

## **Guideline for the Ordering, Preparation and Administration of Chemotherapy**

The following document details the procedures to be followed for the prescribing, preparation and administration of chemotherapy. It outlines the roles and responsibilities of all clinicians involved in the process.

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In order to ensure the safe prescribing and administration of **systemic and oral** chemotherapy agents to all cancer patients, these process steps will be followed:

### **Section 1: Ordering Chemotherapy**

#### **1. Ordering Process:**

- a) Oncologists, Hematologists and Cancer Care Program General Practitioners in Oncology may prescribe chemotherapy. In addition, responsible physicians with a special interest in Oncology may prescribe chemotherapy under the direction of the Oncologist, however, **only after** the completion of education/orientation as defined by the Oncology Education for Physicians Working Group.
- b) The prescribing physician must obtain written patient consent prior to ordering chemotherapy.
- c) Prescriptions for all chemotherapy drugs must be written, not verbal, and changes to any of these prescriptions or doctors' orders must be written. All chemotherapy prescriptions must be written on the institutions approved medication order form. If an order or prescription requires a change, a new order must be written, signed and dated by the physician before the treatment is administered or dispensed. Prescriptions for oral chemotherapy agents must **NOT** indicate repeats or refills.
- d) Whenever possible, physicians should order chemotherapy immediately after examining the patient, and treatment should take place as soon as possible.
- e) All prescribing physicians are responsible for the drugs dosage calculations, and route of administration specified in the chemotherapy order. They ensure the body surface area calculations are accurate and all relevant safety parameters such as complete blood counts or bio-chemical tests have been checked. A maximum of a 5% variance from the original prescription (according to protocol

dosages) in dosage calculation is permitted. If the variance exceeds 5% the treating Oncologist is to be consulted.

- f) Body surface area (BSA) calculations are based on actual body weight for all medical/gynecologic oncology protocols. If the patient's body weight changes by more than 10%, then the BSA must be recalculated and the dose adjusted accordingly.
- g) When ordering and administering Carboplatin refer to the specific guideline for the dosing and administration of Carboplatin (See Appendix 1).

## 2. Prescription Elements:

Prescriptions for chemotherapy drugs must be complete, clear and simple to follow. When chemotherapy medication orders are completed by the physician and noted by nursing, they are forwarded to pharmacy. Treatment information must contain the following elements for each order:

- Prescribing date and time of order
- Patient name and HCN (Health Care Number) on each page
- Patient's height and weight
- Body surface area (BSA)
- Relevant lab data to calculate dose (e.g., serum creatinine, bilirubin)
- Specific indication for the treatment (cancer type and site)
- Protocol name
- Name of drug – use approved generic drug names; no abbreviations
- Protocol dosage of the drug (usually units/m<sup>2</sup>, units/kg, or AUC)
- Calculated patient dose and number of days of treatment
- Calculated dose [if dosage reduction is required, the standard total dose is provided minus the amount of percentage reduction (e.g., 400 mg/m<sup>2</sup> minus 30% = 280 mg/m<sup>2</sup> dose)]
- Number of cycles and day number
- Route of administration and any administration instructions
- Starting dates (and times when appropriate)
- Allergies or sensitivities.

## 3. Physician Assessment:

- All patients must be seen and assessed by the responsible physician prior to day one of each cycle of chemotherapy
- Patients do not have to be seen on the same day as treatment, however, patients are to be seen **within five (5)** days prior to treatment
- Physicians are also required to see and assess patients that are identified during the nursing assessment as having a change in condition
- Patients may be seen in the physician's office, the hospital, or clinic setting
- The physician must complete a history and physical examination on all patients. The patient history must be taken to verify the presence of side effects and toxicities of chemotherapy treatment. If necessary, dosage adjustments are made in accordance with the instructions of the treating

Oncologist. In addition, the history and physical examination provide an opportunity to assess for evidence of disease response/progression

- The physical examination must include an assessment of vitals, oral mucosa, skin, chest, abdomen, cardiovascular, respiratory and the known site of the disease
- Blood work should be ordered within forty-eight (48) hours prior to treatment.

