

Role Of Pharmacists in cancer management & patient safety

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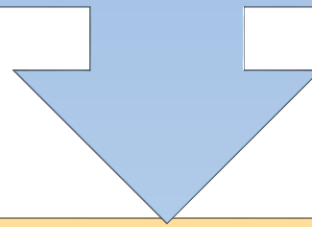
There are Different recommendations for best practices of safe use of chemotherapy and biotherapy agents and to assist practitioners in improving their medication-use systems to prevent medication errors and patient harm from these agents

- Recommendations for healthcare organizations
- Recommendations for multidisciplinary monitoring of medication use and verification
- Recommendations for prescribing systems and prescribers
- **Recommendations for medication preparation and dispensing systems and roles for pharmacists**
- Recommendations for medication administration systems and roles for nurses
- Recommendations for patient education
- Recommendations for manufacturers and regulatory agencies
- Recommendations for identifying and managing medication errors

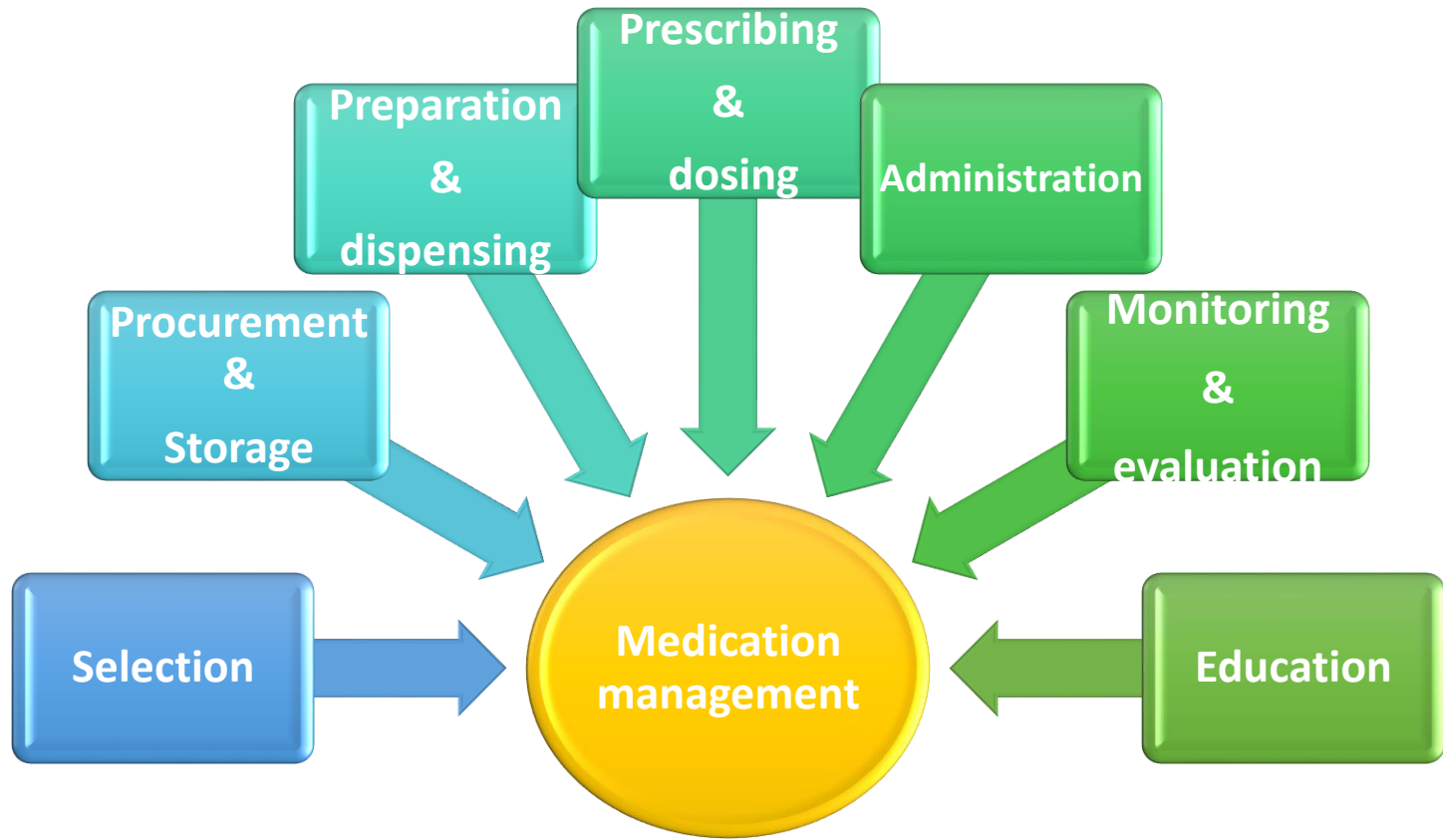
Introduction

- Pharmacists began training and defining their role in medical oncology practice in 1976.
- A curriculum was drafted for pharmacy students at the University of Tennessee in the US to contribute them in the therapeutic care of cancer patients.
- The basis of the curriculum emphasized on pharmacokinetics of drugs ,extensive training in pharmacology and medicinal chemistry.
- The American Society of Health-System Pharmacists (ASHP) published guidelines in 1990, 1993, 1996, and 2002 to describe pharmacist's role not only in safe handling, preparation, and dispensing of drugs but also in pharmaceutical care as the health professional.

Chemotherapy agents have Narrow therapeutic index
Complex dose calculations and adjustments
Complex, multidrug regimens in treatment of cancer



Multidisciplinary approach
Pharmacists' contribution to cancer treatment



Each of these processes helps to support optimal & safe anticancer drug treatment

Selection

- Selection is defined as an appropriate choice of a medication for a specific indication.
- Oncology pharmacist can provide medical information about antineoplastic pharmacology, dosing adjustments for organ dysfunction, and adverse-effect profiles.
