IV catheter for peripheral insertion, the **smallest gauge and shortest length** is desired.
   c. It is not recommended to use pre-existing IV site for irritant /vesicant drugs.
   d. There is a potential for drug leakage from an antecubital puncture into surrounding tissue if blood specimen has been drawn within the previous 24 hours, therefore, when possible insert IV catheters into the opposite forearm.
   e. Always secure and tape IV catheter with transparent semi-permeable membrane (TSM) so insertion site is visible.
   f. If IV needs to be restarted, consideration must be given to using the alternate limb, if possible.
   g. The infusion should be monitored hourly, at a minimum, or according to drug protocol.
   h. Patient must be instructed not to handle heavy items with the limb that has IV due to the potential for blood/drug leakage into the subcutaneous tissue.

4. **Additional Requirements for CENTRAL VENOUS CATHETER (CVC) Infusions**
   a. Patency of the central venous catheter must be ensured prior to administration of cytotoxic drugs by this route. Refer to site-specific policies regarding use of central venous catheters.
   b. Infusion pumps must be used with all CVC cytotoxic drug infusions.
5. **Additional Requirements for IV administration (Peripheral or Central) of Vesicants**

a. In order to minimize local damage should extravasation occur, IV sites for vesicant drugs should be placed in the non-dominant arm with substantial soft tissue, avoiding the hand, feet, scalp veins, antecubital fossa areas or any other sites over joints and bony prominences if possible. In pediatrics avoid sites distal to any recent/previous (within 72 hours) venipuncture site. A new site is recommended with each dose if site is older than 24 hours. Note: site selection is at the discretion of the professional inserting the IV catheter.

b. In situations where a vesicant is infused peripherally, (e.g. single dose vesicants), extra IV site monitoring must occur.

c. In adults, blood return should be checked every 2-5mL for direct IV administration, every 5-10 minutes for infusions less than 100mL and every 30 minutes for infusions greater than 100mL.

d. In pediatrics, blood return should be assessed every 2-3 mL for direct IV administration in both peripheral and central venous access. For continuous infusions defined as those greater than 24 hours, check blood return every 4 hours and observe the CVAD site every 10ml or every hour for signs of inflammation / extravasation. Note: Continuous infusions of vesicants by the peripheral route are not recommended.

e. Re-establish patency immediately before infusion of vesicant or irritant and access new site if patency not certain.

f. For vesicant infusions, administer via gravity or infuse with an infusion pump with a pump pressure NOT greater than 50 mmHg.

g. Patients should be educated about the symptoms suggestive of extravasation /hypersensitivity and be instructed to report these immediately should they occur.

h. Patients should not leave the nursing unit during vesicant infusion and ambulation during administration is discouraged.
D. Intramuscular and Subcutaneous Administration

Also refer to General Administration Guidelines.
For personal protective equipment and when to wear it,
see Tables 1 and 2.

1. If an air bubble is found in a syringe prepared by pharmacy or commercially prepared, do not expel.

2. If an air bubble is present in a syringe prepared on the patient care unit, with needle cap on, expel bubble while holding a sterile gauze pad at the base of the needle to absorb any leakage. Staff must be wearing double gloves during this task.
   - The gauze pad and gloves must be disposed of immediately into a cytotoxic waste container.
   - Don on clean gloves and proceed with administration of medication.

3. Dispose of all cytotoxic waste (used syringes/needle, gloves etc.) into cytotoxic waste container.
E. Intrathecal Administration

Also refer to General Administration Guidelines.
For personal protective equipment and when to wear it,
see Tables 1 and 2.

1. Two qualified personnel must verify the Rights of drug administration immediately prior to intrathecal injection of all cytotoxic drugs.

2. Bring only the intrathecal cytotoxic drug into the room just prior to the time a lumbar puncture is performed.

3. A disposable, absorbent, plastic-backed pad should be placed under the injection site to absorb any leakage.

4. A lumbar puncture is performed using standard aseptic technique. Free flow of the cerebrospinal fluid is assured before injection of any cytotoxic drug.

5. The cytotoxic drug must be preservative free prepared in normal saline without preservative.

6. As a general rule, a volume of cerebrospinal fluid (CSF) equal to that of the injection volume is withdrawn prior to the injection.
F. Intravitreous/Intraocular Administration

Also refer to General Administration Guidelines.
For personal protective equipment and when to wear it,
see tables in section 2 (Protection of Employees and Patients).

- Refer to Ophthalmology program procedures.
G. Oral Formulation Administration

Also refer to General Administration Guidelines.
For personal protective equipment and when to wear it, see tables 1 and 2

1. Administering oral cytotoxic dosage forms present minimal risk unless the capsules are opened or the tablets are crushed or split. Capsule opening and tablet crushing/splitting on patient care units is generally not permitted due to the risk of aerosolized particles.

1.1 Pharmacy must be contacted to prepare a suspension formulation or to split tablets in a biologic safety cabinet whenever possible. Pharmacy shall provide suspensions/solutions of these drugs in an oral syringe, in a ready to administer form whenever possible. A luer-lock syringe must NOT be used for oral preparations to avoid accidental parenteral administration.

1.2 In the event that Pharmacy Services are unavailable or unable to provide this service and tablets must be crushed/split or capsules opened or liquids prepared on the patient care unit, measures as listed below must be taken to protect staff.

   1.2.1 Preparation should occur in an area away from drafts and traffic.
   1.2.2 Double gloves, DMR gown and N-95 mask must be worn.
   1.2.3 The work surface should be covered with a disposable plastic back pad.
   1.2.4 Tablets may be dissolved in water in a medication cup for immediate use. If a tablet requires crushing or splitting, place tablet and designated pill crusher/splitter, into a sealable plastic bag (i.e. Zip lock bag) and crush/split.
   1.2.5 Capsule contents may be placed in water in a medication cup for immediate use. Open capsules slowly into a small amount of water to minimize aerosolization.
   1.2.6 To crush cytotoxic drugs in unit-dose packaging, place the intact unit dose package and designated pill crusher in a small sealable plastic bag, and crush in sealed plastic bag without breaking the packaging.
   1.2.7 Clean contaminated equipment/surfaces with water saturated gauze first and clean again with household detergent and water and rinse.
   1.2.8 Discard contaminated materials in a cytotoxic waste container.

2. Double gloves must be worn when administering oral cytotoxic medications.

3. Discard used drug cups into a cytotoxic waste container.

4. If any powder has fallen on any surface (e.g., floor, counter), wash that area immediately with disposable paper towels, household detergent and water. Appropriate PPE must be worn (See Table 2)

5. Place paper towels, gloves and waste in a cytotoxic waste container.

6. If the spill is significant, use a cytotoxic spill kit (see section 13– Spills and/or Personnel Contamination).

7. When administering these drugs via enteral feeding tubes (i.e. PEG or NG tubes), follow required practices for each tubing system to minimize risk of spill or contamination via
leakage. Full personal protective equipment should be worn if there is a risk of aerosolization, leakage, splash or spill.

If solution requires transfer to a syringe (i.e. 60 cc catheter tip) for administration, any manipulation should occur at the patient’s bedside using appropriate spill precautions and a plastic back absorbent pad. PPEs should be worn.

A plastic back absorbent pad should be placed by site of administration to contain any leakage or spills.

Dispose of all cytotoxic waste generated in the manipulation and administration of the drug in a cytotoxic waste container immediately.
H. Topical Administration

Also refer to General Administration Guidelines. For personal protective equipment and when to wear it, see tables in section 2 (Protection of Employees and Patients).

1. **Sterile** double gloves suitable for handling cytotoxic drugs must be worn if the drug is being applied to an open skin lesion.

2. The drug shall be applied directly to the patient. A disposable plastic back lined pad shall be used to prevent contamination of the patient’s environment.

3. If the patient’s linens or gown become contaminated, they must be contained and secured. (See Cytotoxic Waste Handling – section 12).

4. All items used in dermal applications must be disposable. Dispose of these items into the cytotoxic waste container immediately after use.

5. The application process shall be carried out in a private area/treatment room away from other patients and in an area where all items can be disposed of immediately.

6. All multi-dose cytotoxic dermal solution/ointment/cream containers must be placed in double zip-lock bags labeled “cytotoxic” for storage. To avoid contamination of container, remove outer glove prior to placing container back in zip-lock bags.

7. **Cytotoxic Dermal Solution Administration – Additional Guidelines**
   a. Soak a sterile gauze pad with the solution and apply directly to the skin surface using forceps.