### **Chemotherapy Ordering Process for Patients Receiving Chemotherapy outside the Dr. H. Bliss Murphy Cancer Center**

1. All patients receiving chemotherapy treatment (**IV or Oral**) at health care facilities outside the Dr. H. Bliss Murphy Cancer Center must have a **chemotherapy letter** written. The chemotherapy letter is to serve as a guide for therapy and care, and forms the basis for the chemotherapy prescription. A copy of the letter must be maintained on the patient's chart in the outpatient nursing unit in the treating hospital.
2. The chemotherapy letter is to be written by the attending Oncologist.
3. The chemotherapy letter is to be personally addressed to the physician in the regional center who will be overseeing the patient's care and chemotherapy administration. Letters addressed to the **"Physician In-Charge"** are **unacceptable**.
4. If the patient is transferred to another site or to be treated by a physician, other than the responsible physician named on the chemotherapy letter, the responsible physician overseeing the patient's treatment must contact the Oncologist for approval, and to arrange transfer of the patient. A new chemotherapy letter must be written.
5. The Oncologist must write all chemotherapy letters on the Eastern Health Care letter template. The hand written chemotherapy letter must be typed. Hand written chemotherapy letters are not acceptable.
6. The Oncologist and the Clinical Pharmacist must check and sign all typed chemotherapy letters before they are sent out to the regional centers.
7. All chemotherapy letters, including those for oral chemotherapy agents, must be faxed to the responsible physician caring for the patient, the pharmacy department preparing the chemotherapy, and the nursing unit responsible for administering the chemotherapy.
8. All chemotherapy letters must have the following information:
  - a) Patient name, address and HCN (Health Care Number) on each page
  - b) Patient data pertinent to the medication being administered such as: age, height, weight, BSA, serum creatinine, and estimated creatinine clearance
  - c) Diagnosis and intent of treatment
  - d) Chemotherapy regimen including the name of the protocol
  - e) Dose and dosing information such as the percentage dosage reduction if dose reduced. If dosage is based on BSA, the dose per meter squared and

- the calculated dose to be administered should be written. If based on AUC, the body weight used in the calculations must also be included
- f) Anti-emetics and pre-medications to be administered
  - g) Cycle frequency
  - h) Duration of therapy
  - i) Allergies or sensitivities
  - j) Details of required follow-up
9. All chemotherapy letters must be accompanied by the patients 1<sup>st</sup> assessment summary and/or recent progress notes. If there is no patient 1<sup>st</sup> assessment available from the primary Oncologist, then the covering physician should be contacted to review the patient's chart. Otherwise, if there is no urgency the chart should be put on hold until the primary physician returns.
10. Oncologists who see patients in the regional center, where they are to be treated, must write a chemotherapy letter for the patient. The nursing staff at the regional center will fax the handwritten chemotherapy letter template to the health records staff of the Dr. H. Bliss Murphy Cancer Center for typing.
11. Chemotherapy letters written for protocols that are **not** approved must be reviewed and approved by the Provincial Systemic Therapy Advisory Committee and the Clinical Chief of the Cancer Care Program. The prescribing Oncologist must attach the published scientific literature and other supporting evidence to the chemotherapy letter.
12. Upon receipt of a chemotherapy letter, the physician in the regional center overseeing the care of the patient must transcribe the chemotherapy orders onto the institutions approved medication order form. **Signed chemotherapy letters are not to be sent to the pharmacy department for the ordering of chemotherapy.**
13. Changes to chemotherapy prescriptions or doctors' orders must be written. If an order or prescription is changed, the reason for the change(s) must be documented, and the change(s) must be signed and dated by the physician before the treatment is administered or dispensed. In this situation, a new prescription or doctors' order must be written.
14. Physicians in the regional centers are responsible for the drug dosage calculations and must specify route of administration in the orders. They ensure that the body surface area calculations are accurate and all relevant safety parameters such as complete blood counts or bio-chemical tests have been checked. A maximum of a 5% variance from the original prescription (according to protocol dosages) in dosage calculation is permitted. If the variance exceeds 5% the treating Oncologist is to be consulted.
15. When ordering and administering Carboplatin refer to the specific guidelines for the dosing and administration of Carboplatin (Guideline for the Dosing and Administration of Carboplatin, See Appendix 1). In addition, the Cancer Care Program Website on the internet contains a link to calculate the carboplatin dose. This link can be found by going to [www.easternhealth.ca](http://www.easternhealth.ca). The carboplatin

calculator can be found by choosing the “health care professionals” tab followed by the “cancer care health care professionals tab”. The Oncologist will indicate on the chemotherapy letter the formula and weight used in calculating the dose.

