Basics of Cancer Care Workshop

"Safe Handling of Cytotoxic Drug"

Nursing Division,

Ministry of Health, Malaysia

Learning Outcomes

By the end of this lesson, learners will be able to:

- Identify occupational health hazards and the risks associated with exposure.
- Demonstrate safe handling, preparation, waste-disposal procedures and relevant guidelines.



Cytotoxic Spillage

Cytotoxic - An agent or process to kill the cells.

Cytotoxic spillage is accidental release, leakage, or contamination caused by **cytotoxic drugs** or **chemotherapy agents** during preparation, transportation, administration, or disposal which may be in solid, liquid, powder or aerosol form. (Occupational Safety and Health Administration [OSHA], 2026).





KNOW YOUR EXPOSURE TO HAZARDOUS DRUGS

Potential Risks of Exposure



Absorption through skin

- Usually during handling of oral tablets or disposal of waste.
- Spillage during the administration.
- Contaminated used equipment.

Ingestion

- Contaminated food (no handwashing after handling the drug or exposed food in the preparation room).
- Contact with contaminated surfaces, contaminated PPE, drug vials, tubing, excreta/body fluids, and waste containers.

Inhalation

- Inhaled as a result of aerosolization of powder.

Injection

- Needle prick injury.

Potential Risk of Exposure

LOCAL EFFECTS	SYSTEMIC EFFECTS
❑ Direct contact with skin, eyes, and mucous membranes.	❑ It can be short-term or long-term systemic effects.
❑ It may cause dermatitis, pigmentation, inflammation of the mucosa membrane, blistering or allergic reaction.	❑ **Short term** – Headache, dizziness, nausea, rashes & skin discoloration.
	❑ **Long term** – Partial alopecia, chromosomal abnormalities, infertility & increased risk of cancer.

Safe Handling of Hazardous Drugs



Administration



Storage



Waste disposal

Safe Handling on Chemotherapeutic Drugs

Administration

- During administration, **nurses** should wear proper Specify task-based PPE: chemotherapy-tested gloves, protective gown, eye/face protection if splash risk, and respiratory protection if aerosol/powder risk, according to local policy.

- **Caregivers** or **families** should be advised to wear gloves when handling drug or patients' excreta/body fluids (urine, feces, vomit). Caregivers should follow local chemotherapy-at-home precautions. Many centres advise precautions for at least 48 hours, while some drugs/regimens may require longer; use local policy.



Safe Handling on Chemotherapeutic Drugs



Administration

Elastomeric Infusion Pump Care at Home

- Place the elastomeric infusion pump in the correct position according to device instructions.
- Always keep it in the provided carrying pouch/bag.
- If leakage occurs, stop handling the device, avoid direct contact, place it safely in the provided bag if instructed, and seek urgent hospital/oncology advice according to local protocol.
- Place out of reach of children.





Safe Handling on Chemotherapeutic Drugs

Storage

Drug storage at healthcare facilities

- Store at the temperature recommended by the manufacturer or pharmacy.
- The storage should be labelled as **HAZARDOUS** on the container/storage area and action should be taken if accidental exposure.
- Place a spill kit near the storage area.
- Store hazardous drugs in a clearly labelled area, away from food/drinks, and according to manufacturer temperature and light requirements.



Safe Handling on Chemotherapeutic Drugs

Storage

Drug storage at home

- Advise patients or caregivers to store hazardous drugs in a container that provides protection from puncture or breakage.
- Do not crush or split tablets unless specifically instructed; keep medicines in original labelled packaging; wash hands after handling; return unused medicines to the hospital/pharmacy.
- Place out of reach of children.



Safe Handling on Chemotherapeutic Drugs



Drug disposal

- All containers should be appropriately labelled as **HAZARDOUS.**
- All unused drugs or equipment are treated as hazardous and should be disposed according to the procedure and institution policies.
- Place all supplies used intact in a closable, leak-proof, puncture-proof container to prevent aerosolization, leaks and spills.
- Cytotoxic/hazardous waste should be disposed of according to local scheduled/clinical waste policy. If incinerated, this requires high-temperature incineration; WHO notes modern healthcare-waste incinerators operate at about 850–1100°C, not 100°C.