8. **Cytotoxic Dermal Ointments/Creams – Additional Guidelines**
   a. Remove the ointment/cream from the container using a sterile Q-Tip or tongue blade and apply directly to the skin. Use a new tongue blade or Q-Tip for each application.

   b. Spread the ointment/cream over the designated surface. Double gloves, suitable for handling cytotoxic drugs, must be worn (see section 2 C Personal Protective Equipment).

   c. To prevent contamination of the environment, patient movement must be restricted after applications of dermal cytotoxics until the ointment or cream is fully absorbed.
I. Bladder Instillations

Also refer to General Administration Guidelines.
For personal protective equipment and when to wear it, see Tables 1 and 2

1. Concentrated Mycobacterium Products (BCG or Bacillus Calmette-Guerin) Bladder Instillation

   a. BCG Reconstitution with a BCG Reconstitution Device:

   i. Nursing or pharmacy personnel may prepare BCG instillation solution. The BCG Reconstitution Device provides a closed system for reconstituting BCG. This device is designed for use with either ONCO TICE® (Faulding) or PACIS® (Pharmascience). Please refer to “Figure 5 - BCG Reconstitution Flowchart” on the next page.

   ii. Reconstitute BCG immediately prior to use. Suspension is stable for 2 hours only.

   iii. Don protective apparel consisting of double gloves, goggles, mask, gown, head and shoes covers.

   iv. Work on a non-porous counter top that is located in a low activity area and at a height that is comfortable.

   v. Prepare a syringe containing 50 mL NS at room temperature (Figure 5 - Step 1)

   vi. Ensure that the stopcock on the BCG reconstitution kit is turned to the “off” position to the catheter (Figure 5 – Step 2.1)

   vii. Attach the syringe containing 50 mL NS to the Luer lock end of the BCG Reconstitution Kit (Figure 5 - Step 2.2)

   viii. Remove the flip-top cap from the BCG vial and swab the top of the BCG vial with sterile alcohol swab.

   ix. Remove the spike cover of the BCG reconstitution kit and attach the BCG vial to the vial attachment end of the BCG reconstitution kit (Figure 5 - Step 2.3). The vial should be securely fastened. Note: ONCO TICE® and PACIS® brand BCG vials contain slight negative pressure. Therefore, a small amount of NS will be drawn into the vial from the NS syringe.

   x. Inject approximately 1 mL of NS (Figure 5 - Step 3.1) unless the negative pressure in the vial draws enough solution into the vial.

   xi. Gently swirl the vial until a homogenous suspension is obtained. Avoid forceful agitation (Figure 5 - Step 3.2). BCG dissolves in approximately 1 minute (ONCO TICE®) and 3 minutes (PACIS®).

   xii. Withdraw the contents of the vial back into the NS syringe (Figure 5 - Step 4.1) and rinse the vial as needed with approximately 1 mL each time to evenly distribute the suspension. Note: This is a closed system with a slight negative
pressure therefore there will be pressure differential between the vial and the syringe.

xiii. Leave stopcock in current position (off to the catheter) until ready to commence instillation. This will ensure the suspension will not leak out of the connecting tip. If stored prior to administration it should be kept in a zip-lock bag.

xiv. The device and gloves used in the preparation of the instillation solution are treated as bio-hazardous materials and should be discarded appropriately into a cytotoxic or biohazard waste disposal container after preparation. Put on new gloves for administration.

xv. Pharmacy prepared BCG product will be placed into an UV plastic bag (e.g., protected from light) enclosed in a zip lock bag and labeled with a cytotoxic sticker.

xvi. Pharmacy prepared BCG product will be hand delivered via a tray or cart. Mechanical transportation devices such as pneumatic tube/telelift must not be used.
Figure 5. BCG Reconstitution Diagrams
b. **BCG administration to Patient**

i. **Equipment:**
   - Urinary Catheter of appropriate size (usually #12 straight or Foley for female patients; #12 Coude tip for male patients)
   - Catheter insertion tray
   - Cytotoxic Spill kit (on unit)
   - Blue pads (disposable, plastic-backed liners) X 2
   - Sterile gloves, disposable gown, mask, and protective eyewear - refer to Table 1: Personal Protective Equipment (see section 2 – Protection of Employees and Patients).
   - Cytotoxic disposal container
   - BCG reconstitution device – See Figure 6 below.

![Figure 6. BCG Reconstitution Device](image)

ii. Patient to void prior to procedure.

iii. Gather equipment and bring to bedside.

iv. Explain procedure to patient and ensure patient understands.

v. Double check drug as per chemotherapy administration protocol. Ensure drug is at room temperature.

vi. Place disposable plastic-backed liner under patient to protect stretcher/bed from contamination.

vii. Prepare urethral catheter insertion tray.

viii. Put on gown, mask, and sterile gloves, and protective eyewear - refer to Table 1: Personal Protective Equipment (see section 2 – Protection of Employees and Patients).

ix. Catheterize patient and drain all residual urine in bladder. Use sufficient lubrication to prevent irritation to the urethra. (Catheterize with care to minimize urethral trauma. Anything that destroys the integrity of the bladder mucosal barrier, such as inflammation, instrumentation, electrocoagulation or infection will increase drug absorption and may lead to toxicity.)

x. Clamp catheter and set end on an absorbent pad.
xi. Immediately prior to use, while wearing protective apparel, hold the administration device vertical with the vial up and the syringe down, then pull all the suspension into the syringe (Figure 1 - Step 4.2) and turn the stopcock OFF to the vial (Figure 1 - Step 5.1).

xii. The syringe is now open to the catheter connection constituting AN OPEN SYSTEM.

xiii. Remove the catheter connector cover (Figure 1 - Step 5.2), and connect the device securely to the catheter previously inserted into the bladder. Insert the connector far enough into the catheter that the catheter covers the entire connector. Hold 2×2 gauze pad over the connection.

xiv. Instill the drug at a slow, steady pace to prevent bladder spasm. Leave syringe attached and set on absorbent pad. Clamp catheter. Remove catheter. Collect all supplies (including catheter) and dispose of in cytotoxic disposal container.

c. Patient Instructions Post-BCG Instillation

i. Instruct patient to try to retain BCG solution in his/her bladder for two hours or as long as possible.

ii. To maximize surface contact, have the patient alternate positions e.g., lie on left and right side, back and front for 15-20 minutes on each side. This allows for the BCG to coat the urothelium evenly and to be directly absorbed by the cancer cells, which then arrests cellular division.

iii. Instruct patient about possible reactions (note: not all patients will experience all side effects) to the BCG vaccine solution (rash, dysuria, and an unwell feeling). Instruct patient to notify doctor if they experience fever, chills, blood in urine, increased frequency of urination, painful urination, nausea and vomiting, cough or skin rash.

iv. See “BCG Waste Handling” below for patient voiding instructions.

v. Drink lots of fluids for at least six hours after the first void.

vi. Empty bladder frequently after the first void.

d. BCG Waste Handling

i. All disposable equipment and materials used for the preparation must be handled as biohazardous waste, and disposed of in the cytotoxic or biohazard waste disposal containers.

ii. Instruct patient to void in the sitting position to avoid splashing.

iii. Patients leaving the hospital BEFORE the first void following BCG bladder instillation should be instructed to utilize their own bathroom.
iv. After voiding, pour two cups of household bleach in the toilet, and let it sit for 15 minutes (i.e. do not flush for 15 minutes).

v. Double flush the toilet. Other chemical cleaning-agents should not be present to avoid chemical deactivation of the bleach.

vi. Sit down to void for the next 8 hours after the BCG treatment. Treat urine with bleach as described above.

vii. After each void, hands and genitals should be washed well with soap and warm water.

viii. Articles that have been touched by patients’ urine must be washed in hot water with detergent and bleach.

e. **BCG Spill/Accidental Exposure**

i. If a spill occurs, follow the Spills Procedure (see Spills and/or Personnel Contamination – section 13).

ii. Inadvertent injection, contact with an open wound, ingestion, or unprotected skin contact can cause a local or possibly systemic reaction.

iii. For skin puncture or needle stick injuries, follow the Accidental Exposure -Skin contact procedure (see Spills and/or Personnel Contamination – section 13). In addition, wipe the area of injury with 70% isopropyl alcohol.

iv. For inadvertent eye contact:
   - Follow the Accidental Exposure – Eye Contact Procedure (see Spills and/or Personnel Contamination – section 13)
   - Any accidental contact with BCG is to be reported to the immediate supervisor and to Workplace Health and Safety (WHS).
2. Bladder Instillations (Including Epirubicin, Mitomycin, and Thiotepa)

Use BCG administration procedure, except with the following differences:

a. Attach syringe to catheter; instill cytotoxic solution at a slow, steady rate into patient’s bladder.

b. Instruct patient about possible reactions to the bladder solutions (rash, dysuria, and feeling unwell). Instruct patient to notify doctor if they experience fever, chills, blood in urine, high frequency of urination, painful urination, nausea and vomiting, cough or skin rash.

c. After the cytotoxic drug administration, the patient must stay in the department for 2 hours or as ordered, and the patient’s first void must be transferred into a cytotoxic container. Cytotoxic handling precautions should be followed for 48 hours after dose.

d. All items (clothes, bedding and toilet articles) which have been contaminated with the patient’s urine must be washed separately in hot, soapy water.
9. Documentation

A. Antineoplastic cytotoxic medications given by any route must be co-checked and co-signed by qualified staff. Document according to AHS – Edmonton Zone Corporate Administrative Directive 2.3.5 / CH Medication Administration Policy on Medication Administration for the procedure on Medication Administration Independent Double Checks or site specific policies.