- Perform admission medication histories that help to clarify the patient's tolerance of current and previous medications and chemotherapy.



Prescribing, dosing, and transcribing

- Prescribing chemotherapy regimens is complicated, with dosing calculations based upon body surface area (BSA) and varying administration on consecutive and nonconsecutive days.
- Mistakes in prescriptions can lead to significant medication error.
- General medication errors in hospitals generally range from 2% to 5%.
- Chemotherapy error rates have been reported at 3%–16%.
- Errors in ordering are most common, followed by administration and then dispensing.
- Standard chemotherapy order forms created by OPSs have been shown to minimize errors

Standard chemotherapy order forms

- Diagnosis
- Height
- Most recent weight
- BSA calculation
- Dosage (mg/m²)
- Final calculated dose
- Start date and time
- Day of therapy
- Solution diluent and volume
- Infusion rate (drips)
- Route (intravenous [IV] push or infusion)
- Duration of infusion
- Frequency of administration
- Total number of scheduled doses



		بسمه تعالی مجتمع بیمارستانی امام خمینی (ره) برگ دستورات شیمی درمانی پزشک PHYSICIAN'S CHEMOTHERAPY ORDER SHEET									
National ID.No. کد ملی:		Unit No: شماره پرونده:		Attending Physician: پزشک معالج:		Ward: بخش:		Name: نام:		Family Name: نام خانوادگی:	
Date of Admission: تاریخ پذیرش:		Room: اتاق:		Date of Birth: تاریخ تولد:		Father Name: نام پدر:		Date: تاریخ:		Time: ساعت:	
BSA:		دوره:		روزیم:		تاریخ:		مهر و امضاء پرستار Signature of Nurses		مهر و امضاء پزشک Signature of Physician	
قد:		وزن:		تشخیص:							
روز تزریق دارو		زمان انفوزیون		حجم حلال (ml)		نوع حلال		راه تجویز		دوز محاسبه شده (mg/d)	
نام دارو		دوز دارو (mg/m ² /d)		درصد تعدیل							

Prescribing, dosing, and transcribing

Pharmacists contribute significantly to the dosing portion of the prescribing process.

- Chemotherapy dosing in elderly and pediatric patients
- Chemotherapy dosing for both the underweight and overweight patient
- Dosing in presence of drug–drug interactions