Management of Chemotherapy Drug Spillage

SPILLAGE KIT

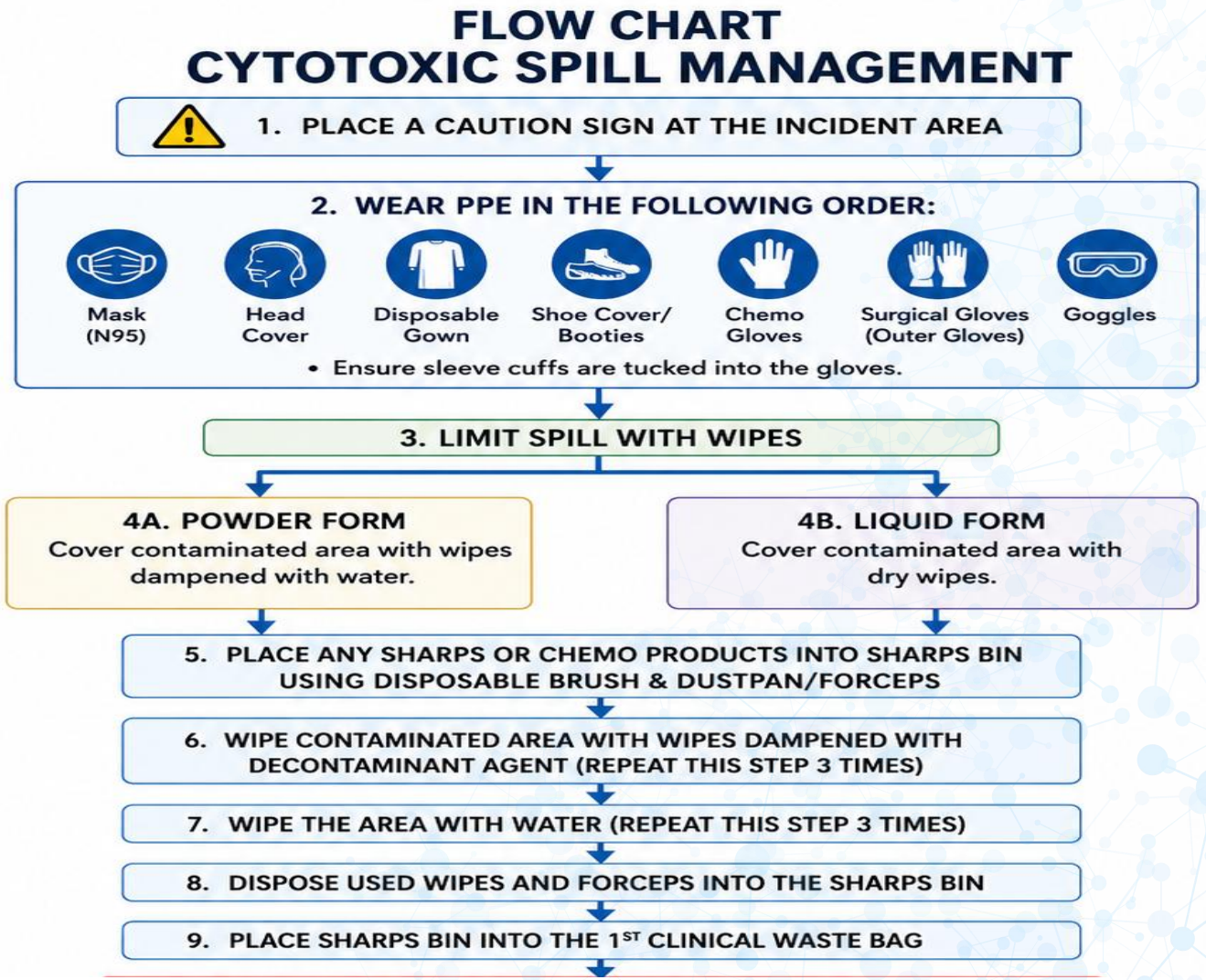




Management of Chemotherapy Drug Spillage

Cytotoxic spill management flowchart