B. Document all actions, patients’ conditions/tolerance as per facility documentation guidelines. Documentation suggestions:
   i. Location and condition of the IV site pre- and post-infusion.
   ii. Type of IV catheter, gauge & length/type of urinary catheter and size.
   iii. Patency of IV catheter/urinary catheter.
   iv. Drug administered, time and route of administration, and if administered by infusion pump.
   v. Observations made during administration.
   vi. Patient response.
   vii. Co-signature, where required.
10. Extravasation

A. Definitions

Extravasation:
• For the purposes of this manual, is the leakage or inadvertent administration of a vesicant into surrounding tissue (e.g., interstitial) that may cause tissue damage to varying degrees.

Vesicant:
• A drug that has the potential to cause tissue destruction or necrosis.

Irritant:
• A drug capable of producing pain, discomfort, inflammation, or local irritation at the administration site or along the vein pathway but usually without subsequent tissue damage.

B. General Statements

• Healthcare personnel must be acutely aware of the signs and symptoms of extravasation, which include extreme discomfort, pain or burning at the site, stinging, swelling or redness, and possible absence of blood return from catheter. Extravasation can also occur without burning, stinging and even if blood returns well on aspiration. The severity is dependent upon the drug, drug concentration, site of reaction, diluent used to reconstitute the drug, admixed solution, condition of the surrounding skin and volume of extravasate.

• Patients should be educated about the symptoms suggestive of extravasation/hypersensitivity and be instructed to report these immediately should they occur.

• Patients should not leave the nursing unit during vesicant infusion and ambulation during administration is discouraged.

• If extravasation occurs, immediate treatment and follow-up management is required.
C. Extravasation Trays

1. Extravasation trays are available from Pharmacy.
2. An extravasation tray should be available where vesicants are administered.
3. The tray should be replaced immediately if used.
4. The extravasation tray contains:

   Table 3: Extravasation Tray

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 x 25 g needles</td>
</tr>
<tr>
<td>2 x 1 mL disposable syringe</td>
</tr>
<tr>
<td>2 x 3 mL disposable syringe</td>
</tr>
<tr>
<td>2 x 5 mL disposable syringe</td>
</tr>
<tr>
<td>2 x 10 mL disposable syringe</td>
</tr>
<tr>
<td>2 x 4”x4” gauze pads</td>
</tr>
<tr>
<td>1 x large zip-lock bag</td>
</tr>
<tr>
<td>4 x alcohol swabs</td>
</tr>
<tr>
<td>1 x 10 mL sodium thiosulfate 25%</td>
</tr>
<tr>
<td>1 x black indelible ink marker</td>
</tr>
<tr>
<td>1 x 50 mL dimethylsulfoxide (99%)</td>
</tr>
<tr>
<td>1 x 10 mL sterile water for injection (without preservative)</td>
</tr>
</tbody>
</table>

5. **NOTE:** A frozen ice pack or instant cold pack may also be kept on-hand for use as a cold compress. Ice/cold pack must be discarded after use in case of drug seepage from site onto the pack.
D. Treatment

1. Who May Treat Vesicant Drug Extravasations
   Only physicians, Oncology/Hematology Nurse Practitioners and specially trained Registered Nurses may manage/treat extravasations.

2. Treatment Procedure For Vesicant Drug Extravasation
   a. **Stop** infusion immediately. Leave needle/ catheter in place and immediately contact the Medical Resident or Medical Staff or other qualified staff for treatment orders.
   b. Bring extravasation kit to bedside. The kit must be available on the unit prior to administering a vesicant drug.
   c. Put on double gloves. (see section 2 C personal protective equipment).
   d. Attach a 5-mL syringe to the injection port closest to the IV catheter and aspirate as much drug as possible through the IV catheter (approximately 3 - 5 mL of blood). If a subcutaneous bleb is still present, aspirate with a syringe and 25-gauge needle and withdraw as much of the remaining solution as possible.
   e. **Remove** IV catheter.
      Exception: If the extravasation was mechlorethamine (nitrogen mustard), inject appropriate antidote (see Vesicant Drugs – Table 4) into existing IV line prior to removing catheter.
   f. Circle affected area with indelible ink marker for monitoring purposes.
   g. Continue with the treatment method outlined in the following pages for vesicant drugs.
   h. **Elevate** the extremity above the level of the heart if possible.
   i. Remove gloves. Wash hands.
   j. Dispose of contaminated waste in cytotoxic waste disposal container.

3. Treatment Procedure For Irritant Drug Infiltration
   There are no known antidotes or special procedures. The IV should be discontinued and physician notified. Treatment may include thermal manipulation, extremity elevation or any other treatments deemed appropriate through the monitoring of clinical outcomes.
4. Follow-up
   a. Document drug, volume infused, how it was infused, site appearance, date and time of event, treatment and care given, patient reaction/comments and physician involvement. The adverse event must be reported as per site/agency policy. A photo can be taken to document site of reaction.
   
b. Observe the site every shift for 48 hours and then weekly till healed. Outpatients will be monitored according to site/unit policy
   
c. Notify the attending physician at the first sign of tissue breakdown or ulceration.
E. Classification of Tissue Injury

1. Irritant Cytotoxic Drugs
   - Cytotoxic drugs that may produce pain, discomfort, inflammation, or local irritation at the administration site or along the vein pathway but usually without subsequent tissue damage.
   - These drugs generally do not have the potential to cause tissue damage unless a large amount of concentrated drug inadvertently infiltrates.

<table>
<thead>
<tr>
<th>Arsenic trioxide</th>
<th>Daunorubicin, liposomal</th>
<th>Mitoxantrone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleomycin</td>
<td>Doxorubicin, liposomal</td>
<td>Teniposide</td>
</tr>
<tr>
<td>Bortezomib</td>
<td>Etoposide</td>
<td>Topotecan</td>
</tr>
<tr>
<td>Cisplatin</td>
<td>Fluorouracil</td>
<td>Valrubicin</td>
</tr>
<tr>
<td>Table 4: Irritant Cytotoxic Drugs (not inclusive)</td>
<td>Ganciclovir</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gemtuzumab</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ifosfamide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Irinotecan</td>
<td></td>
</tr>
</tbody>
</table>
2. Vesicant Cytotoxic Drugs

- Cytotoxic drugs that have the potential to cause tissue destruction or necrosis.
- Sloughing of tissue, infection, severe prolonged pain and loss of mobility may occur as a result of vesicant drug extravasation

### Table 5: Vesicant Cytotoxic Drugs

<table>
<thead>
<tr>
<th>Vesicant Drugs</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amsacrine</td>
<td>• Elevate limb and apply gentle pressure to site. Apply COLD compresses for 15-20 minutes to site. Avoid excessive cold, which can cause tissue injury.</td>
</tr>
<tr>
<td>Busulfan</td>
<td>• Continue application of COLD compresses 4 times daily over next 3-4 days.</td>
</tr>
<tr>
<td>Carmustine</td>
<td>• For paclitaxel – warm or cold compresses have been recommended in literature.</td>
</tr>
<tr>
<td>Dactinomycin</td>
<td>Daunorubicin</td>
</tr>
<tr>
<td>Melphalan</td>
<td>Doxorubicin</td>
</tr>
<tr>
<td>Mithramycin (Plicamycin)</td>
<td>Epirubicin</td>
</tr>
<tr>
<td>Paclitaxel</td>
<td>Idarubicin</td>
</tr>
<tr>
<td>Streptozocin</td>
<td>Mitomycin</td>
</tr>
</tbody>
</table>

**Daunorubicin, Doxorubicin, Epirubicin, Idarubicin and Mitomycin**

- Elevate limb and apply gentle pressure to site. Apply COLD compresses for 1 hour to site. Avoid excessive cold, which can cause tissue injury.
- Apply a 99% DMSO solution topically and allow to air dry. Cover with a non-occlusive dressing within 10 to 25 minutes. Repeat every 8 hours for 1 week. Continue application of COLD compresses 4 times daily over next 3-4 days.

