Chapter 14: Administration of Chemotherapy

Purpose: To provide guidelines for the administration chemotherapy.

Scope: These guidelines apply to the patients who are receiving chemotherapy in preparation for hematopoietic stem cell transplantation at the University of Kentucky Markey Cancer Center.

I. Ordering Routine Chemotherapy
II. Ordering High-Dose Chemotherapy
III. Consent for Administration of Chemotherapy
IV. Chemotherapy Sticker Procedure
V. Errors in Administration of Chemotherapy
VI. Calculation of Weight and BSA
I. **Ordering Routine Chemotherapy**

A. **Purpose:** To insure that all chemotherapy orders are interpreted, processed and prepared appropriately.

   1. To establish consistency of ordering, preparation, and delivery of chemotherapeutic agents.
   2. To avoid chemotherapy processing and preparation during shifts which are not staffed to accommodate preparation of these complex therapies (i.e., second and third shifts).

B. **Prescribing**

   1. Orders written for chemotherapy agents must be,
      a) written on the standard pre-printed “Chemotherapy Order Form” (Form J443, adult chemotherapy or J473, pediatric chemotherapy) – verbal orders are not acceptable;
      b) the form should be filled out completely, including the patient’s diagnosis, height, weight, BSA, allergies and protocol or reference (if indicated);
      c) cosigned by an attending certified oncologist (list available in the Chief of Staff's office) and initialed by person penning order (if different than person signing order) before being processed by the pharmacy;
      d) written using only the generic name of the agent and free of any non-approved abbreviations used to identify the agent being prescribed (pharmacist may clarify chemotherapy orders and write the generic name next to any commonly used abbreviation);
      e) free of any number prefixes, such as “5-fluorouracil”, which could be misinterpreted as part of the order’s dose or schedule requirements; in this example, write “fluorouracil”;
      f) written using the metric system;
      g) written as dose/M² or dose/kilogram or dose/AUC (area under the curve) along with the calculated dose on the actual order;
      h) free of trailing zeros;
      i) written as the amount per dose per day (e.g Cisplatin 20mg/M² daily x 5 days, or Cytarabine 3000mg/M² bid on days 1,3 and 5) –never written as total amount needed per course of therapy;
      j) accompanied by a copy and/or name of a readily available reference or the protocol name and number used in determining the prescribed regimen. [P-03-02], (11) accompanied by a completed “Consent for Treatment of Cancer with Chemotherapy” form (J1101 or J1101S) for all first cycles of cytotoxic chemotherapy.

   2. Upon receipt of a chemotherapy order, the pharmacist will confirm that the order has been prescribed according to the criteria above. The pharmacist must contact the attending physician to request that any order not meeting these criteria be re-written on a Chemotherapy Order Form. Verbal orders are not acceptable.

   3. Once the prescribing criteria have been met, the pharmacist is responsible for verifying the accuracy of the order by,
a) reviewing a copy of the original document used in determining the prescribed regimen (e.g. investigational protocols, chemotherapy references, treatment protocols);

b) recalculating the patient’s BSA, unit conversions and patient-specific dose;

c) confirming the diagnosis and appropriateness of the chemotherapy regimen for the patient’s diagnosis,

d) confirming the dose and frequency are appropriate,

e) reviewing base fluid, administration times and anti-emetic regimens for appropriateness,

f) confirming record of completed “Consent for Treatment of Cancer with Chemotherapy” form; documenting in the pharmacy computer system when an informed consent has been signed. (J1101 or J1101S).

4. If there is a discrepancy in the medication order, the nurse caring for the patient will be notified of the problem and the possible delay in the delivery of the anti-neoplastic agent. The oncologist who signed the order (or covering oncologist) must be contacted by the pharmacist for order clarification.

5. All changes to original orders must be documented on a chemotherapy order form.

a) Other than rate of administration, which may be written on a non-chemo order form, any changes to the original order must be written on a pre-printed chemotherapy physicians order form (J443 or J737) and faxed to the pharmacy satellite.

b) This faxed copy must be placed with the chemotherapy workcard and original order.

c) By writing it on the chemotherapy form, it guards against the chance of being missed when processing multiple orders, or the therapy being recopied during the next visit, not noting the change that was written on a regular physician order.

d) All work for new orders (except the checking of the prescribed dose to the original protocol) must be double checked by a second pharmacist.

6. If the physician is not available to physically rewrite the order, the pharmacist must write the change order on a chemotherapy form and read-back from the actual written transcription to the physician. The guideline for telephone orders should be followed. The pharmacist may clarify information on the base fluid, rate of administration, pre-and post medications and fluids and administration dates.

7. If patient misses a day of chemotherapy secondary to illness, weather, anemia, neutropenia or thrombocytopenia, the dates of the chemotherapy may be adjusted on the current order by the physician or rewritten on a chemotherapy order form. If the pharmacist or nurse is required to adjust the dates, he/she must confirm the adjusted dates with the physician first.

