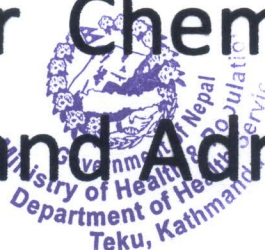


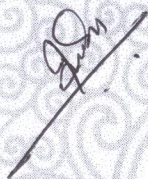
Protocol for Chemotherapy Preparation and Administration



Government of Nepal
Ministry of Health and Population
Division of Health Services
Nursing and Social Security Division
2076/077

About the protocol

This protocol aims to provide information about safety issues related to chemotherapy preparation, chemotherapy administration, extravasations management, spill management and cytotoxic waste management to get uniformity in all settings in Nepal.



Prachin



Abbreviations

Bio Safety Cabinet

Deoxyribo Nucleic Acid

5-Fluorouracil

Personal protective equipment

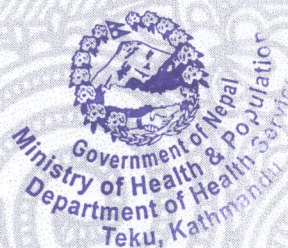
Population Based Cancer Registry

Polyvinyl Chloride

Ribo Nucleic Acid

World Health Organization

Prakash



Abbreviations

BSC
DNA
5-FU
PPE
PBCR
PVC
RNA
WHO

Bio Safety Cabinet
Deoxyribo Nucleic Acid
5-Fluorouracil
Personal protective equipment
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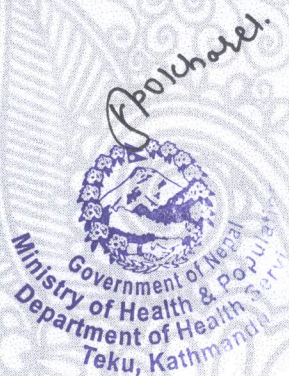
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Chemotherapy Preparation & Administration

Introduction

Cancer is the second leading cause of death globally. World Health Organization (WHO) estimated 9.6 million cancer related deaths in 2018, accounting about 1 in 6 deaths due to cancer. Exact incidence of cancer is not available in Nepal. There are different modalities for cancer treatment including surgery, radiotherapy, chemotherapy, hormonal therapy, immune therapy and targeted therapy. Chemotherapy is used widely for almost all types of cancer with estimated use to double in the next 20 years. This warrants more skilled nurses for chemotherapy administration in the future. Chemotherapy regimens are complex, delivered cyclically over extended periods from various routes, and may involve the use of peripheral or central access for intravenous routes. Abbreviations, nomenclatures, acronyms and dose calculation methods can lead to inappropriate dosing when not fully understood by the staff applying them. Many chemotherapy drugs are highly toxic to cells. Health care professionals may be at risk of exposure with drugs and their waste during preparation, administration and disposal. Patient and family members can also be exposed to the hazards of chemotherapy drugs when they handle contaminated equipment or body fluids. This signifies the issue of safety. Chemotherapy preparation and administration errors, though globally recognized potentially fatal issues, should be preventable, error free and competent chemotherapy administration processes are crucial. It has produced unopposed need of adoption of protocol for chemotherapy preparation and administration and adherence to the same



Chemotherapy

Introduction

Chemotherapy usually refers to use of drugs to treat cancer. Chemotherapy drugs are used either alone or in combination. These drugs vary widely in their forms, chemical composition, mode of action, indications, and side effects. These can be administered in different routes like intravenous (IV), oral, intrathecal, intravesical, intramuscular, intracavitary, topical. Intravenous is the most commonly used route followed by oral one. Chemotherapy can be used as single drug therapy but most of the time, a combination of two or more drugs are used together in a defined course named as regimen or protocol. It is repeated after certain days, usually every three weeks or two, often termed as cycle. Each cycle can last single day or more than that. Many regimens are abbreviated as acronyms, e.g. CHOP (Cyclophosphamide (C), Doxorubicin (H), Vincristine (O) and Prednisolone (P)). Optimal dose of chemotherapy is a must. Suboptimal dose can not kill cancer cells while overdose can produce toxicities. Care should be taken to calculate and prepare the dose properly.

Classification of Chemotherapy

Chemotherapy drugs can be classified by various ways. Chemotherapy drugs can be grouped into following according to their mechanism of action.

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Alkylating agents	directly damage DNA	Cyclophosphamide, Ifosphamide, and Melphalan
Platinum drugs	similar to alkylating agents	(Cisplatin, Carboplatin, and Oxaliplatin)
Antimetabolites	interfere with DNA and RNA reproduction by substituting for normal building blocks of RNA and DNA. Damage cells during S phase	5-fluorouracil (5-FU), Capecitabine, Cytarabine, Floxuridine, Fludarabine, Gemcitabine, Methotrexate, and Pemetrexed.
Anti-tumor antibiotics	work by altering DNA to keep them from growing and multiplying	Anthracyclines; Daunorubicin, Doxorubicin, Epirubicin, and Idarubicin Non-Anthracyclines; Actinomycin-D, Bleomycin, and Mitomycin-C
Topoisomerase inhibitors	interfere with enzymes called topoisomerases, copying of DNA	Etoposide, Topotecan, and Irinotecan.
Mitotic inhibitors	plant alkaloids and work by stopping mitosis in M phase	Taxanes (Paclitaxel, Docetaxel) and Vinca alkaloids (vinblastine, Vincristine, Vinorelbine).



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Chemotherapy can be used as single drug therapy but most of the time, a combination of two or more drugs are used together in a defined course named as regimen or protocol. It is repeated after certain days, usually every three weeks or two, often termed as cycle. Each cycle can last single day or more than that. Many regimens are abbreviated as acronyms. Eg CHOP (Cyclophosphamide (C), Doxorubicin (H), Vincristine (O) and Prednisolone (P).)