16. Physicians in the regional centers are responsible for performing the physician assessment as outlined above.

## Section 2: Pharmacy

1. **Chemotherapy letters** received from Eastern Health must be written by an Oncologist, and reviewed and signed by the Oncologist and the Clinical Oncology Pharmacist.
2. Prior to the preparation of chemotherapy, a **written order** must be received at the patient's pharmacy site, from the physician at that site who is responsible for providing chemotherapy services to the patient.
3. Upon receipt of this order the pharmacist is to verify the order with the original chemotherapy letter to ensure that any necessary adjustments in dosage, due to weight change, are correctly calculated.
4. The chemotherapy letter from the Oncologist / Hematologist is to be placed in the patient's specific file in the pharmacy department.
5. Chemotherapy is then prepared as per the policy and procedures of the pharmacy department at the treating facility.

### Pharmacy Processing of Chemotherapy Orders

1. The chemotherapy order is received in Pharmacy. All chemotherapy orders must have an **independent double check**.
2. The prescription is reviewed by the Pharmacist, ensuring all prescription elements identified in Section 1 above, are included. The prescription is then entered into the patient profile by a pharmacist or technician (trained in chemotherapy order entry) and labels are generated.
3. The pharmacist must verify the following information as correct:
  - a) Patient name, address and HCN (Health Care Number)
  - b) Body surface area calculation
  - c) Relevant laboratory data necessary to calculate dose (e.g., serum creatinine) and relevant blood work to meet specific protocol specifications as indicated on BC Cancer Agency website, Cancer Care Ontario website or other accepted reference.
  - d) Diagnosis and protocol
  - e) Correct dosage calculations

- f) Directions for administration and infusion time
  - g) Protocol, including cycle number, frequency and sequencing of therapy
  - h) Dilution, final volume (if required)
  - i) Area under the curve dosing (if required)
  - j) Appropriateness of medication, dose and route of administration, actual or potential allergies and sensitivities, actual or potential interactions as referenced against the site specific Pharmacy computerized patient record and the prescription.
4. An independent double check is performed verifying all points outlined in # 3 (a through j) above.

**The final pharmacy check must include but not limited to:**

- Compare the original prescription to the product label to ensure right patient, right drug, and right dosage, ensure correct base solution, route, final volume, drug dilution, volume calculation, protocol, allergies and storage requirements.
- Ensure required auxiliary labels, preparation and expiry date/time and packaging is completed.

**Verification of Chemotherapy Medication Orders by Pharmacy**

If a chemotherapy medication order is not consistent with usual or standard therapy (as defined by the Tumor Board or Pharmaceuticals and Therapeutics Committee and provided to pharmacy), the pharmacist reviews the protocol and any accompanying references to verify the order.

If the medication order is not consistent with usual or standard therapy, the Oncologist must seek approval of the tumor disease site group, Provincial Systemic Therapy Advisory Committee, and the Eastern Health Regional Pharmaceuticals and Therapeutics Committee. If the Oncologist is seeking a one time approval for a single patient, and treatment cannot wait for the preceding processes to be adhered to, then approval must be requested from the Cancer Care Program Director, Clinical Chief or delegate through the rapid response team approval process.

### **Section 3: Nursing**

Nurses administering chemotherapy must be certified in the administration of chemotherapy through the completion of an approved chemotherapy course. Certification will ensure knowledge of:

- Approved indications(s), contraindications, therapeutic dose range, dosage adjustments (if necessary), monitoring parameters and special precautions for all chemotherapy; recommended method of administration, rate of administration, potential risks related to administration, potential adverse reactions and toxicities and the management thereof
- Storage, stability, method of preparation, and recommended concentration of chemotherapy
- Patient education required regarding chemotherapy potential side effects, toxicities, and the management thereof; as well as self care during chemotherapy
- Policies regarding waste disposal and management of chemotherapy spill