8. Unless specified, the pharmacist will determine the vehicle and the volume of the diluent to be used based upon the protocol or reference, drug stability and infusion guidelines listed in the package insert or the literature.
9. The pharmacist should review all appropriate lab values & document these on the chemotherapy workcard kept in the pharmacy satellite.

10. Upon completion of the verification process, the pharmacist or chemotherapy trained technician will prepare a chemotherapy workcard for use in preparing the prescribed doses. One card must be filled out in its entirety for each patient. The pharmacist or chemotherapy trained technician will record the following information: patient name and record number, date of birth, height, weight, body surface area, diagnosis, allergies, protocol number, drug, drug volume, diluent, administration schedule, administration directions, special instructions (e.g., protect from light, glass only, etc.) The compounding technician or pharmacist must double check the calculation when preparing every dose and record the compounded dose on the inside of the workcard. Changes in subsequent doses should be noted on the card or a new card may be generated.

11. A copy of the order form should be attached to the chemotherapy work card. The order is then entered into the pharmacy computer system under the patient’s medication profile. The labels should be double-checked for accuracy by the compounding technician or pharmacist for all doses. All syringe labels must contain the final concentration of the product (e.g. Doxorubicin 50mg/25ml). All minibag or large volume parenteral labels must include the volume of each component as well as a total volume and rate of administration.

12. Two pharmacists must check the chemotherapy workcard, computer entry, and labels for all new adult chemotherapy orders and all new or repeat pediatric chemotherapy orders. The second pharmacist must review the computer entries against the original chemotherapy order and chemotherapy workcard.

13. The pharmacist preparing the chemotherapy workcard must enter their initials on the chemotherapy order. The pharmacist double-checking the chemotherapy order entry should also initial the chemotherapy order. The verification process must be followed completely before any dose can be dispensed. Chemotherapy workcards are then forwarded to the technician for dose preparation.

C. Chemotherapy Preparation

1. The technician responsible for preparing the doses must gather the fax copy or the original order, chemotherapy workcard, patient-specific labels, medication vials, and associated supplies to be used in the process.

2. The technician must initial the label and write on the label the volume of the drug that was added. The technician is responsible for completing the chemotherapy workcard indicating: The time and date the product was prepared, the drug used, the drug concentration, volume of drug used, the solution (if applicable), and the lot number and the expiration date from the drug vial. The technician must initial the workcard and perform all calculations associated with the compounding process. If an oral chemotherapy drug is to be physically manipulated or repackaged into a larger gel cap; the process must be done in a biological safety cabinet (vertical flow hood) to prevent inhalation exposure.

3. Upon completing the preparation process, the dose should be labeled and a chemotherapy caution label affixed to the final product. The final product and all vials, minibags and/or syringes used in the preparation of the dose must be checked by a pharmacist. The syringes for each drug and/or solution used in preparing the product (including syringes used to dilute drug vials) must be pulled back to indicate the measured volume. Needles must be recapped and left on the syringes before placing in the bin.
4. All final parenteral chemotherapy medications prepared need to be spiked with a buretrol or non-PVC tubing set in the chemo hood, excluding IV push syringes, leucovorin, and drugs that will not be spiked prior to administration (intra-arterial & intrathecal).

5. All pharmacy-prepared chemotherapy agents must be double checked. If the pharmacist is involved in the preparation of the dose, a pharmacist who did not prepare the dose must perform the final check. This may require the assistance of other pharmacists.

6. The pharmacist reviewing the prepared dose must check each prepared dose and associated supplies and label against the original order and chemotherapy workcard. The pharmacist, working independently, must verify that the final preparation includes:
   a) the correct drug has been used,
   b) the drug was reconstituted correctly using the correct volume and diluent,
   c) the volume of drug used was accurately measured for the prescribed dose,
   d) the label is correct in regards to patient, dose number, unit, hospital id#, drug components, route, rate, concentration, storage conditions, expiration date, caution statements (any dose that is prescribed to be administered by any route other than intravenous (e.g. intrathecal) must bear a label indicating the appropriate route for administration), final container integrity, correct type of final container (e.g. syringe and/or mini-bag type),
   e) all chemotherapy doses must be placed in a separate transport bag,
   f) any IVP doses in syringe should be less than three quarters full, to minimize the risk of a chemo spill,
   g) the maximum syringe size dispensed should be 30ml,
   h) the pharmacist must write their P/R number on the chemotherapy workcard and product label to signify product verification.

7. Following the pharmacist double check, the chemotherapy dose is placed in a brown, protect from light plastic sleeve and then placed in a zip-lock chemotherapy transport bag. A handwritten label with the patient’s name (first and last), hospital unit location should be placed on the outside of the transport bag. The pharmacist must initial the transport bag label to indicate that they have matched the patient name on the final product with the name on the outside label of the transport bag. PLEASE NOTE: To prevent the nurse from using the outside label for identifying the bag contents, DO NOT place a duplicate computer generated label or any other type of label that bears a drug name on the outside of the transport bag.