Optimal dose of chemotherapy is a must. Suboptimal dose cannot kill cancer cells while overdose can produce excessive toxicities. Care should be taken to calculate and prepare the dose properly.

Chemotherapy drugs can be classified according to the local damage

Category	Effect	Example
vesicant	produce a blister and/or tissue destruction if extravasated	Daunorubicin, Vinblastin, Vincristine, Mitomycin, and Epirubicin
Irritant	produce venous pain at the site of and along the vein with or without an inflammatory reaction	Dacarbazine, Etoposide, and Ifosamide

Common side effects of chemotherapy

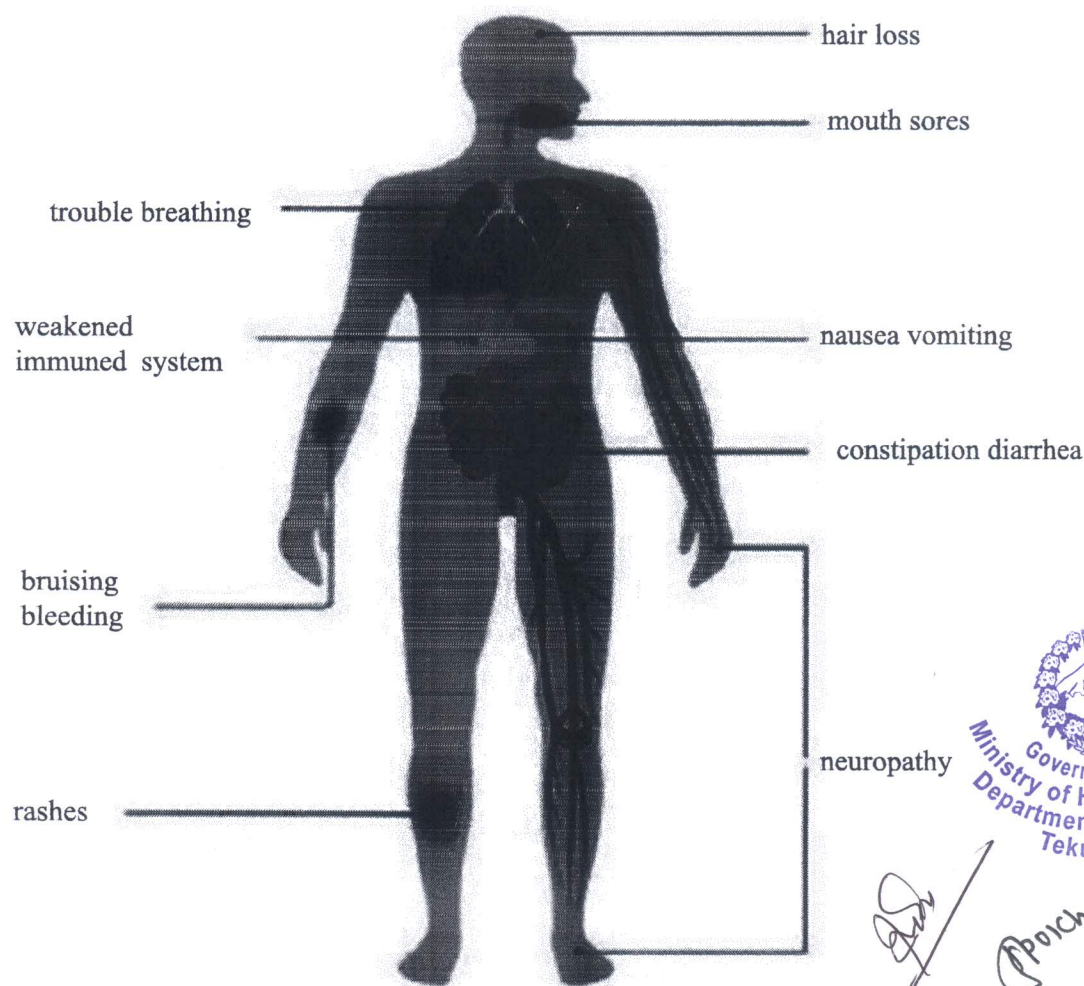


Figure No. 1 : Common Side Effects of Chemotherapy

Common Side Effects of Chemotherapeutic Agents

S.N	Common side effects of chemotherapy drugs		
1.	Vincristine	Peripheral Neuropathy (ptosis, jaw pain, paralytic ileus) Extravasation of drug	Check for backflow to prevent extravasation
2.	Cyclophosphamide	Hemorrhagic Cystitis	mesna to be used in higher doses
3.	Anthracyclines	Cardiac toxicity	Echo prior to chemotherapy
4.	Carboplatin	Nephrotoxicity	
5.	Cisplatin	Ototoxicity Nephrotoxicity	Hearing assessment prior to chemotherapy
6.	Cytarabine	Keratitis	Use prednisolone eye drops in high doses
7.	Methotrexate	Renal dysfunction Liver dysfunction Bone marrow suppression	Use folinic acid rescue in high doses Adjust doses in low counts
8.	Actinomycin	Allergic reactions	Avoid in conjunction to radiotherapy
9.	L-asparaginase	Pancreatitis Thromboembolism	
10.	Paclitaxel		
11.	6-Mercaptopurine	Liver dysfunction Bone marrow suppression	Adjust doses in low counts
12.	Irinotecan	Diarrhea	Use Cefixime prophylactically
13.	Bleomycin	Pulmonary fibrosis	Pulmonary function test prior to chemotherapy

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- Kidney problems
- Mood change, chemobran which can effect concernation focus.