#### **1. Prior to chemotherapy administration**

- a) Ensure a copy of the original chemotherapy letter that corresponds with the chemotherapy prescription is on the patient's chart. Copies of chemotherapy letters for oral chemotherapy agents, for patients outside St. John's, must also be maintained on the patient's chart on the nursing unit responsible for overseeing the care of the patient.
- b) Ensure that a copy of the informed consent for chemotherapy has been signed by the patient and physician and is maintained in the patient's chart.
- c) Provide appropriate patient education and teaching, including: specific chemotherapy information, blood counts, side effects and the management thereof. Instruct the patient regarding self care and their role in safety, including the use of personal protective equipment when handling blood, vomitus, or excreta, and double flushing the toilet when receiving chemotherapy.
- d) Ensure patients are assessed by a responsible physician prior to the delivery of each cycle of chemotherapy, oral or intravenous. Nursing staff must be aware of patient diagnosis and relevant patient history and are responsible for performing a nursing assessment during each chemotherapy treatment.
- e) Confirm that appropriate laboratory tests have been completed and are within acceptable limits.
- f) Determine appropriate site for venous access and utilize appropriate sterile technique for access. Or, assess and ensure patency, including blood return of central venous access device, per the institutional policy.
- g) Measure and record baseline vital signs.
- h) Verify patient's allergy history.
- i) Initiate pre-treatment therapies (e.g., hydration, test dosing, anti-emetics, anti-hypersensitivity meds, etc.).

#### **2. Chemotherapy Administration:**

- a) Don appropriate Personal Protective Equipment (PPE) for the handling of cytotoxic agents (double gloves and gown) (face shield is to be worn when there is a risk of a splash and safety mask when aerosolization is a risk).
- b) Ensure appropriate personnel and emergency equipment, including an approved spill kit and extravasation kit is ready and easily accessible.
- c) Ensure chemotherapy medications are received in clean, dry syringes or bags of IV fluids inside zipper-seal plastic bags and are appropriately labeled by pharmacy.
- d) Inspect bags before opening to ensure no spillage in the bag. If spillage has occurred, keep the container sealed and notify pharmacy.
- e) Review physician's chemotherapy orders. Confirm BSA and dose calculations.
- f) Ensure all chemotherapy is clearly labeled. At the time of chemotherapy administration, two clinicians (nurses, physicians, pharmacists) are to **independently** verify information on the chemotherapy label (i.e. patient name, HCN (Health Care Number), drug name, dosage, etc.). Two clinicians are to check final product label against original chemotherapy order.
- g) Ensure intravenous sets are primed with compatible IV solution, **NOT** chemotherapy medication. Use Luer-Lok fittings for intravenous sets and syringes.
- h) Bring chemotherapy agent to the patient. Place a plastic backed absorbent pad over the work area in case of spillage.
- i) Ensure positive patient identification (PPI) using two unique patient identifiers (i.e., verbal, arm band, hospital card/HCN, date of birth, mother's name, picture ID). The PPI process is to be consistent with the organization's policy regarding PPI and verified immediately prior to administering chemotherapy.
- j) When spiking a bag of chemotherapy medication, spike at waist level to decrease the risk of eye/face contamination.
- k) Assess health of venous access site. Assess for blood return, swelling and erythema.
- l) Attach syringe to intravenous system using needleless equipment (i.e., BD Lever Lock Cannula). Utilize the closed system equipment that your institution has adopted. Place gauze under the attachment area when connecting or disconnecting the syringe to catch any droplets.
- m) Monitor administration sets and IV sites for leakage.
- n) Check patient's condition and the status of the venous access site/device periodically during administration.
- o) Do not disconnect tubing at any point in the system until the tubing has been thoroughly flushed.
- p) Dispose all chemo waste in designated cytotoxic waste disposal containers, ensuring all is clearly marked as cytotoxic waste.
- q) Remove personal protective equipment and discard in designated cytotoxic waste disposal containers.

### 3. Post Chemotherapy Administration:

- a) Document on medication administration record, chemotherapy flow sheet and

nurse's notes as per the policy of the health facility where the chemotherapy is being administered.

- b) Ensure the patient has received direction regarding accessing care after hours if required.
- c) Ensure follow up appointments are coordinated as outlined in the chemotherapy letter.

Note: Refer to the Eastern Health Policy: *Management of Exposure to Hazardous Medications (HR-OH (O)-090)*.

## Administration of New Agents

In order to ensure patient and practitioner safety when a new agent is to be given, in addition to the procedure established by Eastern Health for the administration of chemotherapy, the following process will be followed. A *new agent* is defined as any medication that is to be given as an antineoplastic or an adjunct to an antineoplastic that has not been administered previously in a particular health care facility.