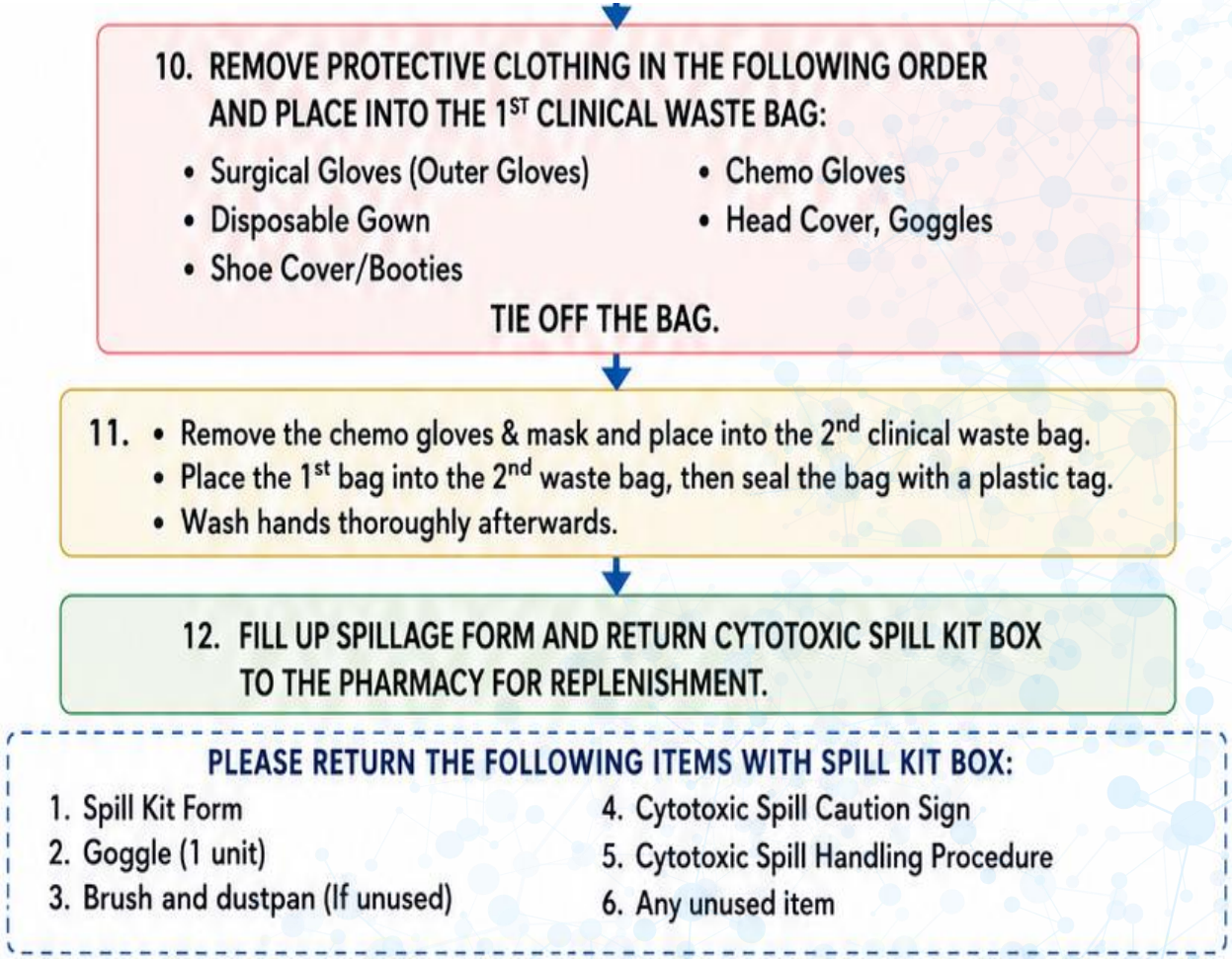
References from Manual for sterile preparation, MOH, 2nd edition 2023. Published by Program Perkhidmatan Farmasi.