Dexrazoxane can be used for the treatment of extravasation of anthracyclines, **within 6 hours of extravasation, in patients who have not already received DMSO.** Anthracyclines include daunorubicin, doxorubicin, epirubicin and idarubicin.

Give dose daily over 3 consecutive days as an intermittent infusion in NS over 1-2 hours.

Dose is 1000mg/m2 (2000mg/day maximum dose) for Day 1 and Day 2. Dose is 500mg/m2 (1000 mg /day maximum dose) for day 3. Doses should be spaced 24 hours apart. Dose to be administered into a large vein other than the one affected by the extravasation. Reduce dose by 50% in patients with a CrCL less than 40 mL/min.
<table>
<thead>
<tr>
<th>Vesicant Drugs</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechlorethamine (nitrogen mustard)</td>
<td>• Prepare 1/6 Molar sodium thiosulfate antidote by diluting 1.6 mL of 25% sodium thiosulfate with 8.4 mL sterile water.</td>
</tr>
<tr>
<td></td>
<td>• Aspirate residual drug, then administer 5 mL of prepared sodium thiosulfate solution through existing IV line, and remove the catheter.</td>
</tr>
<tr>
<td></td>
<td>• If unable to aspirate residual drug, remove IV catheter, inject antidote in a clockwise fashion subcutaneously around the site, changing the needle (25 gauge) with each injection. Use 0.5 to 2 mL antidote for every estimated 1 mg drug extravasated.</td>
</tr>
<tr>
<td></td>
<td>• There are conflicting reports about the use of warm or cold compresses. Some reports recommend application of cold, others recommend heat.</td>
</tr>
<tr>
<td>Cisplatin -can be a vesicant with large volumes/higher concentration (if more than 20mls of 0.5mg/ml extravasates)</td>
<td>• For cisplatin- 2 mL of 1/6 Molar sodium thiosulfate (prepared by diluting 1.6mL of 25% sodium thiosulfate with 8.4 mL sterile water) can be injected subcutaneously around the site of extravasation for each estimated 100 mg of cisplatin extravasated. A new needle (25 gauge) should be used for each injection.</td>
</tr>
<tr>
<td></td>
<td>• There are conflicting reports about the use of warm or cold compresses. Some reports recommend application of cold, others recommend heat.</td>
</tr>
<tr>
<td>Oxaliplatin</td>
<td>• Elevate limb and apply gentle pressure to the site.</td>
</tr>
<tr>
<td></td>
<td>• Apply WARM compresses to the extravasation site for 1 hour. Avoid excessive heat, which can cause tissue injury.</td>
</tr>
<tr>
<td>Vinblastine</td>
<td></td>
</tr>
<tr>
<td>Vincristine</td>
<td></td>
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<tr>
<td>Vindesine</td>
<td></td>
</tr>
<tr>
<td>Vinorelbine</td>
<td>• Elevate limb and apply WARM compresses to site, with gentle pressure, for 15-20 minutes at least 4 times daily for the first 24-48 hours. Avoid excessive heat, which can cause tissue injury. Hyaluronidase 1500 units/mL in SWI or NS, infiltrated subcutaneously or intradermally in clockwise fashion in divided doses around affected site as soon as possible after extravasation can be used. Hyaluronidase (Hyalase) is available through Health Canada Special Access Programme.</td>
</tr>
</tbody>
</table>
| NOTE:                                | A frozen ice pack may be kept on hand for use as a cold compress. Wrap ice pack in a towel prior to applying to skin surface. Care must be taken to avoid tissue injury from excessive cold.
11. Cytotoxic Use at Home (Self-administration or Home Care)

A. Home Care

1. Administration of Cytotoxic Drugs by Home Care Staff
   a. Home Care staff will administer cytotoxic drugs in accordance with policies and procedures from the Home Care Interdisciplinary Clinical Policies and Procedures Manual:
      i. 4.1.05 and 4.1.05a, “Cytotoxic Drug Administration”.
      ii. 4.1.06 and 4.1.06a, “Cytotoxic Drug Spills”.

2. Disposal of Cytotoxic Drugs by Home Care Clients
   a. Patients/caregivers shall be instructed in the appropriate handling and disposal of cytotoxic waste.
      i. Refer to Appendix D for “Safety Measures for Cytotoxic Drugs” for waste handling instructions.
      ii. Home care clients shall be instructed to dispose of all cytotoxic waste in an appropriate “cytotoxic container”. Staff shall ensure that the client is aware of how to seal the container & where to take it for disposal. Waste disposal containers are available for purchase at some community pharmacies and there are community pharmacies and AHS sites which accept them for disposal.
      iii. A cytotoxic spill kit must also be available in a client’s home. Cytotoxic Spill kits may be available for purchase at some community pharmacies or the outpatient pharmacy.

B. Home Care Client Self-administration

1. Education
   Patients shall be instructed in proper handling, preparation, administration, and disposal of cytotoxic drugs.
   a. Refer to Appendix D - “Safety Measures for Cytotoxic Drugs”, for handling instructions for patients.
   b. Self-administration of subcutaneous methotrexate:
      a. For patient information on methotrexate use in pediatric rheumatic diseases and Crohn’s disease, refer to Appendix E.
      b. For information on administration of subcutaneous methotrexate, refer to Appendix F, titled “Patient Instructions for Methotrexate Subcutaneous Injections”.
      c. Complete the checklist found in Appendix G, titled “Methotrexate Subcutaneous Injection Teaching Record”, to ensure outpatients have
received the required information for administering subcutaneous methotrexate.

2. Cytotoxic Preparation by Pharmacy
   a. Whenever possible, preparation of cytotoxic drugs for use in the patient’s home shall take place in Pharmacy.

   b. Patients should be advised to obtain injectable cytotoxic drugs in the unit of use (e.g. syringes) whenever possible. When injectable cytotoxic drugs cannot be obtained in the unit of use, patients/caregivers shall be instructed in proper techniques for withdrawing drug from vials/ampoules and safe handling during preparation.

3. Self-administration of Cytotoxic Drugs
   a. Patients/caregivers shall be instructed in the appropriate administration technique and safe handling precautions for the prescribed cytotoxic drug.

   b. When the patient/caregiver is not able to administer the cytotoxic drug, a referral may be made to the Home Care program.

   c. Patients/caregivers should be instructed not to crush/split tablets or open capsules of cytotoxic drugs. Oral cytotoxic that require opening/crushing should be supplied by Pharmacy in a suspension or solution whenever possible. If this is not possible, patient should be instructed in the proper methods of preparation and safe handling during preparation.

4. Disposal of Cytotoxic Drugs used in the Patient’s Home
   a. Patients/caregivers shall be instructed in the appropriate handling and disposal of cytotoxic waste.

12. **Cytotoxic Waste Handling**

**A. Definition**

**Cytotoxic waste:**
Cytotoxic waste is any material that has become contaminated with cytotoxic drugs. These items may include needles, syringes, IV bags and administration sets, IV tubing, vials, amps, disposable gowns, gloves, masks, hair covers, medication cups, goggles, shoe covers, paper towels, plastic liners and zip-lock bags.

Cytotoxic waste also includes urine, excreta, vomitus and other body fluids from patients who have received cytotoxic drugs **within the previous 48 hours, or 72 hours in the case of cyclophosphamide**. Please note, these are guidelines and some cytotoxic drugs may be present in bodily fluid for longer than 48 hours. Qualified staff should review the product monograph of any medications they do not know for any additional special handling requirements.

**B. Procedure**

1. It is the Pharmacy and patient care unit’s responsibility to clean up spills that occur in their respective areas. In the event that the spill cannot be managed or in a public area, Environmental Services or a Code Brown can be called as per site policy/procedures.

2. All personnel involved in the preparation, delivery, and administration of cytotoxic drugs shall be made aware of the proper procedures for the safe handling, containment, and disposal of cytotoxic waste.

3. Cytotoxic waste must be disposed of in cytotoxic waste containers. Sharps must be discarded in rigid puncture-resistant plastic containers displaying a cytotoxic symbol. IV tubing sets and other waste should be placed **intact** into the cytotoxic waste containers to prevent aerosolization. Containers must be sealed after use.

4. A cytotoxic waste container must be brought to the patient’s bedside for disposal of cytotoxic waste. The container with lid closed may be stored in the patient’s room until completion of cytotoxic drug regimen if no safety issues have been identified. **Full /used cytotoxic waste containers should be securely sealed with lid and stored in a secure designated area (usually the dirty utility room) until they are picked up by environmental services for incineration. Do not store in hallway or public access areas.**

5. The cytotoxic disposal container **must** be checked for breaks or leaks before it is removed from the patient’s room and transferred to a secure soiled utility room. Containers **must not be filled to more than 2/3 of its capacity**. Pressure must never be placed on the waste to push it into the container. Prior to storage (in soiled utility room) nursing staff will...
seal the container with the lid provided. A biomedical waste barcode label must be applied to the lid. Who applies the label varies by site. See Appendix B in resource guide at http://insite.albertahealthservices.ca/Files/hr-compulsory-education-ace-resource-guide.pdf

6. Environmental services or waste management staff shall pick up the sealed cytotoxic waste containers from the designated storage area or pharmacy and transport them to an on-site secured holding area (i.e. Biomedical Waste Cold room), until taken for incineration. Environmental services or waste management staff will not handle material improperly secured.