1. **PRIOR** to the initiation of therapy, the following criteria must be met:
  - a) All physicians, pharmacy and nursing staff must be aware of approved indication(s), contraindications, therapeutic dose range, dosage adjustments (if necessary), monitoring parameters and special precautions of all new agents.
  - b) All nursing and pharmacy staff must be aware of storage, stability, method of preparation, and recommended concentration of final product.
  - c) All physicians, pharmacy and nursing staff must be aware of recommended method of administration, rate of administration, potential dangers related to administration, and infusion related reactions.
  - d) All physician, pharmacy and nursing staff, as well as patients, must be educated with respect to potential adverse reactions, and management thereof.
  - e) All nursing and pharmacy staff must be aware of any issues regarding waste disposal.
2. There must be physician and nursing coverage to ensure patients are assessed by a responsible physician prior to chemotherapy delivery and throughout treatment.
3. Reference materials and information relating to the new agent must be kept where chemotherapy is given in order to facilitate access. References should be updated yearly if necessary.

The education listed above must be completed **PRIOR** to the administration of any new agent. This can be in the form of an in-service, via teleconference, videoconference, or other means deemed appropriate by the Provincial Systemic Therapy Advisory Committee. This education will be carried out by a clinical oncology pharmacist or an oncology nurse educator.

## **Appendix 1**

### **Guideline for the Dosing and Administration of Carboplatin (Paraplatin®) by the Provincial Systemic Therapy Program**

**Overview:** Carboplatin is a more stable analog of cisplatin and has less nephrotoxicity, neurotoxicity, ototoxicity and emetogenesis. It is currently indicated for use in the treatment of ovarian cancer. It is also used in the treatment of lung cancer, head and neck cancer, endometrial cancer, esophageal cancer, bladder cancer, breast cancer, cervical cancer, CNS tumors, germ cell tumors, osteogenic sarcoma, and high-dose therapy with stem cell/bone marrow support. Myelosuppression, primarily thrombocytopenia and leukopenia, is the major dose-limiting adverse effect.

The dosing of carboplatin is unique in that it is calculated according to a targeted area under the plasma concentration versus time curve (AUC) rather than according to body surface area (BSA). The formula used to calculate carboplatin doses (Calvert formula) has several variables that may lead to significantly different doses. This document is intended to clarify the use of the Calvert formula and, thereby, enhance patient safety and decrease the likelihood of calculation-related errors.

#### **Guideline:**

1. Carboplatin dose must be calculated by the prescriber according to the guideline outlined below.
2. Dose of carboplatin must be calculated using the Calvert AUC formula:

$$\text{Dose (mg)} = \text{Target AUC} \times (\text{GFR} + 25)$$

3. Glomerular Filtration Rate (GFR) is estimated according to the Cockcroft-Gault formula:

$$\text{GFR (mL/min)} = \frac{(140 - \text{age}) \times \text{weight (kg)} \times \text{N}}{\text{SCr } (\mu\text{mol/L})}$$

**N = 1.04 for females; 1.23 for male**

**SCr - serum creatinine concentration**

**Weight - Ideal Body Weight (IBW), in most instances**

4. Ideal Body Weight is to be calculated using the following formulae:

$$\text{IBW (males)} = 50 + 2.3 \times [\text{height (inches)} - 60]$$

$$\text{IBW (females)} = 45.5 + 2.3 \times [\text{height (inches)} - 60]$$

5. The lesser of the actual body weight (ABW) and the ideal body weight (IBW) shall be used in the Cockcroft-Gault formula unless the patient is obese. Obesity is defined as Actual Body Weight (ABW) greater than 130% of the Ideal Body Weight (IBW).

6. In the case of an obese patient, an Adjusted Body Weight (AdBW) is to be used according to the following formula:

$$\text{AdBW} = \text{IBW} + 0.4 \times (\text{ABW} - \text{IBW})$$

7. Serum creatinine must be measured within 2 weeks prior to the intended treatment date if this is the first dose of drug. For subsequent treatments and if patient is on active therapy, the serum creatinine must be measured within 48 hours of treatment.

8. Any discrepancies are to be confirmed with the prescriber.

9. Clinical oncology pharmacists of the Dr. H. Bliss Murphy Cancer Center or the inpatient oncology ward are to be contacted if there are any questions or concerns regarding the use of this guideline.

10. All staff responsible for calculating and/or verifying doses of carboplatin must attend an educational session provided by the clinical pharmacists of the Dr. H. Bliss Murphy Cancer Center or the inpatient oncology ward.

#### **References:**

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