Preparation and dispensing

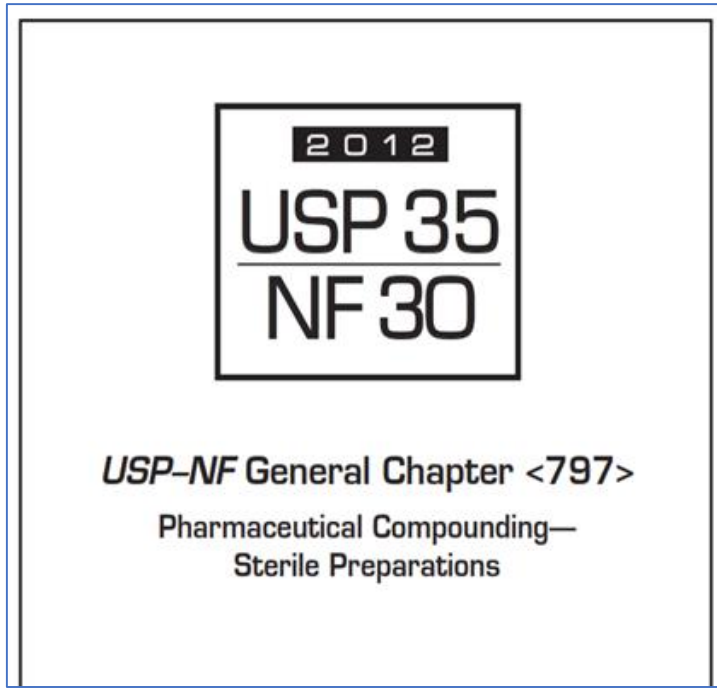
- Policies and procedure establishment
- Compounding area design
- Standards and drug information preparation
- Personal Protective Equipments
- Appropriate Supplies & Devices
- Educated Pharmacist & Personnel
- Personnel training

Policies and procedures

- Policies must be developed that address the entire scope of potential occupational exposures within the workplace
 - An education and training program for workers involved with hazardous drug handling
 - A quality assurance program to monitor adherence to safe handling procedures

Policies and procedures

- Procedures should address the appropriate:
 - Storage in the receiving and storeroom areas
 - Preparation and administration of parenteral formulations
 - Cleanup of spills
 - Management of acute exposures
 - Disposal of hazardous agents and supplies used to prepare and dispense chemotherapy



2017

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USP General Chapter <800>
*Hazardous Drugs –
Handling in Healthcare Settings*

Reprinted from USP 40—NF 35, Second Supplement (2017)

Compounding area

- Engineering controls are required to protect the preparation from cross-contamination and microbial contamination (if preparation is intended to be sterile) during all phases of the compounding process.
- Engineering controls divided into two categories:
 - Primary level (a ventilated device)
 - Secondary level (ISO Class 7 buffer room with an ISO class 7 ante-room)

Primary level

- To minimize worker and environmental HD exposure when directly handling HDs
- A Class II or III BSC
 - Class II BSC types A2, B1, or B2 are acceptable
 - An ISO Class 5 or better air quality

Secondary level

- ISO Class 7 buffer room with :
 - HEPA-filtered supply air, a **negative pressure** between 0.01 and 0.03 inches of water column relative to all adjacent areas and a minimum of 30 ACPH.
 - Must be externally vented.
- An ISO class 7 ante-room :
 - Minimum of 30 ACPH of HEPA-filtered supply air
 - Maintain a **positive** pressure of at least 0.02 inches of water column relative to all adjacent unclassified areas
- Containment segregated compounding area

