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PBMT-GEN-019
ADMINISTRATION OF HIGH DOSE CHEMOTHERAPY -
CYCLOPHOSPHAMIDE (CYTOXAN)

1. PURPOSE
1.1. To outline the procedure required for the safe administration of cyclophosphamide
1.2. To describe the required elements of patient monitoring during and after cyclophosphamide administration.

2. INTRODUCTION
2.1. Cyclophosphamide is an alkylating antineoplastic agent which is chemically related to the nitrogen mustards. It is postulated that the mechanism of cellular toxicity involves cross-linking of cell DNA (deoxyribonucleic acid).
2.2. The onset of antineoplastic and immune and bone marrow suppressive effects occur within 7–21 days.
2.3. Adverse effects include but are not limited to nausea, vomiting, hair loss, immunosuppression, secondary malignancies, cardiomyopathy, myocardial necrosis, dizziness, inappropriate antidiuretic hormone (ADH) secretion, hyperkalemia, pancreatitis, pseudomembranous colitis, hemorrhagic cystitis, bladder cancer, sterility, hepatotoxicity, blurred vision, interstitial pneumonitis, pulmonary fibrosis, cellulitis with extravasation, and hypersensitivity with anaphylaxis.

3. SCOPE AND RESPONSIBILITIES
3.1. Interdisciplinary: Attending physicians, advanced practice providers (APPs), pharmacists and registered nurses (RNs) are all responsible for the contents of this procedure.
   3.1.1. The nurse is responsible for administration of cyclophosphamide, management of side effects and assessment of response.
   3.1.2. The attending physician is responsible for placing chemotherapy order in the medical records.
   3.1.3. The physician and advanced practice providers are responsible for assessment and direction of management of patient.
   3.1.4. The pharmacist is responsible for review of the chemotherapy order and all downstream pharmacy processes in compliance with chemotherapeutic policies and procedures.
3.2. RNs may administer cyclophosphamide after successful completion of the medication administration test, the chemotherapy test, and demonstration of clinical competency with their preceptors.
4. DEFINITIONS/ACRONYMS
   4.1. ADH  Antidiuretic Hormone
   4.2. DNA  Deoxyribonucleic acid
   4.3. PPE  Personal Protective Equipment
   4.4. RN   Registered Nurse

5. MATERIALS
   5.1. See the health-system related policy: *Chemotherapy Administration Policy*.

6. EQUIPMENT
   6.1. See the health-system related policy: *Chemotherapy Administration Policy*.

7. SAFETY
   7.1. Use appropriate Personal Protective Equipment (PPE) when handling chemotherapy. See the health-system related policy: *Chemotherapy Administration Policy*.

8. PROCEDURE
   8.1. See over-arching procedural steps, including steps for patient assessment and chemotherapy administration steps, in the health-system related policy: *Chemotherapy Administration Policy*.
   8.2. Patient assessment will be performed as outlined in the health-system related policy: *Chemotherapy Administration Policy*.
   8.3. Additionally:
       8.3.1. Patient must have a urine specific gravity less than or equal to (≤) 1.010 before administering the first dose of cyclophosphamide.
       8.3.2. Check urine dips for heme with every void and chart accordingly in the medical record. Notify physician or designee for any new heme positive results.
       8.3.3. Monitor urine output, if it is ≤ 2ml/kg/hr over 4hrs notify a provider for management. If there is no urine output in a 4 hour time period the nurse is to encourage the patient to void before notifying a provider.
       8.3.4. Monitor serum chemistries every 12 hours while administering cyclophosphamide this will continue until 24 hours after the completion of cyclophosphamide.
       8.3.5. Ten hours prior to the administration of cyclophosphamide change maintenance IV fluids to D5 ¾NS and increase rate to 2 times maintenance (3000 mL/m2/day). This will continue until 24 hours after the completion of the last dose of cyclophosphamide.
8.3.6. Mesna therapy is initiated at the time of the first dose of cyclophosphamide and continues until 24 hours after the last dose of cyclophosphamide. Mesna is generally given as a 24-hour infusion and protects the bladder wall from irritating cyclophosphamide metabolites.

8.3.7. Administration

8.3.7.1. Chemotherapy administration will be performed as outlined in *Chemotherapy Administration Policy*.

9. RELATED DOCUMENTS/FORMS

9.1. Duke University Health System policy: *Chemotherapy Administration Policy*

10. REFERENCES

10.1. Duke Online Clinical Pharmacology – current version

11. REVISION HISTORY

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<td>08</td>
<td>Sally McCollum</td>
<td>- Section 8.3.1-8.3.3 added to reflect current requirements for urine specific gravity, heme results, and urine output.</td>
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<td>- Section 8.3.4 updated to 12 hours (previously 8 hours)</td>
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**Signature Manifest**

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**Title:** Administration of High Dose Chemotherapy - Cyclophosphamide (Cytoxan)  
**Effective Date:** 24 May 2021

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**PBMT-GEN-019 Administration of High Dose Chemotherapy - Cyclophosphamide (Cytoxan)**

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**Medical Director**

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