Safety precautions

i General safety precautions

- Plastic face should or splash google should be used.
- Use respirator N95 mask during Chemotherapy Perparation.
- Trained health care professionals must be involved in chemotherapy preparation and administration and should follow the protocol.
- Trained health professionals should practice personal protective equipment (PPE) during preparation, administration and disposal of drug for safe handling.
- Trained health professionals should maintain proper aseptic techniques.
- Surgical latex gloves should be used as they are less permeable to many chemotherapeutic drugs. A double layer of gloves is substantially less permeable and should be used if double gloving does not interfere with technique.
- Gown with long sleeves and elastic or knit-closed cuffs should be worn, with the cuffs tucked under the gloves.
- A plastic face shield or splash goggles should be used. Surgical masks do not protect against the breathing of aerosols.

ii Chemotherapy preparation precautions

- It should be prepared in Bio Safety Cabinet (BSC) on a disposable, plastic-backed paper liner.
- Syringes and IV sets with fittings should always be used.
- Syringes should always be large enough so that they should not be more than three-fourths full.
- Plastic-backed paper liner should be changed after preparation is completed.

iii BSC care precautions

- Rubber sheet, cloth liner BSCM plastic-backed paper liner should be changed daily.
- Hand hygiene should be performed after removing gloves
- BSC should be cleaned at least twice daily with sterile gauze pad with 1.10 sodium hypochlorite on base, ceiling, front and back of interior surfaces.
- Ten minutes time should be purged to allow surface contact with sodium hypochlorite.
- BSC should be wiped with decontaminating agent to disinfect, then 70% alcohol should be gently spread on all work surfaces of cabinet and allow fully air dry.
- Fifteen minutes time should be purged after decontamination.
- Rubber sheet & cloth linen of BSC should be changed daily.
- Hand hygiene should be performed after removing gloves.
- A non-splash disposal collection vessel such as a plastic or metal tray lined with sterile gauze pads should be at hand to collect excess solution.
- Chemotherapy drug prepared in BSC should be transported to correct patient in puncture proof container.

Prithvi



iv Patient assessment

- Height, weight and surface area should be measured before start of chemotherapy.
- Performance status, vital signs should be measured before each cycle.
- Allergies and previous treatment-related reactions should be assessed before each cycle.

v Cytotoxic waste precautions

- Cytotoxic drugs should be transported, administered and disposed by individuals who have received appropriated training and fellow HCWM (Health Care Waste Management)
- Cytotoxic drug transport containers should not be used by patient for domestic purpose.

Basic set up

preparation Area	Preparation person	Administration Person	Waste management
Only in BSC	Trained Health care professionals	Trained Health professionals	Cleaner (Cytotoxic waste management committee)



Chemotherapy Preparation & Administration

Checklist of Chemotherapy Preparation : Before preparation of chemotherapy

1. Verify following elements of chemotherapy order

Name of patient:

IP no:

Ward :

Bed No:

Diagnosis

Chemotherapy regimen

Date :

Check By:

SN	Items	Yes	No
1	Date of order		
2	Name of drug / regimen /protocol		
3	Dose of drug		
4	Proper storage of drugs.		
5	Expiry date of drug		
6	Cycle number and day		
7	Patient's informed consent		
8	Ensure infusion volume and proper dilution		
9	Route, rate and duration of administration		
10	Read drug preparation and dilution instructions (by oncologist / manufactures guideline)		
11	Prepare bio safety cabinet (BSC) as described in safety precautions section		
12	Keep equipment ready for chemotherapy preparation as in table 1.		

BP:

Temperature:

Respiration:

Pulse:

Name and signature of staff:

Chemotherapy Preparation & Administration

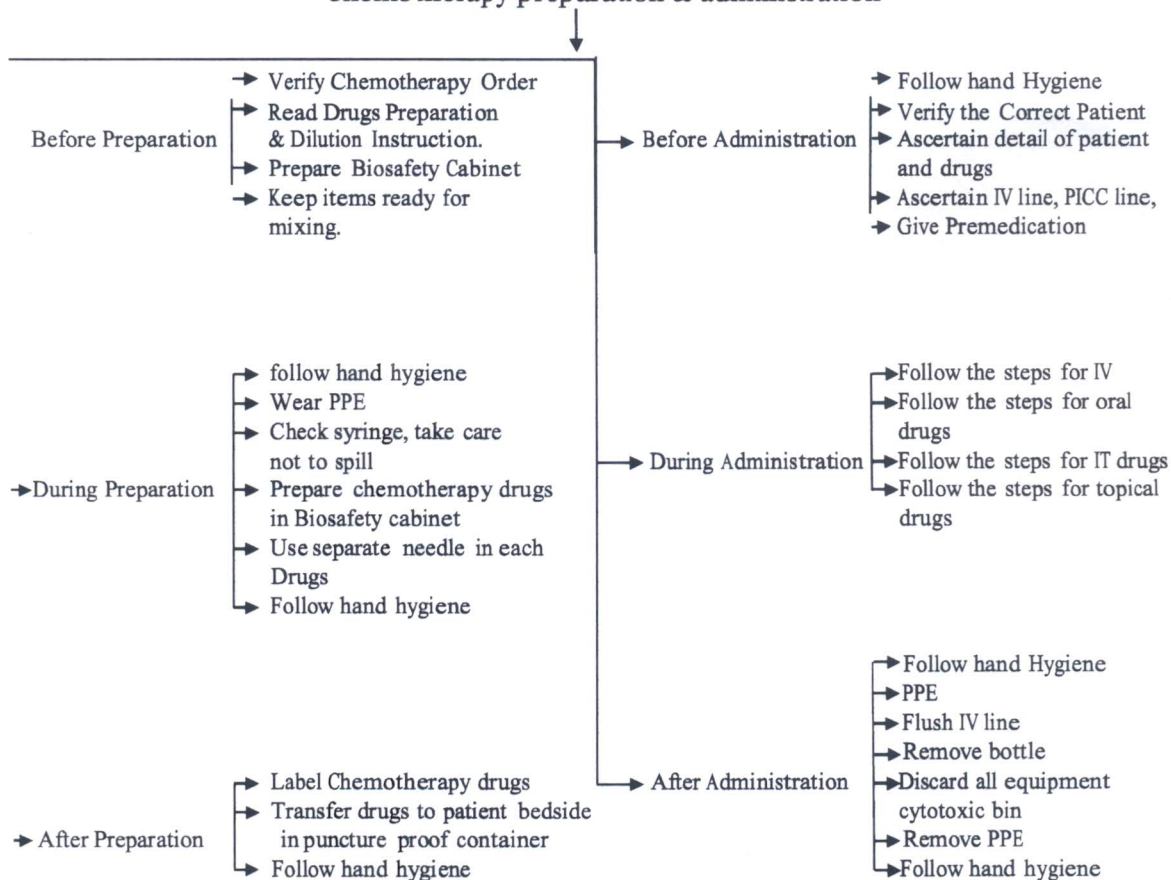


Table 1

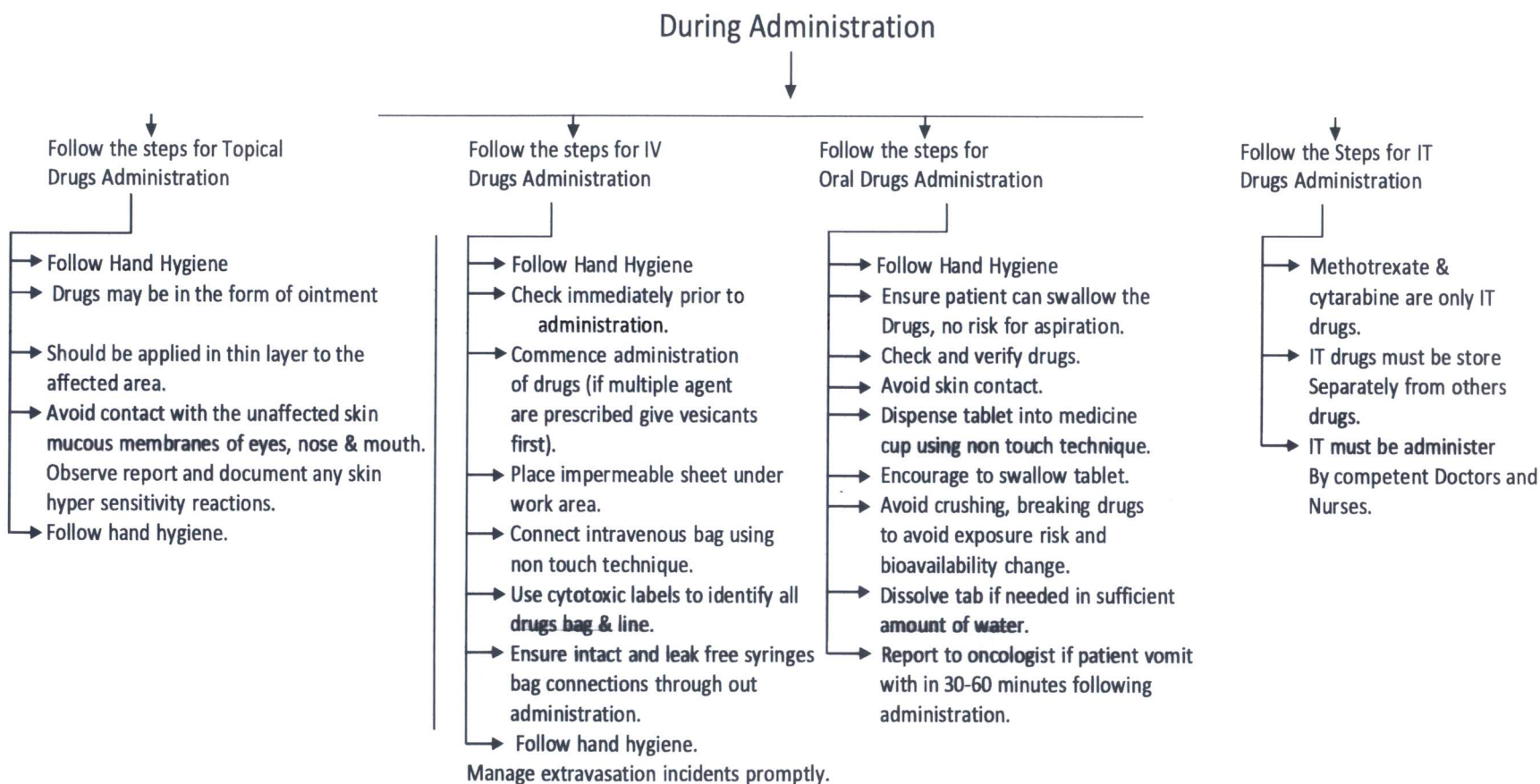
Equipment Required

- Clean tray padded with disposable absorbent towel or gauze pads
- Extra gauze pads
- Sterile water
- Large gauze free needle
- Syringes
- Chemotherapy drugs and solvent/diluents
- Infusion fluid
- Permanent marker
- Ampoule cutter
- Personal protective items (long sleeves gown, goggles, mask, closed shoes, gloves)

Chemotherapy preparation & administration



Flow Chart No.1 : Steps to be Followed for Chemotherapy Preparation and Administration



Flow chart No.2 : Steps to be followed for Chemotherapy Administration

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Table : 2 Checklist of chemotherapy preparation

During preparation of chemotherapy	Yes	No
<ol style="list-style-type: none"> 1. Wash hands before handling. Use aseptic technique. 2. Wear personal protective items with double gloves. 3. Prepare chemotherapy in isolated room under protected and well ventilated BSC. 4. Take care not to spill any drug outside. Push syringe piston with capped needle only. 5. Select syringes large enough so that they are never more than 75% full syringe. 6. Use separate needle for each drug. 7. Change gloves every 30 minutes or in case of spill. 		
After preparation of chemotherapy	Yes	No
<ol style="list-style-type: none"> 1. Label each chemotherapy drug with clearly visible standard label after mixing. (drug name, duration of administration, name / identification / bed number of patient.) 2. Transfer the drug to patient's bed side safely. (Puncture proof container) 		