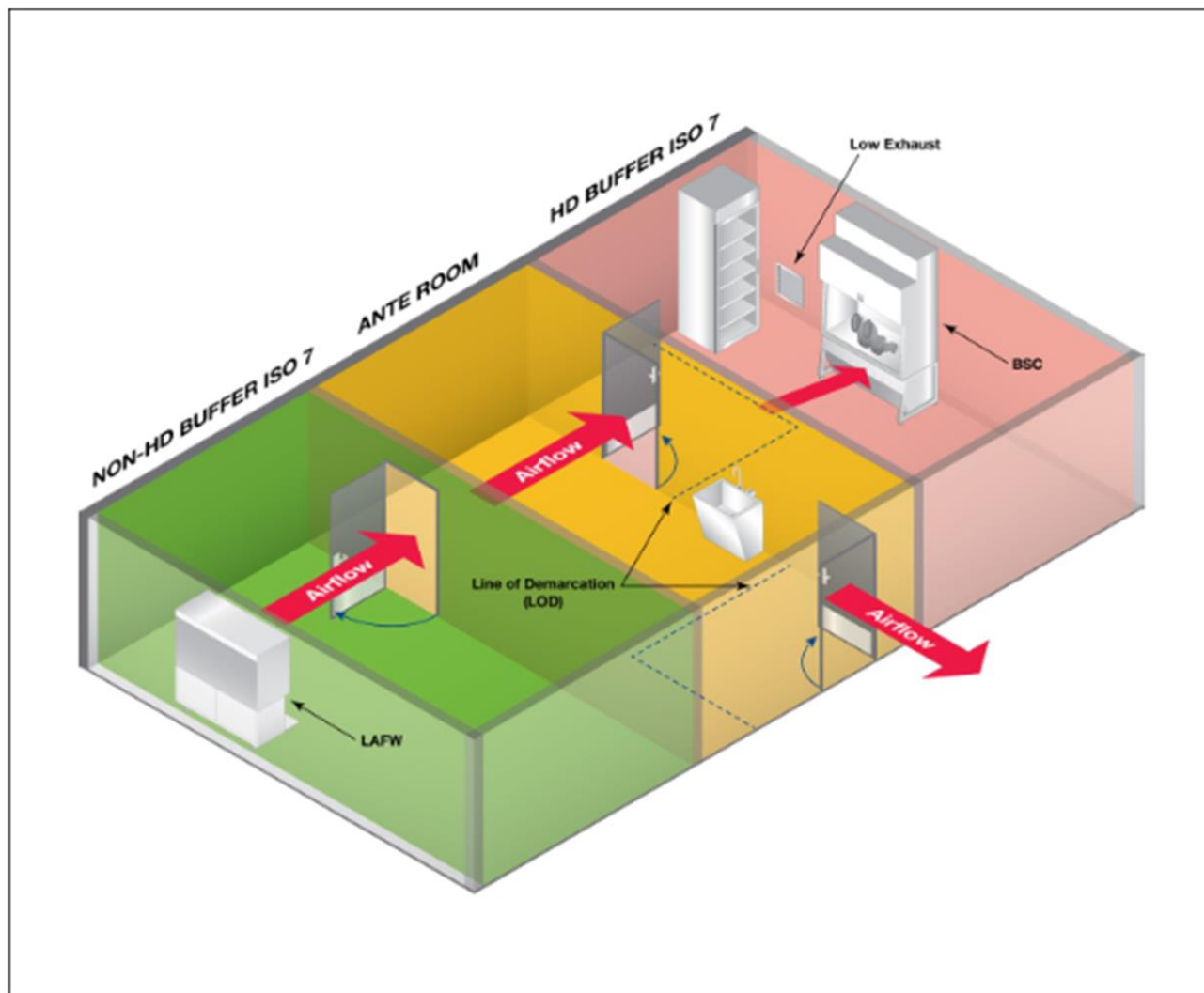


Figure 4: HD buffer and non-HD buffer share an ante room

