

# Protocol for Preparation and Administration of Chemotherapy

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## Abstract

The patient and the health care personnel who are preparing and administering the chemotherapeutic drugs are at the risk of teratogenic, mutagenic and carcinogenic effect. The chemotherapy drug should be prepared by loading nurses who are trained specially in preparation and administration of chemotherapy. While preparing and administering the chemotherapeutic drugs, care must be taken to protect patients as well as the health care personnel.

**Keywords:** Chemotherapy, Protocol, Personal protective equipment, Biological safety cabinet

## Introduction

Chemotherapeutic drugs may not distinguish between normal and cancerous cells. The patient and the health care personnel who are preparing and administering the chemotherapeutic drugs are at the risk of teratogenic, mutagenic and carcinogenic effect. While preparing and administering the chemotherapeutic drugs, care must be taken to protect patients as well as the health care personnel.<sup>1</sup>

## Purpose

To ensure safety of the patient and the health care personnel in the process of preparation and administration of chemotherapy.

## General Instructions

### Work Area

- Drug preparation and loading should be done in a restricted, preferably centralized area.
- Class II biological safety cabinets should be used.
- Unauthorized personnel should not be allowed to enter into the area.

- Eating, drinking, smoking, chewing gum, storing food and applying cosmetic should be avoided.
- Cabinet should be cleaned according to manufacturer's instruction.

## Use of Personal Protective Equipments

### Gloves

- Use double, latex gloves with minimal or no powder. Powder absorbs contaminated particles.
- Change the glove every hourly or when it is torn, punctured or contaminated with spills.
- Use thicker, longer latex gloves that cover the gown cuff.

### Gown

- A protective disposable gown made of lint free, low permeability fabric with a closed front, long sleeve; elastic and knit closed cuff should be worn.
- Tuck the cuffs under the gloves
- If double glove in worn, the outer glove should be worn over the gown cuff and inner glove should be worn under the gown cuff.
- When the gown is removed, the inner glove should

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be removed last.

- Do not use the glove or gown outside the preparation area.

### Respiratory Protection

- Wear mask

### Eye and Face Protection

- Splashes, sprays or aerosols of chemotherapeutic drugs results in eye, nose or mouth contamination.
- Splash goggles can be used.
- Eye wash facilities should be available in the cabinet.

### Pre-preparation Procedure

- Check the height and weight of the patient and record it in the chart.
- Calculate the body surface area.
- Verify and document the absolute neutrophil count.
- Review and document the laboratory reports of the patient.
- Verify the duration between each cycle.
- Chemotherapy orders must be written clearly (name of the drug, dosage, diluents, route, duration of administration and premedication) with the doctor's signature and date.
- Protocol should be available and signed by the consultant.
- Oral or unclear orders should not be followed.

### Equipment Needed

- Patient's medication record & chart.
- Prescribed drug or drugs.
- Injection trolley with spirit, cotton ball jar, clamp bottle/cheatle forceps bottle, sharp container, sterillum, adhesive and scissors.
- Disposable syringes as needed.
- Protective devices (gloves – 2, mask, apron, shoe cover and goggles).
- Vertical laminal airflow/biological safety cabinet.
- Diluents for mixing chemotherapy drugs and IV fluid for dilution.
- Drug label.



Figure 1. Biological safety cabinet

### Preparation of Chemotherapy

The chemotherapy drug should be prepared by loading nurses who are trained specially in preparation and administration of chemotherapy. The assigned nurse for the particular patient also should be present throughout the preparation of cytotoxic drugs along with the loading nurse to counter check the drug, dosage, route and dilution.<sup>1</sup>

### Procedure

- Assemble the needed equipment in the chemotherapy loading area.
- Put on the UV light inside laminar hood 15mts before procedure.
- Put on the airflow.
- Clean the internal surface of the cabinet with 70% alcohol and a disposable towel.
- Cover the work surface with a clean plastic absorbent pad to minimize contamination by droplets or spills. Change the pad at the end of the shift or whenever a spill occurs.
- Verify the drug, dosage and route of administration by checking the medication record against the doctor's order.
- Keep the prepared labels beside the IV bottles and the specific chemotherapy drugs.
- Wash hands with soap and water or sterillum.
- Wear protective devices.