Table : 3 Checklist for chemotherapy administration

Before administration of chemotherapy	Yes	No
<ol style="list-style-type: none"> 1. Verify the correct patient. 2. Educate the patient about chemotherapeutic agent. 3. Put on personal protective items including double gloves. 4. Ascertain details (name, dose, route, rate and duration of administration) of the drug. 5. Ascertain the intravenous site for intravenous drug, either peripheral or central (PICC or chemo port). 6. For peripheral site, choose veins of normal circulatory dynamics and reasonable diameter to limit high concentrations and possibility of extravasations. 7. Select infusion site in following order of preference: dorsum of hand> wrist> forearm> ante cubital fossa. Insert cannula with only venipuncture into vein and secure it. 8. Test vein integrity/patency by obtaining blood backflow and/or flash cannula with NS. Select next site if obvious NS extravasations; i.e. other arm, or lateral or proximal to initial site. Avoid distal point on same vein because of potential for extravasation. 9. Premedicate 30-60 minutes before chemotherapy or as ordered. 		
During administration of chemotherapy	Yes	No
<ol style="list-style-type: none"> 1. Monitor vital signs. 2. Document date and time of administration. 3. Monitor, report and document any drug Allergies. (Puncture proof container) 		

1. Follow the steps for IV drug administration	Yes	No
<ul style="list-style-type: none"> • Check drug immediately prior to administration. • Commence administration of drug (if multiple agents are prescribed, give vesicants first). • Place impermeable sheet under work area to contain any minor pills. • Connect intravenous bags above waist level using non touch technique. • Use cytotoxic labels to identify all intravenous bags, infusion syringes & lines contaminated with cytotoxic agents. • Ensure intact and leak free syringes/bag connections throughout administration. • Manage extravasation incidents promptly. 		
2. Follow the steps for oral drug administration	Yes	No
<ul style="list-style-type: none"> • Ensure patient can swallow the drug and there are no risk factors for aspiration. • Check oral drug prior to administration. • Handle tablets in manner to avoid skin contact and liberation of powdered drug into air. • Dispense tablets cap into medicine cup using non touch technique or gloves. • Encourage to swallow tablets. • Avoid crushing and breaking drug to avoid exposure risks and bioavailability change. • Dissolve tablet cap if needed in sufficient amount of water (remove plunger from syringe, place tablet into syringe, add 2-3ml of water, cap syringe while dissolving). • Report to oncologist if patient vomits within 30 – 60 minutes following administration, to determine whether dose must be repeated. 		
3. Follow the steps for Intrathecal (IT) administration	Yes	No
<ul style="list-style-type: none"> • Methotrexate and Cytarabine (Ara-c) are only IT drugs. • IT drugs must be administered by competent nurse. • IT drugs must be stored separately from other drugs. 		
4. Follow the steps for topical drugs administration	Yes	No
<ul style="list-style-type: none"> • The drug may be in the form of an ointment, solution or suspension. • The drug should be applied in thin layer to the affected area with 		
Uses of an applicator: <ul style="list-style-type: none"> • Avoid contact with the unaffected skin, the mucous membranes of eyes, nose & mouth. • Observe, report and document any skin hypersensitivity reactions. • It drugs must be administered by competent Nurse and Doctor 		
After administration of chemotherapy	Yes	No
<ol style="list-style-type: none"> 1. Put on PPE including double gloves. 2. Remove bag/ bottle above waist level using disposable gauze and non-touch technique. 3. Flush IV line with compatible IV solution before removing it. 4. Use disposable gauze around IV site to remove cannula/needle. 5. Discard all equipment (bag, IV line, infusion syringe) into cytotoxic waste container. 6. Remove and discard personal protective items into cytotoxic waste container. 7. Wash hands with soap and water 		

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Extravasation Management

Extravasation is the accidental infiltration of chemotherapy drug from the vein into the surrounding tissue(subcutaneous tissue)at the IV site. Injuries that may occur as a result of extravasation include sloughing of tissue, infection, pain and loss of mobility of the limb. The amount of damage directly correlates with the amount of drug infused. Damage can continue for several weeks after the extravasation and in severe cases can lead to loss of function or amputation.

A vesicant is a drug that can produce a blister and/or tissue destruction if extravasated. Examples include Daunorubicin, Vinblastine, Vincristine, Mitomycin, and Epirubicin. An Irritant is a drug that can produce venous pain at the site of and along the vein with or without an inflammatory reaction. It can cause itching, aching, tightness and phlebitis. Common irritant drugs include Dacarbazine, Etoposide, and Ifosamide.