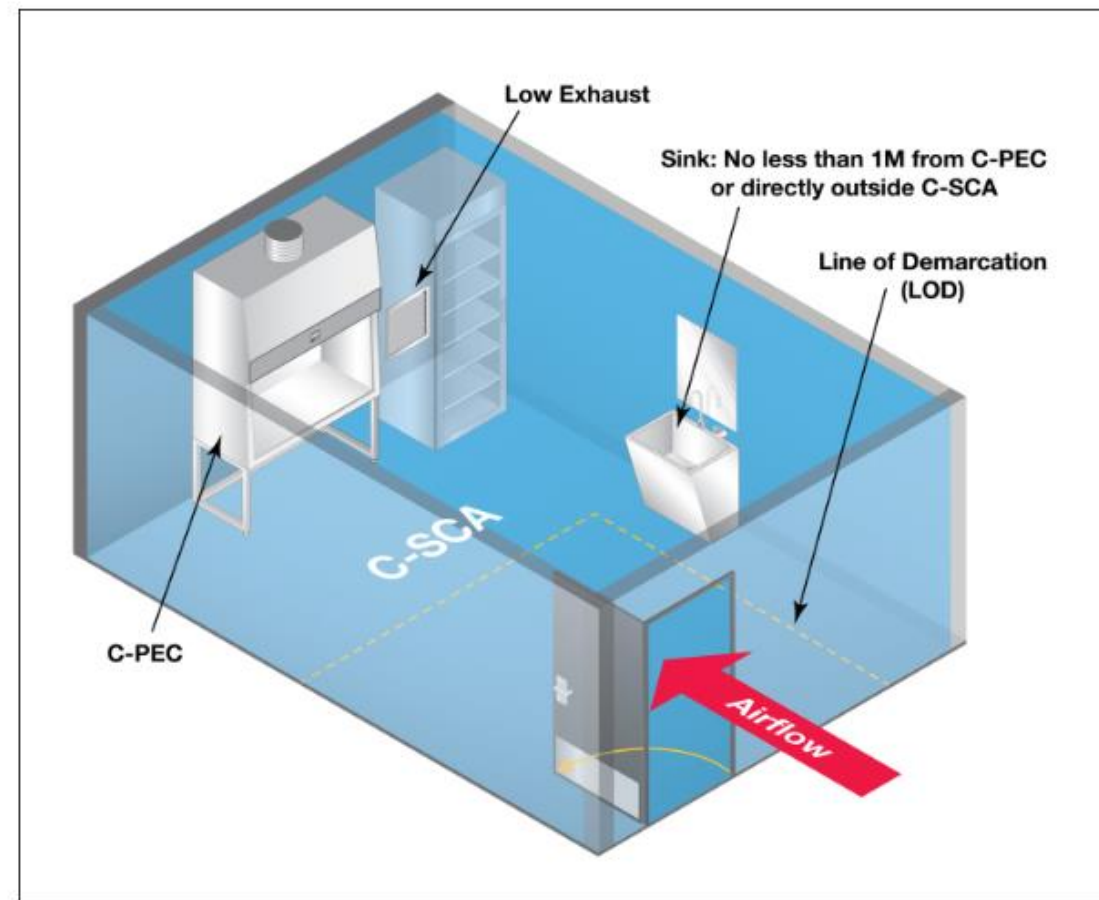
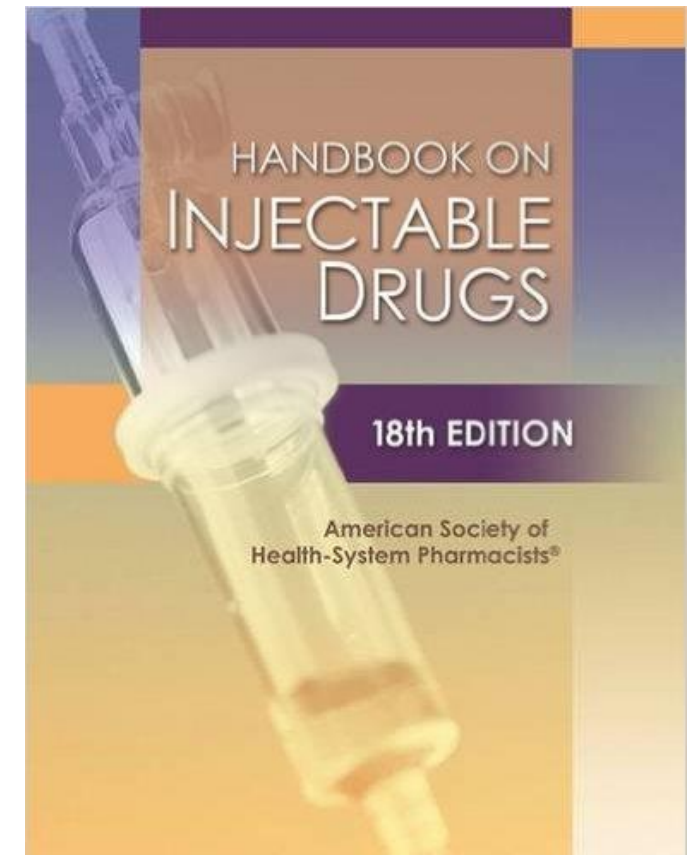