Management of Chemotherapy Drug Spillage

Cytotoxic spill management flowchart

References from Manual for sterile preparation, MOH, 2nd edition 2023. Published by Program Perkhidmatan Farmasi.



Management of Chemotherapy Drug Spillage

IMMEDIATE ACTION BY HEALTH CARE WORKER

- The spill should be cleaned by trained healthcare workers wearing appropriate PPE.
- A spill must be marked with a warning sign to prevent other people from entering the contaminated area & other people from being contaminated.
- Spillage – liquids spills or powder spills.





Management of Chemotherapy Drug Spillage

Wear Personal Protective Equipment (PPE)



- Put on N95 mask
- Goggle
- Shoe cover
- Chemo gloves (inner)
- Chemo gown
- Surgical gloves (outer)

if indicated by spill type and local policy.

Management of Chemotherapy Drug Spillage

Liquid Spill

- Carefully place the **absorbent pad/gauze on top of the spillage** based on the size of the spill or place **sufficient quantity of gauze** over the spillage to absorb spilled liquid.
- After the liquid is absorbed, dispose of the absorbent material into the appropriate cytotoxic/hazardous waste bag according to local policy.
- Use gauze and plastic forceps **(DO NOT TOUCH DIRECTLY)** to absorb the rest of the spillage using :
  - Blotting motion.
  - Outside to inside.
  - Circular motion.
- Repeat using clean gauze (NOT THE CONTAMINATED GAUZE) until all spill is cleaned and throw into the clinical waste bag (yellow).



Management of Chemotherapy Drug Spillage

Powder spill

- To avoid aerosolization; use damp wipes/gauze according to local spill protocol.
- Carefully place **sufficient quantity of wet gauze** over the spillage to dissolve and absorb spilled powder.
- Clean the same way as the liquid spill in terms of direction and containment of spillage.



Management of Chemotherapy Drug Spillage

- Wipe the area with **Decon-90 (3 times)** then with **Water** (**3 times**) using gauze and the same plastic forceps.
- Wipe from the outside towards the centre using a circular motion to prevent spread.
- Dispose of contaminated items (forceps, gauzes and sharp bin) into yellow waste bag.



Management of Chemotherapy Drug Spillage

Remove PPE

- Surgical gloves (outer)
- Chemotherapy gown
- Shoe cover
- Head cover
- Goggle
- Dispose into clinical waste bag (yellow)



Management of Chemotherapy Drug Spillage

Disposal

- Tie clinical waste bag (yellow) & put into cytotoxic waste bag (purple).
- Remove and dispose of the N95 respirator and chemo gloves into cytotoxic waste bag (purple).
- Tie cytotoxic waste bag (purple) using a cable tie & place inside a dedicated clinical waste bin.
- Complete Cytotoxic spill report form and send to Cytotoxic Drug Reconstitution (CDR) Pharmacy.



Management of Chemotherapy Drug Spillage

- Return all remaining items in the spill kit, including reusable items such as goggles and the spill sign, to CDR Pharmacy.
- CDR pharmacy will replenish spill kit as soon as possible.
- Also complete the incident report form and document the incident in the nursing report.



Management of Chemotherapy Drug Spillage

Cytotoxic spill report form

CYTOTOXIC SPILL REPORT FORM

Please notify pharmacist _____(Name) at ext:5136/5137 if there is any cytotoxic spill. Fill up Spillage Form and return Cytotoxic Spill Kit Box to the pharmacy for replenishment on the day of incident.

Drug :	**Ward/Clinic :**
Date:	**Time of incident:**

Location of incident

☐ Patient area ☐ Nursing staff / area ☐ Other .....