C. Linen

1. All reusable linen not visibly contaminated with cytotoxic waste is treated as per usual standard precautions.
   - Reusable linen products shall be placed into the laundry bags.
   - Laundry bags shall be secured by tying the bag with a knot.
   - Full laundry bags shall be stored in the soiled utility area for collection by environmental services staff.

2. Reusable linen that is grossly contaminated with body secretions or cytotoxic medication is disposed of into the yellow biohazard box. For additional information see Section 13 - Spills and/or Personnel Contamination - Contaminated Clothing/Linens procedure.

3. DISPOSABLE LINENS SHOULD BE USED WHENEVER POSSIBLE.

D. Patient Waste

1. Personal protective equipment (approved double gloves, gown and a face mask/shield/goggles) must be worn if splashing/ aerosolization is possible when handling urine, excreta, vomitus, and other body fluids from patients receiving cytotoxic drugs within the previous 48 hours. Discard cytotoxic urine, excreta or vomitus waste into the toilet. Double flush when discarding cytotoxic waste in toilet. For toilets that splash when flushed, place a disposable pad over the seat before flushing and discard pad after use into a cytotoxic waste container. Certain drugs may require cytotoxic handling precautions for greater than 48 hours. It is the responsibility of the qualified staff to be aware of these exceptions and follow appropriate precautions. Qualified staff should review the product monograph of any medications they do not know, for any additional special handling requirements. Cytotoxic handling precautions are only required for the first 48 hours or as dictated by cytotoxic drug excretion patterns. Thereafter, usual handling of patient waste should be followed.

2. Diapers soiled with urine and/or excreta from patients receiving cytotoxic drugs within the previous 48 hours must be handled with disposable gloves suitable for handling cytotoxic drugs and discarded into a biohazard waste disposal box lined with a yellow biohazard waste labeled plastic bag. Certain drugs may require cytotoxic handling precautions for
greater than 48 hours. It is the responsibility of the qualified personnel to be aware of these exceptions and follow appropriate precautions. Qualified staff should review the product monograph of any medications they do not know, for any additional special handling requirements. Cytotoxic handling precautions are only required for the first 48 hours or as dictated by cytotoxic drug excretion patterns. Thereafter, usual handling of patient waste should be followed.

3. Some EXCEPTIONS:
   a. For waste handling of urine voided within 8 hours following BCG, mitomycin or thiotepa bladder instillations, refer to Administration Guidelines – Bladder Instillations (section 8).
   b. Cyclophosphamide is found in bodily fluids for longer periods; therefore precautions shall be followed for at least 72 hours after a dose.

E. Final Disposal

Cytotoxic waste is transported from the site of generation to a secured holding area where it will be removed and taken for incineration by a licensed waste transportation contractor. Cytotoxic waste is incinerated at a temperature of 1000º C or greater to ensure complete destruction.

F. Cleaning of Patient’s Room after Cytotoxic Drug Administration

Routine cleaning of room is recommended unless a spill has occurred. If a spill has occurred, follow procedure for a spill clean-up.
13. Spills and/or Personnel Contamination

A. Cytotoxic Spill Kits

Patient care areas and departments (e.g. Environmental Services, Pharmacy) involved in preparation, handling and administration of cytotoxic drugs should have a cytotoxic spill kit on hand. Alternatively, spill kits can be supplied when cytotoxic medications are dispensed or staff can be educated as to the location of the nearest spill kit or where to obtain a spill kit. Staff will be aware of the location of kit, be familiar with the contents and follow instructions for the use of the kit as determined by site policies and procedures. Personal fit tested N-95 mask should be used in spill management. Do not use mask in kit if it is not a N-95 mask or if it is a N-95 mask which does not fit properly. Appropriate shoe covers and head bonnet may also be required and should be readily available in the event of a spill. Circumstances of and handling of spills should be documented as per site/agency policy. Spill kits should be inspected periodically to ensure that the contents have not expired and are suitable for use.

Cytotoxic SPILL KIT CONTENTS:

1 pair safety goggles  
1 disposable moisture resistant long sleeved gown with cuffs - large  
2 pairs of gloves approved for handling hazardous /chemotherapy drugs (non-latex preferred)  
1 N-95 mask (use own fitted N-95 mask if one in kit does not fit)  
2 yellow biohazard waste garbage bags (1 small & 1 large)

Kits may also contain:  
Absorbent powder (e.g. Chemosorb®)  
Plastic disposable scoop  
2 absorbent towels  
“Caution” sign

B. Accidental Exposure

All accidental exposures to employees are to be reported to immediate supervisor or designate and the appropriate WHS service. If a patient is directly involved, the most responsible physician must be notified, followed by completion of an adverse event report according to site policies.

1. Contaminated Clothing/Linens

a. Contaminated clothing/linens must be handled with double gloves. Proper personal equipment should be worn at the discretion of qualified staff based on the risk of contamination.
b. Remove contaminated clothing and/or bed linens as soon as possible. Ensure that the wet linen does not contaminate other surfaces.

c. Avoid shaking the linens as this may release contaminated particles.

d. Wrap linen to contain the spill.

e. Discard hospital linens and clothing into yellow biohazard waste bags (provided in the Cytotoxic Spill Kit). Seal the bag, and place in a large cytotoxic disposal container in the soiled utility area for pick up by environmental services or waste management staff.

f. Personal items may be placed in a plastic yellow biohazard waste bag and taken home to launder if desired. Patients should handle these items with double gloves. Wash separately, and then wash again. Do not dry clean contaminated items. Alternatively, if the patient does not wish to keep their personal items, they can be placed into yellow biohazard waste bags and discarded in the same manner as hospital linens noted above.

g. Wash hands with soap and water after handling these items.

2. Eye/Skin Contact

a. Flush the affected eye(s) or skin with copious amounts of water or NS for at least 15 minutes.

b. For skin contact, wash with soap and water.

c. Consult the MSDS sheet for further instructions.

d. If, after following steps as outlined above, the staff member is still experiencing symptoms of injury, seek medical attention as soon as possible for immediate assessment.

e. Report to incident to the appropriate WHS service and complete forms as required.

f. If contact lenses are involved, these must be removed immediately and discarded into cytotoxic disposal container.

3. Skin Punctures / Needle Stick Injury

a. Remove gloves and/or contaminated clothing.

b. Wash the puncture site thoroughly with soap and warm running water for 15 minutes. Allow wound to bleed freely. Puncture area may be squeezed to encourage bleeding to flush out any drug that may have been injected accidentally.
c. Treat as an extravasation if required, and follow guidelines outlined in the extravasation procedures (see section 10).

d. Report incident to the appropriate WHS service and complete forms as required

4. Inhalation

a. Medical attention must be sought for immediate assessment when cytotoxic drugs are inhaled.

b. Report incident to the appropriate WHS service and complete forms as required.
C. Environmental Contamination

Responsibility for cleanup of spills in Pharmacy and Patient Care Units rests with the staff in the area involved. In the event that the spill cannot be managed by existing staff at site of spill, Environmental Services or a CODE BROWN can be called as per site policies/procedures.

a. First attend to anyone who has been splashed with cytotoxic waste.

b. Inform the immediate supervisor. Inform the attending Resident or Staff Physician if a patient is directly involved.

c. After individual(s) requiring care for contamination has been assisted, next priority is spill containment.

d. Assess the size and scope of spill and request for trained help if required. More than 1 cytotoxic spill kit may be necessary. For spills that cannot be managed with existing staff or a spill in public areas, Environmental Services or a CODE BROWN can be called as per site policies/procedures.

e. Bring cytotoxic spill kit and a puncture-resistant cytotoxic disposal container to the area of the spill. One kit and container should be on-hand at all times in areas where cytotoxic drugs are administered, stored or prepared.

f. Identify and isolate the contaminated area to prevent people from approaching and spreading the contamination. Display “Caution” signage from Cytotoxic Spill Kit.

g. Alert other individuals in the area and the Pharmacy department of the spill if drug replacement is required. After hours, notify the pharmacist on call to remake the dose if therapy cannot be held until the next day.

h. DO NOT touch spill with unprotected hands. Put on personal protective equipment: double gloves, N-95 mask, goggles and disposable gown, head and shoe covers. See Table 1 for further details.

i. Once fully attired with appropriate PPEs, contain spill using cytotoxic spill kit. Spill cleanup should proceed from areas of lesser to greater contamination.

j. After absorbing/cleaning up spill using disposable towels, wash area with a household detergent and water. (Cavi wipes are not recommended) Rinse area with water. Wipe dry. Remove contaminated PPE according to Appendix B.

k. Call Environmental Services to thoroughly wash affected floor area.

l. Disposal – see “Cytotoxic Waste Handling” – section 12.

m. Document the nature and extent of all spills according to site policies/procedures.

n. Replace cytotoxic spill kit.
1. Liquid Spills
   
a. If a patient receiving an oral cytotoxic drug vomits within 30 minutes after the dose, wearing appropriate PPEs clean spill with warm soapy water and a disposable cloth.

   b. Absorb spill with absorbent material (disposable towels or absorbent powder provided in cytotoxic spill kit).

   c. Apply the absorbent material gently, being careful not to touch the spill with your hand or to generate aerosols. If using powder, scoop up the moistened powder with disposable dustpan and brush or scraper.