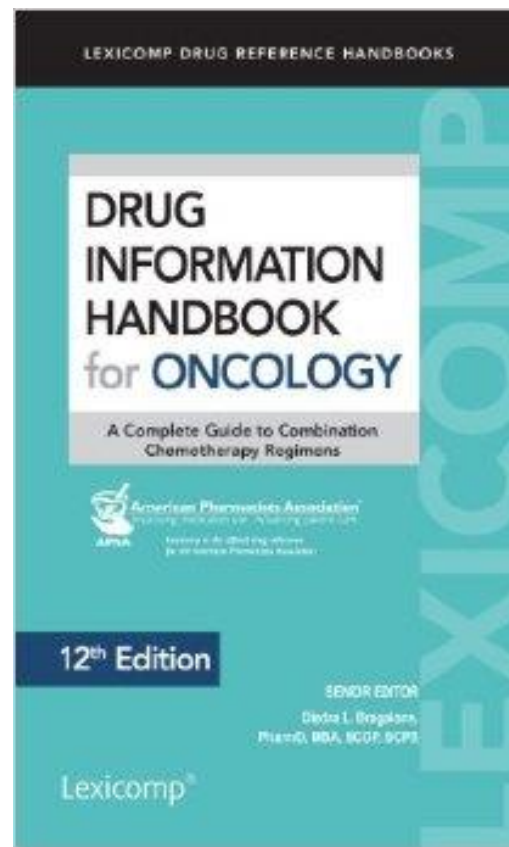
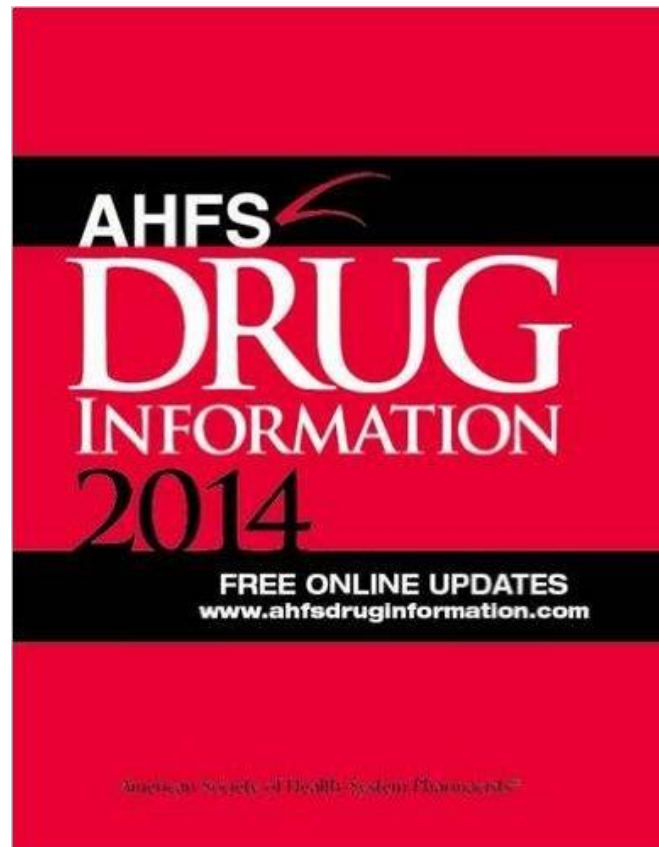