8. For patients receiving multiple-day regimens, the satellite pharmacist in collaboration with the nurse or pharmacist on-service will communicate any changes in the patient’s therapy, or clinical status that would alter the chemotherapy regimen. If any modification is necessary, the pharmacist responsible for compounding the product will be notified by a phone call or via facsimile, and the computer entry will be modified to reflect the change. The pharmacist responsible for preparing future doses will record all changes on the chemotherapy workcard.
9. After the patient is discharged from the hospital, the chemotherapy workcard and faxed copies of original orders must be filed in the satellites’ inactive chemotherapy order file.

II. Ordering High-Dose Chemotherapy

A. The procedure for ordering high-dose chemotherapy is outlined and ordered in the same manner as routine chemotherapy. Please consult 16.1 Ordering Routine Chemotherapy for procedures.

III. Consent for Administration of Chemotherapy

A. Consent for treatment with chemotherapy must be obtained prior to the administration of the first cycle of chemotherapy as outlined in Hospital Policy HP06-09. Please consult HP06-09 for the complete hospital policy regarding “Consent for Treatment”.

1. Consent for chemotherapy must be documented on form J1101.

2. The following are exempt from required completion of the consent for Treatment of Cancer Chemotherapy, J1101:
   a) Patients receiving conditioning chemotherapy for a stem cell or bone marrow transplant who have signed an informed consent for transplantation.
   b) Patients receiving chemotherapy agents for the treatment of non-malignant conditions (e.g. methotrexate for rheumatoid arthritis)
   c) Patients receiving hormonal therapies (e.g. Tamoxifen, Anastrozole, Flutamide, Leuprolide, etc.)
   d) Patients receiving “naked” monoclonal antibodies (e.g. Rituximab, Alemtuzumab etc.)
   e) Patients receiving biologic agents (e.g., interferon, etc.)

B. Chemotherapy Administration (Related policies: Hp6-09 & MC08-05)

1. All nurses who administer chemotherapy within Markey Cancer Center are required to have certification in the Oncology Nursing Society's Chemotherapy and Biological Therapies Program.

2. Upon receipt of the chemotherapy dose (either an IVP dose or mixed bag), the administering RN and another chemo certified RN or chemo trained pharmacist will compare the chemotherapy drug label and the MAR to the chemotherapy order (electronic or written).

3. The administering RN will view the information on the chemotherapy bag/syringe and the MAR while the other RN will view the chemotherapy order.

4. The nurse handling the chemotherapy bag should remember to wear nitrile gloves. Each nurse will compare and verify that the following information is correct:
   a) Dosage (should be calculated)
   b) Concentration
   c) Volume
   d) Diluent
   e) Patient’s height, weight, and BSA
f) Rate of infusion

5. After confirming that the chemotherapy and MAR match the electronic or written order, both nurses will sign the MAR next to the time of administration.

IV. Chemotherapy sticker procedure

A. Regimens that include multiple days/doses of chemotherapy must have duplicate chemotherapy labels generated.

B. These duplicate labels should have a sticker affixed with the number of the dose noted. The appropriate duplicate label should accompany all doses administered to patients on the BMT, HO and GYN (only for multiple day therapies) services.

C. The duplicate labels may be used by the nursing staff to document doses as they are given.

V. Errors in administration of chemotherapy (Related policy- HP10-33)

A. If the report concerns a medication-related patient incident, the director of Pharmacy will coordinate the investigation with the appropriate Pharmacy or nursing staff.

B. In collaboration with the nursing practice improvement coordinator, medication-related patient incidents will be reviewed with the pharmacy quality improvement coordinator and other appropriate pharmacy administrators.

C. A quarterly summary report of findings, actions taken, and recommendations for future action will be provided to the Pharmacy & Therapeutics Committee and Pharmacy/Nursing Committee.
VI. **Calculation of Weight and BSA**

A. All patients will be weighed upon admission into the hospital or prior to writing chemotherapy orders.
   1. All weights must be recorded in kilograms (kg)
   2. Chemotherapy orders are based on patients actual body weight (ABW) unless the patient is greater than 125% of ideal body weight (IBW).
   3. For patients greater than 125% of IBW consult transplant protocol or chemotherapy regimen for appropriate dosing parameters (ABW vs corrected body weight).

B. Equations used in chemotherapy calculations:

C. Ideal body weight (IBW) : (Devine; Drug Intell Clin Pharm 1974; 8: 650)
   1. IBW male = 50 (kg) + (2.3(kg) X each inch over 5 ft)
   2. IBW female = 45.5 (kg) + (2.3(kg) X each inch over 5 ft)

D. Corrected Body Weight (CBW)
   
   \[0.25(ABW – IBW) + IBW\]

E. BSA Calculation (Dubois Arch Internal Med 1916; 17: 863)
   
   \[
   \left(\frac{\text{Wt (kg)}}{10,000}\right)^{0.425} \times \left(\frac{\text{Ht (cm)}}{100}\right)^{0.725}
   \]

VII. **See Also:**

A. BM08-045 Administration of High dose Therapy