2. Powder Spills
   
   If the spill is dry (in powder form) carefully pick up with disposable towels or absorbent pads moistened with water. Wipe up, being careful to avoid generating aerosols.

3. Sharps
   
   Sweep up sharp material (broken glass, needles, etc.) using a disposable dust pan and brush or scoop (available in cytotoxic spill kit). Place all sharps into puncture resistant cytotoxic disposal container.

4. Biologicals
   
   For spills of live concentrated mycobacteria (e.g., BCG), the contaminated surface must be covered with enough bleach (20 – 100% concentration) to allow the surface to remain wet for 10 – 15 minutes. Then remove the bleach with absorbent material.

5. Reusable Equipment
   
   a. Wash with household detergent and water. Rinse with water.

   b. Wipe dry.

6. Disposal
   
   a. Dispose of all contaminated material (absorbent pads, powder, dustpan etc.) in yellow biohazard waste garbage bag followed by outer pair of gloves.

   b. Tie yellow garbage bag for disposal and place in cytotoxic waste container.
c. Remove personal protective equipment (gown, mask, contaminated goggles and inner pair of gloves) and place in second yellow biohazard waste bag. Place bag in cytotoxic waste container.

d. Wash hands thoroughly after removing inner pair of gloves.

e. Goggles, if only minimally or not contaminated, may be cleaned with soap and water. Double gloves should be worn when washing goggles.
14. Preparation of Cytotoxic Drugs

- **Whenever possible**, preparation of cytotoxic drugs shall take place in Pharmacy in a biologic safety cabinet.
- **Whenever possible**, a suspension must be supplied or prepared by pharmacy for administration of any doses that require opening of capsules or crushing/splitting of tablets.
- **If impossible** and preparation/manipulation/compounding of a cytotoxic drug is necessary on unit or outside of a biologic safety cabinet, recommendations are as follows:
  - Preparation should occur in an isolated area away from drafts and traffic.
  - Double gloves, DMR gown, and N-95 mask must be worn.
  - The work surface should be covered with a **disposable plastic back pad**.
  - Contaminated equipment/work surfaces should be cleaned with water saturated gauze first and clean again with household detergent and water and rinse.
  - Contaminated materials should be discarded in a cytotoxic waste container.
15. Bibliography

- denotes references added since previous version of manual


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16. **Appendices**

A. List of Cytotoxic Drugs

B. Putting on (Donning) Personal Protective Equipment

C. Doffing (Removing) Personal Protective Equipment

D. Safety Measures for Cytotoxic Drugs

E. Patient Information Sheet: Methotrexate for Pediatric Rheumatic Disease and Crohn’s Disease

F. Patient Instructions for Methotrexate Subcutaneous Injection

G. Methotrexate Subcutaneous Injection Teaching Record
### Appendix A: List of Cytotoxic Drugs

<table>
<thead>
<tr>
<th>Cytotoxic Drugs (not inclusive)</th>
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<tbody>
<tr>
<td><em>Aldesleukin</em></td>
</tr>
<tr>
<td><em>Actinomycin D</em></td>
</tr>
<tr>
<td><em>Altretamine</em></td>
</tr>
<tr>
<td><em>Amsacrine</em></td>
</tr>
<tr>
<td><em>Arsenic trioxide</em></td>
</tr>
<tr>
<td><em>Asparaginase</em></td>
</tr>
<tr>
<td><em>Azacitidine</em></td>
</tr>
<tr>
<td><em>Azathioprine</em>*</td>
</tr>
<tr>
<td><em>Bleomycin</em></td>
</tr>
<tr>
<td><em>Bortezomib</em></td>
</tr>
<tr>
<td><em>Busulfan</em></td>
</tr>
<tr>
<td><em>Capecitabine</em></td>
</tr>
<tr>
<td><em>Carboplatin</em></td>
</tr>
<tr>
<td><em>Carmustine</em></td>
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<tr>
<td><em>Chlorambucil</em></td>
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<tr>
<td><em>Cidofovir</em>*</td>
</tr>
<tr>
<td><em>Cisplatin</em></td>
</tr>
<tr>
<td><em>Cladribine</em></td>
</tr>
<tr>
<td><em>Clofarabine</em></td>
</tr>
<tr>
<td>*Cyclophosphamide†</td>
</tr>
<tr>
<td><em>Cytarabine</em></td>
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</table>

Medications on this list are antineoplastic (used in the active treatment of cancer) except otherwise indicated.

**This medication is a non-antineoplastic cytotoxic drug
†This medication has been used for antineoplastic and non-antineoplastic indications
* Medications listed on the National Institute for Occupational Safety and Health (NIOSH) list of antineoplastic and other hazardous drugs in healthcare setting.
Appendix B: Putting on (Donning) Personnel Protective Equipment

Personnel Protective Equipment must be put on in the order below. See website http://insite.albertahealthservices.ca/ipc/tms-ipc-donning.pdf

1. **Wash hands with soap and water.**
   NOTE: If hands are not visibly soiled, use of an alcohol based hand rub is acceptable.

2. Put on gown.

3. Put on fit-tested **N95 mask:**
   a) Pre-stretch top and bottom straps before placing mask on the face.
   b) Cup the mask in your hand, with the nosepiece at your fingertips, allowing the headbands to hang freely below your hand.
   c) Position the mask under your chin with the nosepiece up. Pull the top strap over your head resting it high at the top back of your head. Pull the bottom strap over your head and position it around the neck below the ears.
   d) Place fingertips from both hands at the top of the metal nosepiece. Using 2 hands, mold the nose area to the shape of your nose by pushing inward while moving your fingertips down both sides of the nosepiece.
   e) Perform a user seal check prior to each wearing. To check the mask-to-face seal, place both hands completely over the mask and exhale. Be careful not to disturb the position of the mask. If air leaks around the nose, readjust the nosepiece as described in step (d). If air leaks at the mask edges, work the straps back along the sides of head.

4. Put on **head cover** if required. The head cover must be put on after the fit tested N95 mask is in place.

5. Put on goggles and face shield if required.

6. Put on shoe covers if required.

7. Put on gloves
   - Inner pair under the cuff of gown, outer pair over the cuff of gown.
Appendix C: Doffing (Removing) Personnel Protective Equipment (PPE)

Remove and dispose of PPE in the following order see website http://insite.albertahealthservices.ca/ipc/tms-ipc-doffing.pdf:

1. **Remove outer pair of gloves** by touching only the outside of the first outer glove with the second outer glove and the inside of the second outer glove with an inner glove in order to avoid contaminating the inner pair. (See attached diagram)

   When removing gloves, turn gloves inside out so that contaminated surfaces do not touch uncontaminated surfaces.

2. **Remove gown** by carefully unfastening ties and grasping the outside of the gown at the back of the shoulders and pulling the gown down over the arms. Turn the gown inside out during removal and dispose in cytotoxic / biohazard waste container.

   Note: Gowns may be folded to the inside and re-used only if not visibly contaminated. Gowns may be used for a maximum of one day, for one patient only before disposal. Gowns must not be shared among staff members.

3. **Remove inner pair of gloves** by touching the outside of the first inner glove with the second inner glove and the inside of the second inner glove with the bare hand.

4. **Wash hands with soap and water.**

5. **Put on new pair of gloves.**

6. **Remove goggles / shield** by handling only the headband or ear pieces. Dispose if grossly contaminated or put aside on plastic back absorbent pad for cleaning if it is to re-use.

7. **Remove N95 mask** in the following manner:
   - Bend forward slightly and carefully remove mask by touching only the ties or elastic bands.
   - Pull bottom strap over head first, then, pull top strap over head and remove.
   - Discard mask in biohazard/cytotoxic waste disposal container.

