

**DukeMedicine****Division of Cellular Therapy****DOCUMENT NUMBER:** ABMT-GEN-027**DOCUMENT TITLE:**

Carmustine Administration

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ABMT-GEN-027

CARMUSTINE ADMINISTRATION

1 PURPOSE

- 1.1 To outline nursing responsibilities with high dose carmustine administration for the inpatient and outpatient Blood and Marrow Transplant Units.

2 INTRODUCTION

- 2.1 Care of the patient receiving chemotherapy medication is highly specialized and requires consistency of practice. This protocol is to ensure the safe administration of this antineoplastic agent. High dose carmustine (BCNU) is given as part of the preparative regimen for stem cell transplantation in order to eradicate unwanted cell populations.
- 2.2 This drug is a nitrosourea chemotherapeutic agent with alkylating properties. Breaks the DNA helix, interfering with DNA replication. Crosses the blood-brain barrier. Carmustine undergoes extensive metabolism in the liver; 60%—70% of the unchanged drug and its metabolites are excreted by the kidneys within 96 hours and 6%—10% is excreted as carbon dioxide by the lungs.

3 SCOPE AND RESPONSIBILITIES

- 3.1 Attending physicians are responsible for prescribing chemotherapy and chemotherapy competent nurses are responsible for administration and monitoring.

4 DEFINITIONS/ACRONYMS

- 4.1 BiCNU®- Carmustine
- 4.2 BCNU- Carmustine
- 4.3 VS- Vital Signs
- 4.4 MAP- Mean Arterial Pressure
- 4.5 CNS- Central Nervous System

5 MATERIALS

- 5.1 Personal Protective Equipment per Safe Handling Guidelines

6 EQUIPMENT

- 6.1 N/A

7 SAFETY

- 7.1 Verify informed consent has been obtained.
- 7.2 Complete ABMT Unit Chemotherapy Checklist.

- 7.3 Dose is calculated based on 40% adjusted ideal body weight.

8 PROCEDURE

- 8.1 Educate patient and caregiver about possible side effects and symptom management strategies
- 8.2 Hydration
 - 8.2.1 Inpatient unit to verify IV hydration is infusing at prescribed rate.
 - 8.2.1.1 Expect order for 1 liter to infuse at 250 ml/hour prior to carmustine administration.
 - 8.2.1.2 Hydration should continue for 24 hours after completion of carmustine infusion.
 - 8.2.2 Outpatient unit to verify IV hydration is infusing at prescribed rate.
 - 8.2.2.1 Expect order for 500 ML NS to infuse at 250 ml/hour pre and post carmustine administration
- 8.3 Verify drug dose calculations and patient identity with second chemotherapy competent RN prior to each dose as per DUH Chemotherapy Administration Protocol.
- 8.4 Verify patency of IV site.
 - 8.4.1 Central line access is required for inpatient and outpatient units
 - 8.4.2 Assess line for blood return.
 - 8.4.3 Use an IV infusion pump to regulate carmustine infusion rate.
- 8.5 Pre-medicate with anti-emetics as ordered.
 - 8.5.1 Outpatient unit will expect an order for oral ondansetron, oral dexamethasone and IV fosaprepitant
- 8.6 Chemotherapy should be delivered to floor primed using low absorbing DEHP-free tubing.
- 8.7 Chemoprotective gloves and a chemoprotective gown must be worn when administering carmustine. For additional information, refer to the DUH chemotherapy Safe Handling and Spill Management of Chemotherapeutic and Biologic Agents Process Standard.
- 8.8 Monitoring for inpatient unit:
 - 8.8.1 Obtain baseline vital signs.
 - 8.8.2 Monitor vital signs q 15 minutes during the infusion. If vital signs stable throughout the infusion (MAP 60), then continue to monitor VS q 1 hour x 2 post infusion.
 - 8.8.3 If MAP < 60 during the infusion, change VS to q 5 minutes and notify Provider. When MAP \geq 60 x 3 then return to q 15 minute VS. When MAP \geq 60 without intervention change to VS q 30 minutes x 2, then q 1 hour x 2.