Figure 2. Personal Protective Equipments

- Open the glove paper and drop the spirit swab, syringes as needed on it.
- Check the IV fluids for expiry date, contamination and any precipitation.
- Remove the plastic cork of the IV fluid and wipe it with spirit swab.
- Open the drug away from the face and body. Use a suitable pad or cotton for breaking the ampule. In case of vials, clean the top of the vial with spirit swab in a circular motion. Discard the cotton swab.
- Introduce the diluents slowly in to the vial to prevent high pressure being generated inside the sealed vial.
- Withdraw the chemotherapy drug using the syringe

and expel the air without spillage of medications. When excess air is expelled from a filled syringe, it should be exhausted in to the vial and not straight into the atmosphere.

- Mix the drug with IV fluid kept ready for infusion.
- Keep sterile cotton on the loaded bottle and seal it with adhesive.
- Label the drug correctly and get the counter sign from the assigned nurse.
- Discard all the materials which have come into contact with the cytotoxic drugs (syringes, cotton, mask, apron, ampoules and vials) in a sealed black cover with adhesive.
- Discard the needle in the sharp container.
- Goggles, face shields, respiration are cleaned with mild detergents and are reused.
- Wash hands.

### Administration

- Wash hand with soap and water or sterilium.
- Wear protective devices.
- Check the doctor's order.
- Check the IV fluids for discoloration and any precipitation.
- Transport the drug carefully to the patient's bedside.
- Counter check the chemotherapy medicines in the bedside with assigned nurse.
- Pre-medicate the patient as per the doctor's order.
- Connect the drug to the right patient using all rights of medication administration.
- Monitor drops or ml per minute.
- Assess the vital signs while chemotherapy is on flow. Watch for any untoward reactions like nausea, vomiting, dyspnea, tachycardia, tachypnea, chest pain and allergic reaction.
- Monitor for proper flow and complete the infusion on time.

### Disposal

- After infusion is complete, wrap the IV set in a purple cover and dispose.
- Discard all the materials which have come into contact with the cytotoxic drugs (syringes, cotton, mask, apron, ampoules and vials) in a sealed black cover with adhesive.
- Discard the needle in the sharp container. Do not attempt any measures to break the needle. Breaking the needle causes spillage.
- Goggles, face shields, respiration are cleaned with mild detergents and are reused.
- Wash hands.

### Documentation

Document carefully and get the counter signature by the co-staff.

### Care of Spills

Emergency procedures to cover spills or unintentional release of hazardous drugs should be included the hospital overall health and safety program. Incidental spills and breakages should be cleaned up immediately by a properly protected person trained in the appropriate procedures. The area should be identified with a warning sign to limit access to the area. Incident reports should be filled to document the spill and those exposed.<sup>2</sup>

### Personnel Contamination

Contamination of protective equipment, clothing, a direct skin or eye contact should be treated by:

- Immediately removing the gloves or gowns.
- Immediately cleaning the affected skin with soap and water.
- In case of eye exposure, washing the eye with water or isotonic eye wash for 15 minutes.
- Obtaining medical attention.
- Documenting the exposure in the employee's medical record.

### Clean up of Small Spills

Spill less than 5 ml is considered as small spill. The 5ml volume of material should be used to categorize spills as large or small.

- Liquids should be wiped with absorbent gauze pads; solids should be wiped with wet absorbent gauze. The spill areas should be cleaned three times using a detergent solution followed by clean water.
- Any broken glass fragments should be picked up using a small scoop and placed in a sharp container.
- Glassware and scoops are treated as reusable items.

### Clean up of Large Spills

When a large spill occurs, the area should be isolated and aerosol generation should be avoided. If powder is involved, damp clothes or towels should be used.

- Protective devices including respirator should be used when there are small spills or any suspicion of airborne powder or aerosol will be generated.
- Chemical inactivation should be avoided in this setting.
- All contaminated surface should be thoroughly cleaned

three times with detergent and water.

- All contaminated absorbent sheets and other materials should be placed in the UD disposal bags.

### **Conclusion**

Safety and accuracy are nursing priorities. So, it is the responsibility of the nurse to protect herself and patient from adverse effect of chemotherapeutic drugs.

**Conflict of Interest:** None

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