8. **Remove head cover** if present.

9. **Remove shoe covers** if present.

10. **Remove gloves.**
    - Turn gloves inside out so that contaminated surfaces do not touch uncontaminated surfaces.

11. Dispose of PPE as cytotoxic waste into a biohazard / cytotoxic waste disposal container.

12. **Wash hands with soap and water.** Do not use hand sanitizer as this does not remove chemical contamination.
Removal of Double Gloves

To remove outer pair of gloves:

Grasp outer glove on hand 1 with hand 2 and remove touching only the outside of the glove to avoid contaminating the inner pair.

Pull outer glove 2 with hand 1, touching only the inside of the glove.

To remove inner pair of gloves:

Pull gloves to free them from the cuffs of the gown. Touch only the outside of the gloves.

With gloved hand 1, remove glove on hand 2 by grasping it on the outside.

With bare hand 2, insert fingers under the cuff of remaining glove and remove.
Safety Measures for Cytotoxic Medications

What is a cytotoxic medication?
You have been given a medication called ________________. It will help you, but it needs to be handled in a safe manner as it is cytotoxic. This means that it may cause irritation or harm if it spills and touches your skin, or if you breathe it in through your nose.

How do I keep my medication safe?
Keep the medication in a plastic container that will not leak. Store it away from other medications and food. Keep your medication out of reach of children and pets. Return unused medication to the pharmacy or site that gave it to you.

Do I need to be concerned about my body fluids?
Your body fluids may contain small amounts of your medication while you are taking it. The body fluids include urine, bowel movements, blood, vomit, saliva, sweat, vaginal secretions, and semen.

How do I handle my body fluids safely?
You and your caregiver should avoid direct contact with your body fluids. Put the lid down before flushing the toilet and flush twice. Wash your hands well. Wash skin thoroughly if it comes in contact with urine, bowel movements or other body fluids.

If you or your caregiver has eye contact with your medication or body fluids, flush the affected eye with water for 15 minutes, and then contact your clinic or family doctor.

<table>
<thead>
<tr>
<th>Skin contact</th>
<th>Rinse with large amounts of water, then wash thoroughly with soap and water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>Flush affected eye with water for 15 minutes</td>
</tr>
</tbody>
</table>

Is it safe for me to have physical contact with others?
Casual contact like hugging, kissing and touching is safe. Use a condom when having sex (whether it’s vaginal, anal or oral). This prevents secretions from coming in contact with your partner’s body.

How do I protect my caregiver?
Pregnant or breast-feeding women should avoid handling these medications. If it is unavoidable, these individuals should make a special effort to follow these guidelines.

Your caregiver should wear gloves when:
- Handling the medication or any items that may contain your body fluids.
- Washing non-disposable items.
- Emptying wastes from a bedpan, basin, urinal, or commode.

Always wash hands thoroughly after removing gloves.

Over →
What if I spill my medication or body fluids?

In the event of a spill, when possible avoid contact with the medication or spreading the spill. These guidelines should be followed:

- Put on gloves
- Soak up the spill with disposable incontinence pads or adsorbent paper towel.
- Clean the affected area twice with soap and warm water using disposable rags or paper towels.
- Rinse the area with clean water.
- Follow the guidelines for handling laundry and disposing of garbage.
- Spill kits containing everything you need to clean a spill are available for purchase at some community pharmacies.

What about washing non-disposable items and laundry?

All non-disposable items or laundry that come in contact with medications or body fluids should be washed.

Oral syringes and medication cups must be washed thoroughly with soap and water between each use.

Rinse other equipment like bedpans, basins, or urinals with water after use. Wash them with soap and water at least once a day.

Laundry items should be washed as soon as possible. Wash these items separately first, then wash a second time either separately or with your regular laundry. If laundry cannot be washed right away, place them in a double bag that is tied shut.

Wash dishes in the usual way with your other dishes.

What about garbage?

Dispose of all used medication containers, vials, syringes, and needles into a rigid, puncture-proof, leak-proof sealable container (e.g., sharps container, bleach bottle). You may also purchase these disposal containers at some community pharmacies. You may dispose of your puncture-proof container at a pharmacy that accepts this type of waste, or as instructed by your nurse as per the policy in your community.

All other disposable items that come in contact with body fluids or medications should be double bagged before discarding in the garbage. These items may include dressing supplies, paper towels, pads, disposable diapers, ostomy supplies, gloves, etc.

How long do these safety measures need to be followed?

You need to follow safety measures while you are taking the medication and for _______ days after.
APPENDIX E

METHOTREXATE for Pediatric Rheumatic Diseases and Crohn’s Disease

What is methotrexate?
Methotrexate belongs to a group of medicines called disease-modifying antirheumatic drugs (DMARD’s).

Methotrexate may be taken along with anti-inflammatory drugs like ibuprofen (MOTRIN®) or naproxen (NAPROSYN®), along with low doses of prednisone or with other DMARD’s. It may begin to work as early as three to six weeks after beginning treatment but can take as long as two to three months.

What is methotrexate used for?
- Arthritis and rheumatic diseases: It has been used for many years in the treatment of rheumatoid arthritis and juvenile arthritis. It may also be used in the treatment of other rheumatic diseases including juvenile dermatomyositis and psoriatic arthritis.
- Crohn’s disease: It may be used in children with chronic active Crohn’s disease, or to maintain remission.
- Cancer: It is also used in the treatment of children with different cancers, but in much larger amounts than you are taking.

How do you take methotrexate?
- Methotrexate is taken once a week only. You can develop serious side effects if taken more than once per week.

- Take the medicine on the same day each week. Mark it on calendar to remind yourself when to take your dose. If you forget when to take the drug, call your doctor before you take the next dose.

- If you miss taking your weekly dose, do not take the missed dose later in the week and do not double your next dose. Go back to your regular schedule, and tell your doctor.

- Methotrexate can be given by mouth (orally), or by injection either under the skin (subcutaneous), or into the muscle (intramuscular). Your doctor will decide on the best way for you to take the methotrexate.

If given by injection, it is given all at once. Injections may be used for people who do not respond to oral methotrexate or who develop side effects such as nausea or stomach upset.
If taken by mouth (orally), the methotrexate dose may be taken all at once, or the dose may be split into two or three smaller doses and taken over one day.

What special instructions do you need to know?

- Methotrexate is considered very safe in the amounts that you are taking for your condition. However, there are precautions you should take to keep exposure to the drug to a minimum. For instructions, please refer to the pamphlet supplied to you called, “Safety Measures for Cytotoxic Medications”.

- Do not become pregnant while taking methotrexate, as this medication may cause birth defects.

- Regular laboratory tests are necessary to check for side effects. Before starting this drug, they will do tests to check your blood, liver, and kidneys. After you start taking methotrexate, you will have regular tests to check your blood and liver. You may need to have blood tests more often when you start taking the medication and less often when you are on maintenance therapy.

- Some people taking methotrexate become more sensitive to sunlight. Avoid prolonged exposure to sunlight or sunlamps, and use sunscreen or protective clothing.

Are there side effects from taking methotrexate?

- Side effects can happen in some people taking methotrexate, tell your doctor if you have any side effects

- At the low weekly amounts you are taking, serious side effects are rare. The most common side effects include upset stomach, nausea, vomiting and loss of appetite, diarrhea or mouth sores. Less frequent or rare side effects include fever, sore throat, black or tarry stools, yellowing of the skin or eyes, bleeding or bruising, shortness of breath, and painful urination.

- Taking folic acid supplements may decrease some of the side effects with methotrexate – your doctor will discuss this with you.
When should you call your doctor?

- Tell your doctor right away if you have any side effects. A change in the dose or in how you take methotrexate may reduce these side effects.

What can you do to help?

- Tell your pharmacist, dentist, and other doctors that you are taking this medicine.

- Some medications can prevent methotrexate from working well, or cause more side effects. Tell your doctor and pharmacist which medicines or natural/herbal products you are taking, including other anti-inflammatories (like aspirin or ibuprofen), antibiotics, and diabetic medications.

- Avoid drinking alcohol while you are taking methotrexate, as it may increase the chance of liver problems.

- Keeping your laboratory and doctors appointments is important because most of the side effects can be detected and managed before they become serious.

Notes:

Prepared by: Lorraine Delano, Pharmacist, Stollery Children’s’ Hospital
Verla Chatsis, Regional Drug Information Centre

Last revised: May 1, 2013
APPENDIX F

Patient Instructions for Methotrexate Subcutaneous Injections

Contacts:
- Your clinic nurse: ________________________________
- Your family doctor or rheumatologist: ________________

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Sterile Technique .................................................................................................................. 3
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Preparing a Syringe with Methotrexate ........................................................................... 5
Injecting the Medication ..................................................................................................... 6
Important Points to Remember .......................................................................................... 7
Methotrexate Injection Record ........................................................................................... 8
Parent Worksheet

Your nurse will help you fill out this worksheet.