- 8.8.4 Observe patient closely to ensure patient safety due to the CNS effect of this medication.
- 8.9 Monitoring for outpatient unit:
 - 8.9.1 Obtain baseline vital signs
 - 8.9.2 Monitor vital signs q 1 hour during carmustine infusion until completion
 - 8.9.3 Monitor vital signs q 1 hour x 2 post completion of carmustine
- 8.10 On inpatient unit, if patient becomes hypotensive, notify provider and start normal saline (NS) bolus.
 - 8.10.1 Anticipate order for 1-2 L of NS bolus.
 - 8.10.2 If hypotension persists despite fluid resuscitation, anticipate order for dopamine or phenylephrine infusion.
- 8.11 On outpatient unit, if patient becomes hypotensive, SBP <90, notify provider and start normal saline (NS) bolus per order
 - 8.11.1 Anticipate an order for 1 L NS bolus
 - 8.11.2 If hypotension persists despite fluid resuscitation, contact 9200 inpatient unit for possible hospital admission
- 8.12 If patient becomes restless, agitated or reports pain obtain order for medications to treat if indicated. (NOTE: These medications may increase hypotension in patient.)
 - 8.12.1 Outpatient unit will anticipate an order for IV Ativan X 1 for restless/agitation
 - 8.12.2 If restless/agitation persists after 30 minutes in the outpatient setting, recheck vital signs and notify provider for any additional orders.
- 8.13 Adverse Reactions: Common
 - 8.13.1 Myelosuppression
 - 8.13.2 Alopecia
 - 8.13.3 Severe nausea, vomiting
 - 8.13.4 Mucositis
 - 8.13.5 Flushing
 - 8.13.6 Restlessness and anxiety during infusion
 - 8.13.7 Hypotension inpatient (MAP < 60mmHg), outpatient (SBP<90)
 - 8.13.8 Headache
 - 8.13.9 Jaw discomfort
 - 8.13.10 Chest discomfort
- 8.14 Adverse Reactions: Infrequent/Rare/Unknown
 - 8.14.1 Elevated LFTs

- 8.14.2 Disorientation, ataxia, visual disturbances, severe headache (due to reconstitution in Ethanol base)
- 8.14.3 Diarrhea
- 8.14.4 Pulmonary Toxicity may develop as a late effect (~30-180 days post infusion)
 - 8.14.4.1 Interstitial pneumonitis
 - 8.14.4.2 Pulmonary fibrosis
- 8.15 Document the following:
 - 8.15.1 Patency of IV site/blood return from catheter
 - 8.15.2 Patient's tolerance of carmustine.
 - 8.15.3 Response to interventions to minimize side effects
 - 8.15.4 Patient and caregiver's understanding of expected side effects and symptom management strategies.
 - 8.15.5 Education provided on carmustine administration (outpatient unit)
- 8.16 Reportable Conditions:
 - 8.16.1 Hypotension inpatient (MAP < 60 mmHg), outpatient (SBP<90)
 - 8.16.2 Nausea and vomiting unrelieved by anti-nausea medications.
 - 8.16.3 Restlessness/agitation unrelieved by anxiolytics on outpatient unit
 - 8.16.4 Tachycardia (HR>100 BPM)

9 RELATED DOCUMENTS/FORMS

- 9.1 Outpatient recommendation for exclusion criteria

10 REFERENCES

- 10.1 Clinical Pharmacology. Available via Clinical and Medical Reference Program.
- 10.2 Polovich M, Whitford JM, Olson M, Editors. Chemotherapy and Biotherapy Guidelines and Recommendations for Practice. 3rd Edition © Oncology Nursing Society, Pittsburgh, PA 2009.
- 10.3 Lexicomp Online. Available via Clinical and Medical Reference Program.

11 REVISION HISTORY

Revision No.	Author	Description of Change(s)
03	J. Frith	Added 8.2.2-8.2.2.1 to include outpatient hydration Added 8.4.1 to include central line access requirement Added 8.5.1 to include outpatient antiemetics Added 8.9-8.9.3 to include outpatient monitoring Added 8.11-8.11.2 to include outpatient hypotension parameters and interventions Added 8.12-8.12.2 to include outpatient intervention for

		<p>restlessness/agitation</p> <p>Added 8.13.7 to include outpatient hypotension parameter</p> <p>Added 8.15.5 to include outpatient documentation</p> <p>Added 8.16.1 to include outpatient hypotension parameter</p> <p>Added 8.16.3 to included outpatient reportable condition</p> <p>Added 9.1 to include outpatient recommendation for exclusion criteria</p> <p>8.13 Renamed to Adverse Reactions: Common</p> <p>8.14 Renamed Adverse Reactions: Infrequent, Rare or Unknown</p>
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