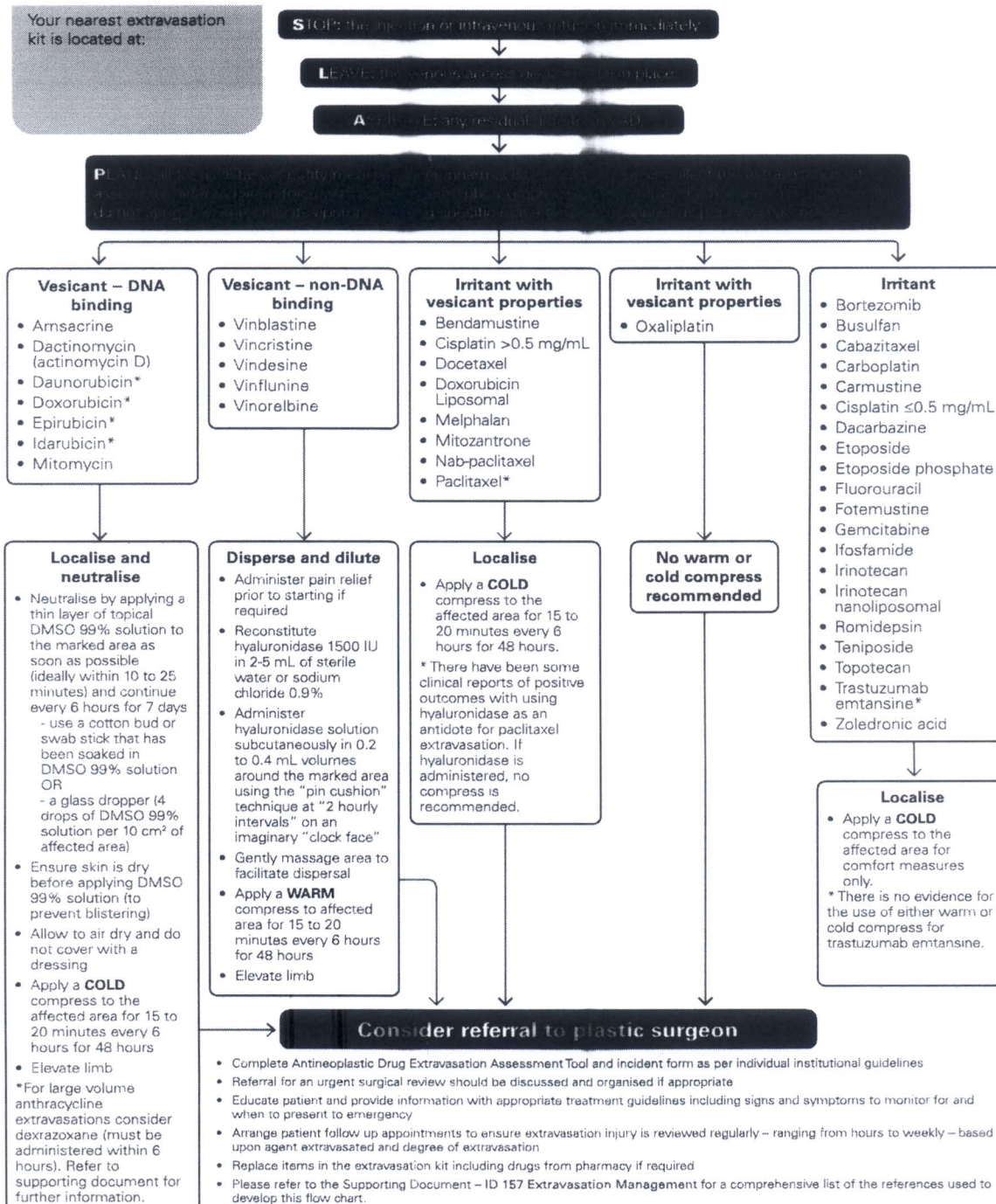
Immediate management of Extravasation.

- Stop IV infusion but leave cannula in place.
- Get extravasation kit.
- Explain the situation and procedure to the patient.
- Prepare the antidotes/steroid.
- Mark the extravasation site with a pen and take photograph.
- Connect 10ml syringe and withdraw drug and blood as much as possible.
- Subcutaneous injection of NS may help to dilute the drug.
- No warm & cold compress for Oxaliplatin.
- Apply cold compress for all drugs except Vinca alkaloids for 20- 30 minutes every 2-4 hours.
- Apply warm compress for Vinca alkaloids.
- Instruct the patient to rest and elevate the site for 48 hours.
- Accurately document the extravasation incident.
- Observe the site regularly for pain, erythema, swelling, induration and necrosis.
- Follow the extravasation management flow chart.