Name of the medication your child is receiving: ____________________________

Medication dosage: ______________________________________________________

The volume of medication your child is receiving is: ________________________ milliliters (mL) Note that cc (cubic centimeter) = mL

On the diagram below, fill in this volume by colouring in the syringe for an easy reference.

Day the medication is to be given: ______________________________________
Guidelines for Hand Washing

Hand washing is the most important thing you can do to prevent infection. We know bacteria (germs) live on our hands. The purpose of good hand washing is to remove as many bacteria as possible. Friction when lathering your hands and wrists is important.

The following hand washing procedure is recommended:

1. Take off all rings, bracelets and your watch.
2. Turn on the water. Use a comfortable temperature.
3. Wet your hands and wrists.
4. Make lather with the soap. Spread the lather over your hands and wrists. Rub well for 1 minute.
5. Rinse your hand and wrists. Hold your hands up, after rinsing, so the water does not run down your clean hands.
6. Dry your hands on a clean towel or a paper towel.
7. Turn the taps off with the towel.

Sterile Technique

Sterile means free of bacteria (germs) causing infection. When preparing an injection, you must carefully follow the principles of sterile technique. This will prevent bacteria from causing an infection.

You should know that:

1. A sterile object becomes contaminated (unsterile) when it touches a non-sterile object.  
   Example: If a sterile needle touches your finger, the needle becomes contaminated and you cannot use it. You must discard it.
2. Sterile materials must be kept dry. This is because moisture allows bacteria to grow.
3. Before you insert a sterile object through an unsterile surface, you must always clean the surface.
   Example: Clean the top of the bottle before you put the needle into the bottle.
Choosing a Subcutaneous Injection Site

1. Three recommended injection sites include: (1) the front of the middle thighs; (2) the outer area of the upper arms; and, (3) the abdomen, except for the two-inch area right around the navel.

2. Rotate the site for each injection. Do not inject into areas where the skin is tender, bruised, red, or hard. Avoid areas with scars or stretch marks.

3. If you have psoriasis, you should try not to inject directly into any raised, thick, red, or scaly skin patches (“psoriatic skin lesions”).

4. Your nurse will discuss with you which angle of insertion is best for your child. They include:

Preparing a Syringe with Methotrexate

**Equipment**
- Methotrexate vial
- 27-gauge needle
- 1 mL or 3 mL syringe
- Chlorhexidine swab
- Disposable gloves

**Procedure**
1. Prepare a clean working area. Wash your hands and then put on a pair of gloves.
2. Check medication vial for changes in colour, cloudiness, and expiry date.
3. Remove cap from medication vial and discard. Wipe the top of the vial with a chlorhexidine swab.
4. Attach needle to syringe taking care not to let the end of the needle or syringe touch anything. Pull needle cap straight off.
5. Pull back the syringe plunger to draw ________ mL of air into the syringe.
6. With the medication vial on flat surface, push air into the medication bottle.
7. Turn vial upside down with the syringe in it.
8. Pull back the plunger slowly to withdraw ______ mL of medication. Check dose again.
9. Remove the needle from the vial. Keep needle end up and do not touch the needle.
10. Gently tap the syringe to clear air bubbles. Gently push plunger to get rid of air from end of syringe.
11. Recap the needle and place syringe on a flat surface.
Injecting the Medication

**Equipment**
Syringe and needle filled with medication
Chlorhexidine swab(s)

**Procedure**
1. Using a circular motion, clean injection site with a swab. Allow area to dry.
2. Hold the barrel of the syringe with one hand and pull the needle cover straight off. Do not touch the needle or allow it or touch any surface.
3. Do not touch or bump the plunger of the syringe. Doing so could cause the liquid to leak out.
4. With one hand, gently pinch the cleaned area of skin and hold it firmly.
5. With the other hand hold the syringe, like a pencil, at a 45° – 90° degree angle to the skin.
6. With a quick “dart-like” motion push the needle into the skin.
7. After the needle is inserted, let go of the skin. Slowly push the plunger all the way down to inject the medication.
8. When the syringe is empty of the medication, pull the needle out of the skin, being careful to keep it at the same angle as inserted.
9. There may be a little bleeding at the injection site. You can press a cotton ball or gauze over the injection site for 10 seconds. Do not rub the injection site. If needed you may cover the injection site with a bandage.
Important Points to Remember

- For information on handling and disposing of methotrexate, please see the sheet titled, “Safety Measures for Cytotoxic Medications”.
- Use a new pair of gloves each time you give the subcutaneous injection.
- Dispose of used needles, syringes and used methotrexate vials in a puncture proof “cytotoxic” container.
- Keep cytotoxic container in a safe location and out of reach of children.
- Keep a record of injection dates, sites, and amount given. This record is on the next page – bring it to each clinic visit.

Methotrexate Vials

- For information on how the drug works, side effects and other precautions, please refer to the patient information sheet titled, “Methotrexate for Pediatric Rheumatic Diseases and Crohn’s Disease”.
- Store the methotrexate vial(s) in the original container in a dark, dry, and cool cupboard out of reach of children or pets. Do not refrigerate.
- Before you administer the drug, double-check the name of the medication (methotrexate), concentration of the medication (25 mg/mL), and the expiry date.
- Check to see if the vial has a preservative. Your pharmacist can help you with this.
- For vials WITH preservative (once the bottle is opened):
  1. Write the date opened on the bottle
  2. This vial of medication can be re-used for up to 4 weeks after it was first opened.
  3. Clean the methotrexate vial top with a chlorhexidine swab first before you give each subcutaneous injection.
- For vials WITHOUT preservative, use a new vial of medication with each injection. Do not re-use the methotrexate vials.
# Methotrexate Injection Record

<table>
<thead>
<tr>
<th>Date of Injection</th>
<th>Amount (dose) injected</th>
<th>Site of Injection</th>
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# Methotrexate Subcutaneous Injection Teaching Record

Date ___________________  Instructed by __________________________________

## Learner(s) (please ✓):
- Client
- Caregiver (name/relationship) __________________________________
- Other (name/relationship) ______________________________

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Return Demonstration</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Selection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Identifies areas for subcutaneous site rotation</td>
<td></td>
<td></td>
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<tr>
<td>2. Selects appropriate site for subcutaneous injection</td>
<td></td>
<td></td>
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<tr>
<td>3. Checks injection site area for suitability</td>
<td></td>
<td></td>
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<tr>
<td><strong>Preparation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Demonstrates proper hand washing technique</td>
<td></td>
<td></td>
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<tr>
<td>2. Demonstrates proper set up for supplies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Knows difference between clean and sterile</td>
<td></td>
<td></td>
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<tr>
<td><strong>Medication Preparation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Demonstrates connecting needle to syringe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Demonstrates drawing up of medication into syringe</td>
<td></td>
<td></td>
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<tr>
<td>3. Checks for air bubbles</td>
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<tr>
<td><strong>Angle of Injection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Determines angle (45°-90°) for injection</td>
<td></td>
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<tr>
<td><strong>Administration Technique</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Cleans skin with antiseptic agent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Pulls cap off needle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gently pinch &amp; hold skin firmly for injection</td>
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<td></td>
</tr>
<tr>
<td>4. Properly positions syringe &amp; needle</td>
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<tr>
<td>5. Withdraws needle &amp; syringe at the same angle</td>
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<tr>
<td>6. Applies gentle pressure to the site</td>
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<tr>
<td><strong>Disposal/Clean-up</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Disposes used supplies safely</td>
<td></td>
<td></td>
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<tr>
<td>2. Cleans workspace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Washes hands</td>
<td></td>
<td></td>
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<tr>
<td><strong>Injection Record</strong></td>
<td></td>
<td></td>
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<tr>
<td>1. Records injection site and date</td>
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</tr>
<tr>
<td><strong>Safety Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Safe handling and administration of medication</td>
<td></td>
<td></td>
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<tr>
<td>2. Handling body fluids and waste disposal</td>
<td></td>
<td></td>
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<tr>
<td>3. Handling a medication spill</td>
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</tbody>
</table>

## Problem Solving

1. Knows what potential complications to look for  Yes __________  No __________
2. Knows what to do if problems arise  Yes __________  No __________
3. Knows who to call if problems arise  Yes __________  No __________

## Teaching Materials given to the Client/Caregiver (please ✓):
- Patient Instructions on Subcutaneous Injections
- Methotrexate for Pediatric Rheumatic Diseases and Crohn's Disease, Capital Health
- Safety Measures for Cytotoxic Medication, Capital Health

## Other Instructions:
________________________________________________________________________
________________________________________________________________________