☐ Corridor ☐ Pharmacy area

Description of incident

Name of the doer : _____

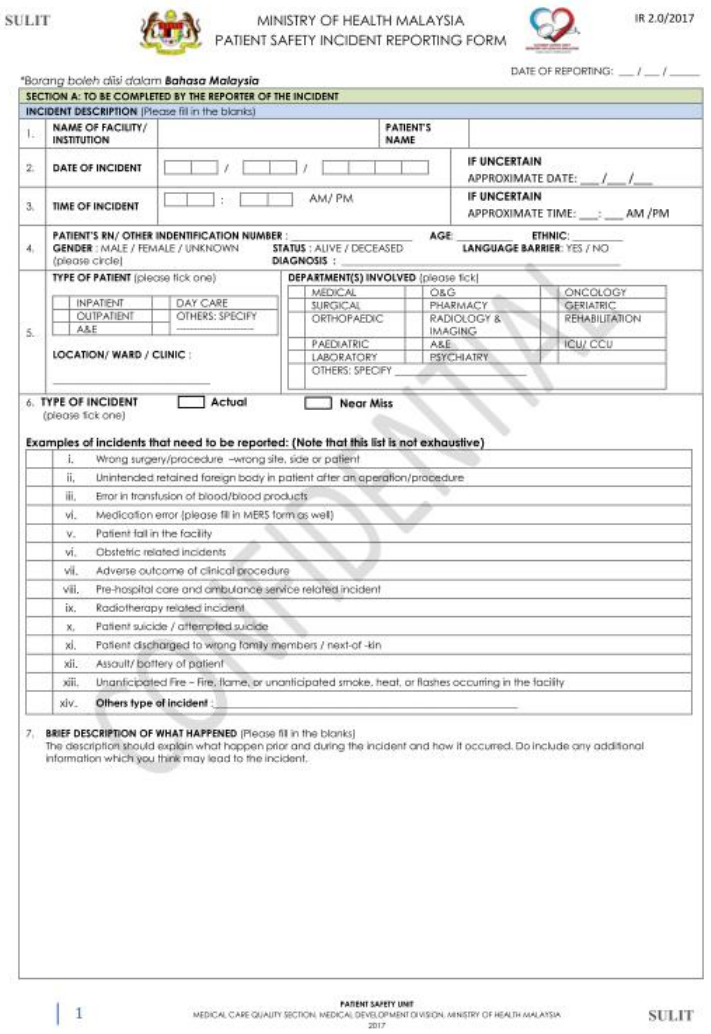
Name of the witness : _____

Reporting person : _____

Kit Returned **Date:** **Name:** **Signature:**	**Kit Replaced** **Date:** **Name:** **Signature:**

MANAGEMENT OF CHEMOTHERAPY DRUG SPILLAGE

Incident reporting form (IR 2.0)



SULIT

MINISTRY OF HEALTH MALAYSIA
PATIENT SAFETY INCIDENT REPORTING FORM

IR 2.0/2017

*Borang boleh diisi dalam **Bahasa Malaysia***

DATE OF REPORTING: ___ / ___ / _____

SECTION A: TO BE COMPLETED BY THE REPORTER OF THE INCIDENT

INCIDENT DESCRIPTION (Please fill in the blanks)

1. **NAME OF FACILITY/ INSTITUTION** | **PATIENT'S NAME**
2. **DATE OF INCIDENT** ___ / ___ / _____ — **IF UNCERTAIN** APPROXIMATE DATE: ___ / ___ / ___
3. **TIME OF INCIDENT** ___ : ___ AM/ PM — **IF UNCERTAIN** APPROXIMATE TIME: ___ : ___ AM /PM
4. **PATIENT'S RN/ OTHER INDENTIFICATION NUMBER** : **AGE**: **ETHNIC**:
   GENDER : MALE / FEMALE / UNKNOWN (please circle) **STATUS** : ALIVE / DECEASED **LANGUAGE BARRIER**: YES / NO
   DIAGNOSIS :
5. **TYPE OF PATIENT** (please tick one)

	INPATIENT		DAY CARE
	OUTPATIENT		OTHERS: SPECIFY
	A&E		

LOCATION/ WARD / CLINIC :

DEPARTMENT(S) INVOLVED (please tick)