Figure 3: Compounding in a C-SCA

Standards and drug information preparation

- Reconstitution and preparation of anticancer drugs can be a complex process
- Standard charts prepared by pharmacists will help with accurate compounding or preparation
- Dilution quantity, type of carrier solutions and volumes, specific containers, infusion rates, and expiration dates

Standards and drug information preparation





Systemic Therapy Program

Policy & Procedure

PREPARATION OF CANCER CHEMOTHERAPY



Safe Handling Standards Manual

The BC Cancer Agency Pharmacy Practice Standards for Hazardous Drugs contains aseptic and safe handling guidelines for cancer medications.

The guidelines in this manual meet best practice standards set forth by WorkSafe BC, USP797, NIOSH, CSHP, ASHP, CAPhO and ISOPP.

All documents in this manual can be downloaded as Adobe Acrobat PDF documents.

In this section

Pharmacy	
Drug Funding	
Frequently Asked Questions	+
Patient Information	
Safe Handling Manual	

Personal Protective Equipment

- PPE Provides worker protection to reduce exposure to HD aerosols and residues
- Gowns, head, hair, shoe covers, and two pairs of chemotherapy gloves are required for compounding sterile and nonsterile HDs



Appropriate Devices

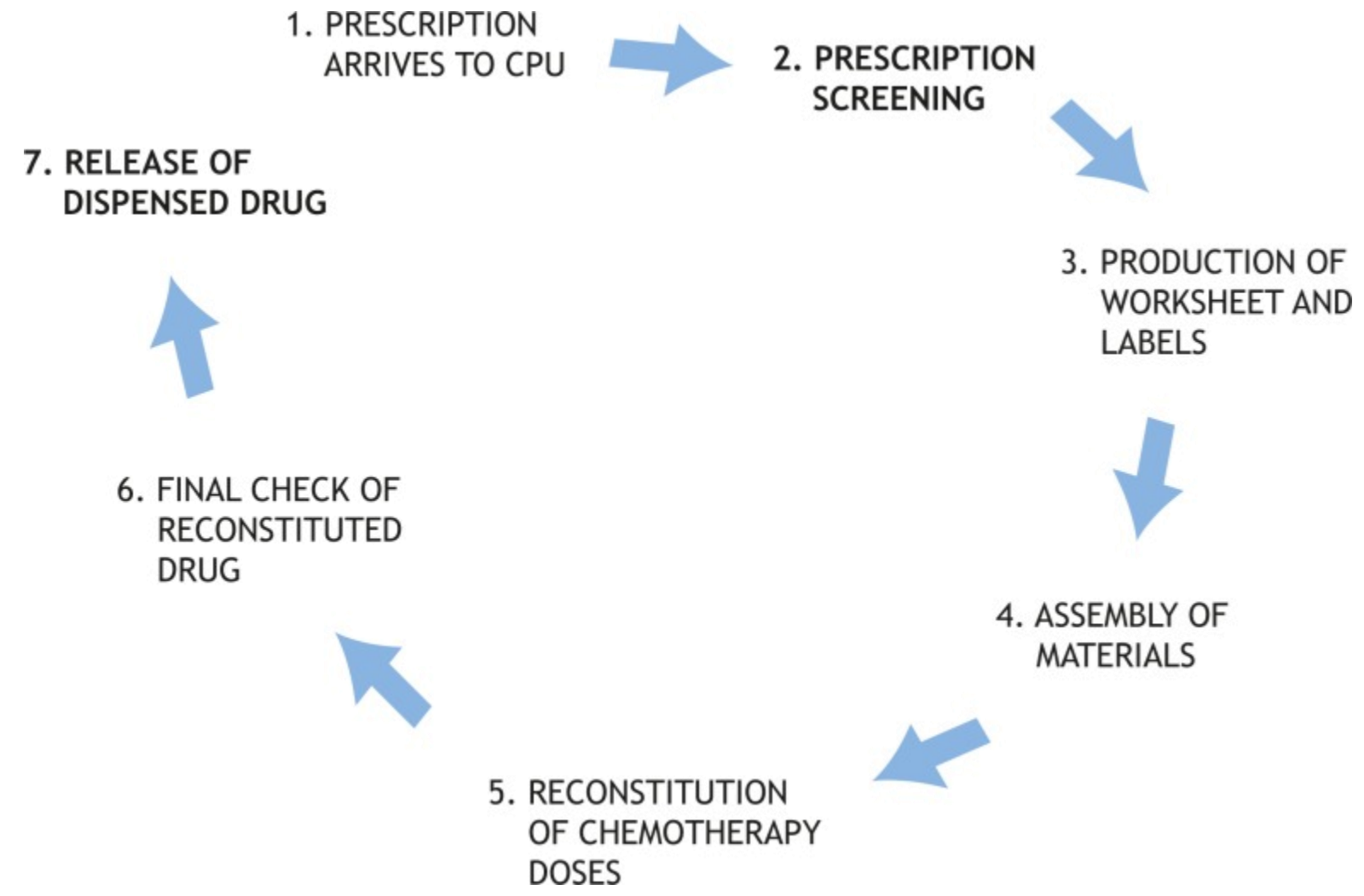
- Luer lock fittings
- Chemotherapy Dispensing Pins
- Containers

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Personnel training

- All personnel who handle HDs must be trained based on their job functions
 - Receipt, storage, compounding, repackaging, dispensing, administrating, and disposing of HDs
- The training must include at least the following:
 - Overview of entity's list of HDs and their risks
 - Review of the entity's SOPs related to handling of HDs
 - Proper use of PPE
 - Proper use of equipment and devices (e.g., engineering controls)
 - Response to known or suspected HD exposure
 - Spill management
 - Proper disposal of HDs and trace-contaminated materials



Administration

- Administration remains a nursing mainstay, especially for parenteral drugs
- Nurses often ask for information on compatibilities with multiple infusion lines, scheduling and sequencing, infusion rates & ...
- Providing supportive care in cases of extravasation antidotes and protocols
- OPSs can assure that premedication are ordered correctly
 - Prehydration and forced-diuresis protocols in high-dose chemotherapy regimen
 - Prophylaxis with corticosteroids, antihistamine, and acetaminophen to avoid anaphylactic or allergic reactions for some special drugs
 - Prophylaxis protocols for NV

Monitoring and evaluation

- Pharmacists and nurses have demonstrated the ability to prevent potential adverse drug reactions by 50% and 40% respectively
- Monitor lab tests such as blood parameters , liver & renal function to assure within acceptable limits for the next cycle of chemotherapy
- Monitor patient for ADRs & toxicity and management protocols