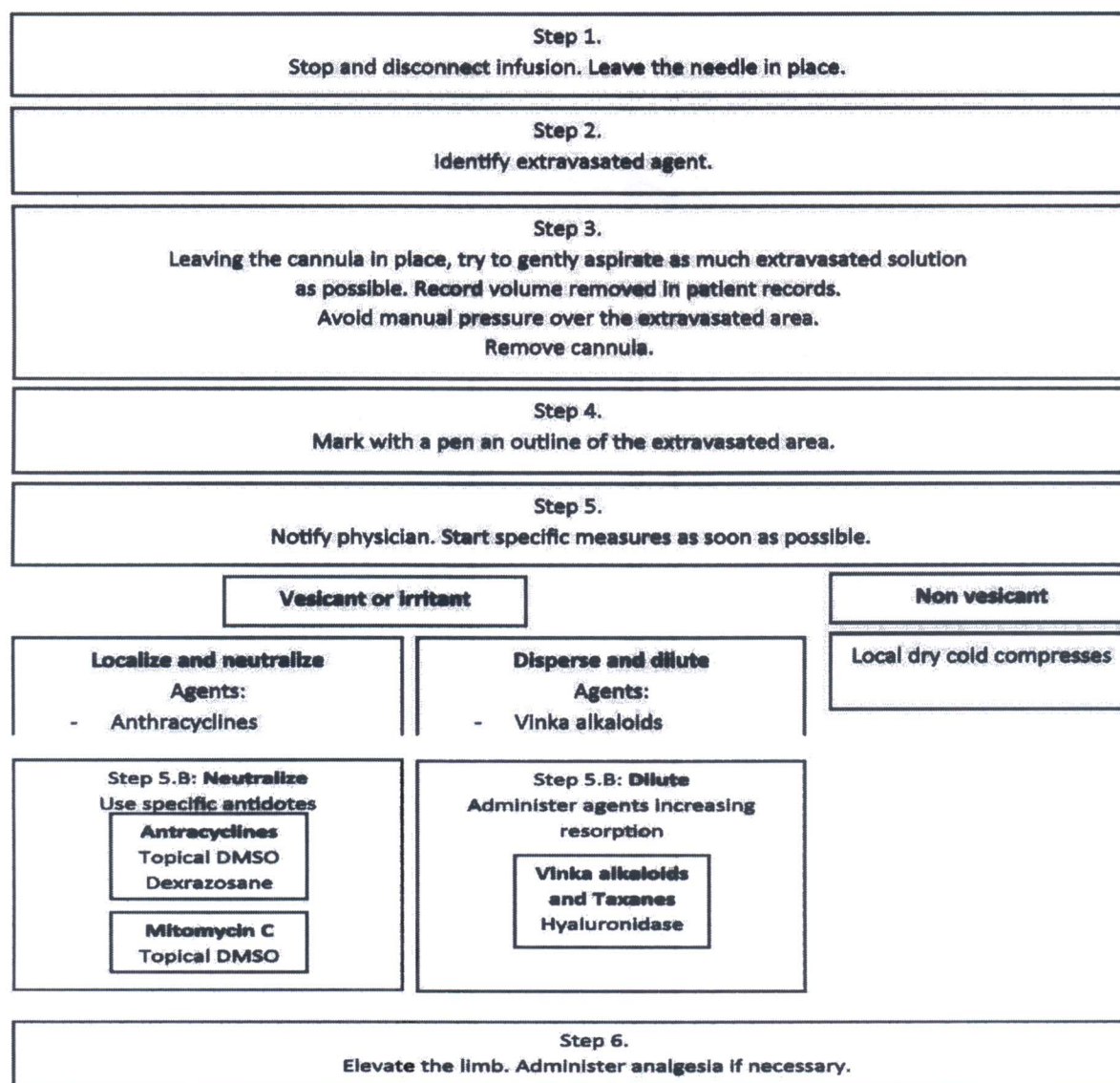
P. P. Chaudhary



Immediate Management of an Extravasation



Source : Cancer.nsw.gov.au



Flow Chart No.3 : Management of Extravasation

Prevention of Extravasation

Nursing responsibilities for the prevention of extravasation include the following

- Know the drugs with vesicant potential
- Identify risk factors e.g. multiple veinpuncture
- Anticipate extravasation and know management protocol
- Have central venous access for 24 hours vesicants infusion if possible.
- Test vein patency with. 0.9% NS 10 ml
- Provide adequate drug dilution as instructed.
- Close and continues monitoring on IV site.
- Ensure blood return from IV site before, during and after vesicant drug infusions
- Educate patient regarding symptoms of drugs infiltration, e.g. pain, burning, stinging sensation at IV site

Cytotoxic Spill Management

Chemotherapy drugs can cause mutagenesis, teratogens, carcinogenesis, and sterility when administered to humans; the risk varies with the specific drug and its concentration, and with the frequency and duration of exposure. Studies have found that through occupational exposure to antineoplastic drugs, healthcare providers are at risk for harmful effects. Chemotherapeutic spills should not be taken as other medicine spills; Spilled of chemotherapeutic agents should be clean up immediately by taking special precaution regardless of its amount. Trained staff should do spill management. All workplaces should have written policy that cover the important points around spill management. Even a small-volume spill should be considered a source of exposure and handled appropriately. The longer the delay in cleaning a spill, the lower the cleaning effectiveness, so the quicker a spill is cleaned, the more effective the decontamination process will be. Only personnel who are properly trained in spill management and the use of PPE should be handling spill management. Personnel who are potentially exposed during the spill or spill clean up or who have direct skin or eye contact with HD require immediate evaluation. Non-employees exposed to an (Hazardous Drugs) HD spill should follow institutional policy, which may include reporting to the designated emergency service for initial evaluation and completion of an incident report or exposure form.

Large Spills: A large spill is defined as any incident resulting in a chemotherapy spill of quantities more than 500ml.

Small Spills: A small spill is defined as any incident resulting in a chemotherapy spill of quantities less than or equaling 500ml.

Equipment of Chemo spill Management kit

- Personal protective equipment
 - 1 Gown
 - 1 Dust & mist respirator mask
 - 2 Pair Gloves
- Surgical gloves
- Utility
 - 1 Pair plastic eyeglasses with side shields
 - 1 Pair boot
- Warning sign board
- Sodium hypo chloride
- Distilled water
- Scoop and scraper
- Puncture proof container
- Absorbable towel \clothes 10 pieces
- Hazardous waste label
- Large heavy waste disposal bags-2 pieces
- Metal wash bowls-2 pieces

- Detergent 1 pack
- 250 ml and 1 liter spill control pillows-1 piece

Management of spill on hard surface

- Assess the exposure of any individuals involved or not.
- Alert staff in the immediate, area that a spillage has occurred.
- Do not leave the spillage unattended.
- Evacuate area of all non-essential personnel e.g. patients (if appropriate), all visitors and all other staff who are not involved in dealing with the spillage.
- Put "DANGER – CYTOTOXIC SPILLAGE" sign at entrance areas and alert everyone not to enter the clinic area.
- Obtain drug spill kit.
- Put on personal protective equipment in the following order: mask, goggles, gown with long sleeves, 2 pairs of gloves and gum boot
- Open waste disposal bag
- Place absorbent towel gently on the spill area, being careful not to touch it, moving from outside to inside until it becomes dry.
- If the spill is more than 500 ml, place the spill pillow in the center of the spill (one pillow can absorb up to one liter of liquid)
- Place the saturated absorbent towel in waste bag
- Place two liters of detergent solution. Clean surface with absorbent towels using detergent solution and rinse and clean with tap water. Wipe and dry it thoroughly.
- Clean the spill area thoroughly, from least contaminated to most contaminated areas, using a detergent solution followed by clean water.
- Collect broken glass and fragment in a puncture proof container by using scraper and scoop.
- Place all contaminated materials (gown, mask, gloves, saturated pad and towel) in double bagged waste disposal bags
- Discard waste bag and content in approved container
- Carefully discard the detergent solution into the drain or toilet without splashing
- After handling and disposal, remove the outer gloves, turning them carefully inside out to avoid touching the outside.
- Remove the gown, not pulling it over the head, to avoid transfer of contamination to clothes and skin. Turn the gown inside out and fold it tightly and discard it.
- Next, remove the inner gloves and discard in the disposal container, then wash hands with soap and water.
- The final step in removal of PPE, after hand washing, is removal of the respirator/mask, avoiding touching the facepiece. Wash hands again if contaminated during removal of the respirator.
- Wash hand thoroughly with soap and water
- Notify housekeeping for ordinary cleaning
- Document in nursing notes.