	MEDICAL		O&G		ONCOLOGY
	SURGICAL		PHARMACY		GERIATRIC
	ORTHOPAEDIC		RADIOLOGY & IMAGING		REHABILITATION
	PAEDIATRIC		A&E		ICU/ CCU
	LABORATORY		PSYCHIATRY		
	OTHERS: SPECIFY				

6. **TYPE OF INCIDENT** (please tick one) ☐ **Actual** ☐ **Near Miss**

Examples of incidents that need to be reported: (Note that this list is not exhaustive)

	i.	Wrong surgery/procedure –wrong site, side or patient
	ii.	Unintended retained foreign body in patient after an operation/procedure
	iii.	Error in transfusion of blood/blood products
	vi.	Medication error (please fill in MERS form as well)
	v.	Patient fall in the facility
	vi.	Obstetric related incidents
	vii.	Adverse outcome of clinical procedure
	viii.	Pre-hospital care and ambulance service related incident
	ix.	Radiotherapy related incident
	x.	Patient suicide / attempted suicide
	xi.	Patient discharged to wrong family members / next-of -kin
	xii.	Assault/ battery of patient
	xiii.	Unanticipated Fire – Fire, flame, or unanticipated smoke, heat, or flashes occurring in the facility
	xiv.	**Others type of incident** :

7. **BRIEF DESCRIPTION OF WHAT HAPPENED** (Please fill in the blanks)
The description should explain what happen prior and during the incident and how it occurred. Do include any additional information which you think may lead to the incident.

CONFIDENTIAL

PATIENT OUTCOME (please tick one) **& IMMEDIATE ACTION – ONLY FOR ACTUAL INCIDENT**

8. **OUTCOME OF INCIDENT**

	NONE
	MILD
	MODERATE
	SEVERE
	DEATH
	CURRENTLY CANNOT BE DETERMINED

9. **IMMEDIATE ACTION FOLLOWING INCIDENT**

REPORTED BY

10. **DESIGNATION:** (please tick one)

	NURSE		SPECIALIST
	HOUSE OFFICER		PHARMACIST
	MEDICAL OFFICER		OTHERS:

SIGNATURE OF REPORTER:

NAME:
DATE:

Note: As part of good leadership and clinical governance, please inform the incident to your Head of Department(s) immediately.

SECTION B : TO BE COMPLETED BY THE RISK MANAGER/ QUALITY MANAGER OF HOSPITAL

1. **ACTION TAKEN:**

Mandatory Root Cause Analysis:
1) Incident with Severe or Death outcome
2) Other incident/near miss based on the Risk Manager/ Quality Manager assessment
3) Directive from State Health Department / Ministry.

(Please tick)

	"PRESCRIPTION SLIP"
	MONITOR THE TREND FIRST
	RCA
	MIRCA (Multi-incident Root Cause Analysis)

Additional comments :

2. **e-IR SUBMITTED?**

Please submit to e-IR **within 5 days** from the date of the incident.

Date of Submission: _____-_____-_____

3. **RISK MANAGER/ QUALITY MANAGER OF HOSPITAL**

(please fill in the blanks)

NAME:
SIGNATURE:

DESIGNATION:
DATE:

Management of Chemotherapy Drug Spillage

Procedures when contact with cytotoxic spills

- **Skin** :
  - Wash and flush thoroughly under running water 10 – 15 mins, then use soap and water, rinse.
- **Mucosal** :
  - Rinse and flush thoroughly under running water 10 – 15 mins.
- **Eyes exposure**:
  Irrigate with NaCl 0.9% or running water (slow current).
- **Needle stick injury**:
  Wash under running water and do not squeeze aggressively or scrub wound.
- **Contaminated linen**:
  Place in purple waste bag and inform to vendor.



*Seek immediate medical advice & medical attention

References

1. Occupational Safety and Health Administration. (2026). *Hazardous Drugs – Controlling Occupational Exposure to Hazardous Drugs*. https://www.osha.gov/hazardous-drugs/controlling-occex?utm.com
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4. American Society of Health-System Pharmacists. (2018). *ASHP Guidelines on Handling Hazardous Drugs*.
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THANK YOU