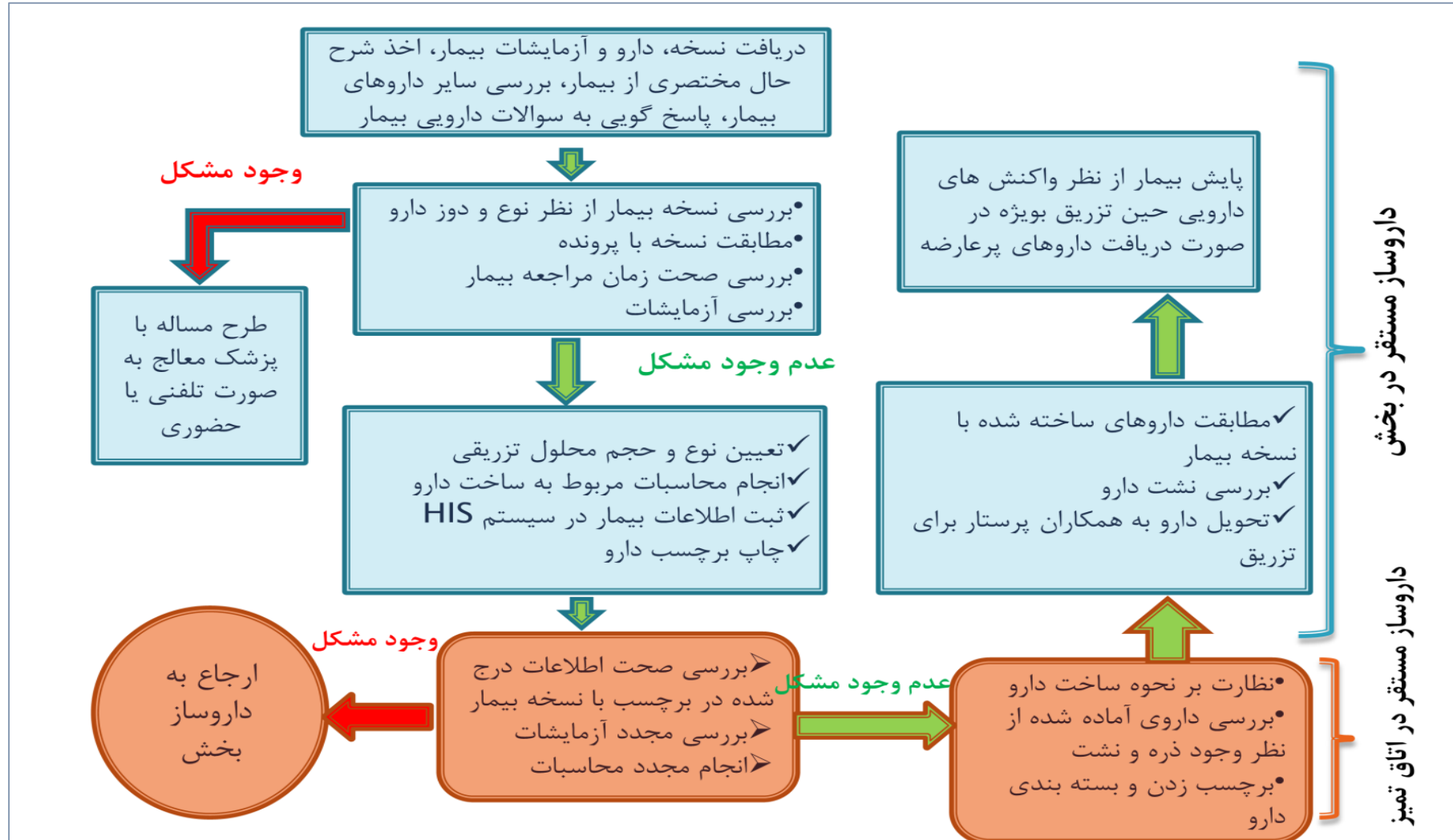
Patient education

- OPSs can counsel new chemotherapy patients with a review of all the patient's medications, including prescriptions, over-the-counter, vitamins, and herbal products, for:
 - Drug-chemotherapy interactions, drug-drug interactions, duplicate therapy, and potential side effects.
- Education on adverse effects, compliance with supportive care medications, and any lifestyle modifications, such as contraception, diet & ...
- Education on proper handling and storage of oral agents

Our experience...

- A standard chemotherapy preparation unit for out patient setting
- In this unit, three pharmacists and four pharmacy Technicians under supervision of a clinical pharmacist prepare about 200 chemotherapy drugs in a day





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