Management of spill on linen

- Restrict area of spill and identified with a warning sign
- Obtain drug spill kit.
- Obtain specially marked, approved laundry bag
- Put on personal protective equipment like gown, boot, mask, goggles, and gloves

- Removed solid contaminated linen from the patient's bed side
- Place linen in approved, specially marked, and impervious laundry bag
- Send the contaminated linen bag in a laundry with warning mark
- Wash the contaminated linen in two times in the laundry.
- Clean contaminated area with absorbent towel and detergent solution.
- Place all contaminated materials (gown, mask, gloves , saturated pad and towel) in double bagged waste disposal bags
- Wash hand thoroughly with soap and water

Management if the clothing is contaminated

- Remove yourself from the source of contamination.
- All items of contaminated clothing must be removed as soon as possible.
- Sponging the affected items is not sufficient for decontamination.
- Clothing that has only minimal contamination should be washed as per contaminated linen. (Place in dissolvable infected linen bag and wash 3 times at the maximum temperature for that clothing – if unknown, wash at 40°C).
- Clothing with a large amount of contamination must be disposed of as contaminated/ cytotoxic waste in a cytotoxic sharps bin.

Management of spill on personnel

- Isolate the person and identified with a warning sign
- Obtain drug spill kit.
- Immediately remove gloves or gown and any contaminated clothing and dispose of in purple cytotoxic waste container
- Wash affected area of skin with clean water than soap and water and proceed of shower
- Follow procedure of contaminated linen
- Follow up after 6 month

Eye exposure

Immediately flush affected eye with water for at least 15 minutes and obtain medical attention promptly

Documentation

Document the name of drug and volume of spill

Document how the spill occurred

Document the Spill management procedure you followed

Record Personnel, patients and others exposed to the spill

Notification to hospital authorities about spill

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Cytotoxic Waste Management

Cytotoxic waste includes any residual cytotoxic agent that remains following patient treatment and any materials or equipment potentially contaminated with cytotoxic agents. These include –

- Contaminated waste from preparation processes
- Sharps and syringes, ampoules and vials Intravenous infusion sets and containers Empty cytotoxic drug bottles
- Cotton wool from bottles containing cytotoxic drug
- Used HEPA filters and other disposable contaminated equipment
- Contaminated PPE (e.g. Gloves, disposable gowns, shoe covers)
- Swabs, cloths, mats and other materials used to clean cytotoxic contaminated equipment or to contain spills

Waste anagement committee

Hospital waste management must involve representative of oncology department staff

Principles of cytotoxic waste management

- Designate a person to be responsible for ensuring an efficient waste disposal system.
- Have a clear statement of the chain of responsibility and involvement of all levels in policy development and implementation.
- Develop and implement policy and system to avoid/minimize waste at point of generation
- Cytotoxic waste should be segregated from other waste
- Cytotoxic waste should not be disposed in infectious biomedical waste.
- Appropriate cytotoxic waste container should be placed in all areas where cytotoxic drugs are handled
- The lids of cytotoxic drug containers must remain closed, except when depositing waste.
- Bins with foot pedals and lids, which lock automatically when full, should be used to minimize exposure.
- Cytotoxic waste containers should be transport properly
- Workers who handle cytotoxic waste containers should use PPE
- Workers who handle the biologic fluids, excreta, contaminated bedding, and soiled equipment of patients receiving cytotoxic drugs should use PPE
- Sharps cytotoxic waste must be transported in a puncture-resistant and leak-proof container with
- Cytotoxic waste containers should not be overfilled.
- Cytotoxic waste containers should be secured to prevent movement during transport.
- The final storage areas for cytotoxic waste containers should be secure.

Porchalei



Disposal cytotoxic waste

- Sharps contaminated cytotoxic agents should be disposed of in rigid container with a leak-proof lid in cytotoxic containers.
- Disposable equipment contaminated with cytotoxic agents should be disposed of in cytotoxic waste buckets.
- Non disposable equipment should be washed with copious amounts of hot soapy water.
- Unused cytotoxic agents must be returned intact to pharmacy for disposal.
- Unused portions of cytotoxic agents should be disposed of in purple cytotoxic waste buckets.
- Contaminated hospital linen should be placed in alginate bag at the point of contamination. They must remain separate from other items of clothing.
- They should be washed twice using detergent and hot water and rinsed well

Waste Minimization

Completely eliminate unused material.

- Less generate waste.
- During dressing, cleaning and sterile procedures, practitioners should critically assess material required.
- Unwanted extra materials should be removed for re-sterilization or reuse.
- Review frequency of waste collection, size and location of containers and bags.
- Purchasing reductions: selection of supplies, which are less wasteful or less hazardous
- Use of physical rather than chemical cleaning methods (e.g. steam disinfection instead of chemical disinfection)
- Prevention of wastage of products, e.g. during procedure and cleaning activities

According to HCWMG Chemotherapy waste (including bulk cytotoxic agents) can be treated by chemical decomposition with :

- 5% sodium hypochlorite;
- Acid hydrolysis followed by alkaline hydrolysis;
- Reduction using zinc powder,
- Degradation using 30% hydrogen peroxide; and
- Destruction using heated alkali
- Needle prick injury

Training of cytotoxic waste handlers

The minimum training for cytotoxic waste handlers should include

- Information on the techniques and risks associated with the handling of the waste
- Procedures for dealing with spillages and other accidents
- Instructions on the use of PPE
- Hand hygiene training
- Needle Stick injury.

Technical Working Committee

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