**DOCUMENT NUMBER:** PBMT-GEN-042

**DOCUMENT TITLE:**
Infusion of Granulocytes

**DOCUMENT NOTES:**

---

**Document Information**

<table>
<thead>
<tr>
<th>Revision: 07</th>
<th>Vault: PBMT-General-rel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status: Release</td>
<td>Document Type: General</td>
</tr>
</tbody>
</table>

**Date Information**

| Creation Date: 31 Oct 2018 | Release Date: 01 Dec 2018 |
| Effective Date: 01 Dec 2018 | Expiration Date: |

**Control Information**

| Author: MOORE171 | Owner: MOORE171 |
| Previous Number: PBMT-GEN-042 Rev 06 | Change Number: PBMT-CCR-209 |
PBMT-GEN-042
INFUSION OF GRANULOCYTES

1 PURPOSE
1.1 To outline the procedure and nursing responsibilities for administering granulocytes to the pediatric blood and marrow transplant (PBMT) patient.

2 INTRODUCTION
2.1 Granulocytes, a type of blood product, may be indicated in the setting of neutropenia and/or infection and are administered as an action to provide the patient with circulating granulocytes.
2.2 Blood products:
   2.2.1 May be administered to pediatric patients through a central line or peripheral line. If a central line is not available, in pediatrics, a 24 gauge or larger peripheral catheter size is preferred.
   2.2.2 May be infused alone or with normal saline solution.
2.3 Granulocyte Special Precautions:
   2.3.1 ABO incompatible products must be plasma depleted and/or red blood cell (RBC) depleted before administration.
   2.3.2 If possible, avoid transfusions of other bloods products with 4 hours of granulocyte infusions.
   2.3.3 Do not infuse granulocytes within 4 hours (pre and post) of any amphotericin containing product (Amphotericin B, ABLC, and Ambisome).
   2.3.4 Do not infuse granulocytes on pump that has a pumping mechanism that could crush cells (i.e. volumetric pump). Do not use Plum A+ or OMNIFLOW PUMP.
   2.3.5 Granulocytes are NOT compatible with dextrose-containing solutions.
   2.3.6 Infuse over a minimum of 2 hours or per MD instructions.
   2.3.7 Do not leukoreduce!
   2.3.8 All granulocyte products must be irradiated prior to infusion.
      Nursing must verify that the product has an irradiation sticker attached.
   2.3.9 Requires premedication prior to infusion.

3 SCOPE AND RESPONSIBILITIES
3.1 Interdisciplinary: requires an order by an physician or designee in the electronic medical record
3.2 Registered nurses (RNs) may administer granulocytes after successful completion of the blood administration test and demonstration of clinical competency with their preceptor.

3.3 RNs caring for PBMT patients must re-validate their clinical competency to administer granulocytes on an annual basis.

3.4 Other licensed personnel (advanced practice providers or physicians) may administer blood products after demonstration and validation of clinical competency.

4 DEFINITIONS/ACRONYMS

4.1 PBMT Pediatric Blood and Marrow Transplant
4.2 PPE Personal Protective Equipment
4.3 RBC Red Blood Cell
4.4 RN Registered Nurse
4.5 STCL Stem Cell Laboratory
4.6 IV Intravenous

5 MATERIALS

5.1 The Standard 170 or 180μ blood administration set (Micron Filter) should be used for each infusion.

5.2 Normal Saline Flush.

5.3 Gloves (non-sterile).

5.4 Alcohol Pads.

5.5 Granulocytes to infuse by syringe pump as directed by physician.

6 EQUIPMENT

6.1 Must use Alaris syringe pump with Medex 60-inch Extension Set Apv 2.4 mL (product # 5360225).

7 SAFETY

7.1 Personal Protective Equipment (PPE) must be worn when handling any blood products.

8 PROCEDURE

8.1 Patient Assessment

8.1.1 Assess patient for prior infusion reactions. Notify the physician or designee if the patient has a known history of infusion reactions.

8.1.2 Assess the central venous line or peripheral intravenous (IV) site for patency.
8.1.3 Assess and record vital signs pre-administration, 10-20 minutes into infusion, and at completion of infusion.

8.1.4 Observe the patient continuously for the first 5 minutes of infusion and then hourly for signs and symptoms of infusion reaction:

8.1.4.1 fever
8.1.4.2 chills
8.1.4.3 anaphylaxis
8.1.4.4 hypotension
8.1.4.5 tachycardia
8.1.4.6 dark or red urine
8.1.4.7 rash, hives
8.1.4.8 back pain
8.1.4.9 shortness of breath
8.1.4.10 urticaria

8.2 Obtaining and Verifying Blood Products

8.2.1 The Stem Cell Laboratory (STCL) staff person will notify the care nurse that granulocytes are available for infusion. The care nurse will confirm that the patient is able to receive the infusion.

8.2.2 Granulocytes will be transported from the Stem Cell Laboratory to the patient care unit.

8.2.3 Administer pre-medications, if ordered, when granulocytes are available and patient is ready for infusion.

8.2.4 Ensure there are emergency medications available as ordered.

8.2.5 The STCL staff will coordinate delivery of the product to the patient care area.

8.2.6 When granulocytes arrive on the patient care unit, the nurse will verify that the product has been irradiated by checking the sticker on product. If product is NOT irradiated, notify the physician or designee immediately and DO NOT GIVE PRODUCT.

8.2.7 The product should be administered immediately on arrival to the care unit. If the patient is not ready within 10 minutes of product arrival, place the product on the rotator at a speed of 6-8 rotations per minute at room temperature. See related procedure: PBMT-GEN-043 Use of Lab-Line Maxi Rotators.

8.2.8 When ready for infusion, draw product into 1 or 2 of the 60 mL syringes and place in syringe pump with Medex tubing.

8.2.9 Verify all identification information at the bedside by two licensed professionals (one a RN) upon receipt of the product. Verify the following identification information:
8.2.9.1 Patient’s name and medical record number on armband must match the label on the product bag.

8.3 Complete M-03 Infusion Request Form, photocopy and place a copy in medical record file by HUC desk and send a copy to patient’s red chart.

8.4 Special Consideration:
8.4.1 Make every effort to start infusion of the granulocyte products within 30 minutes of receipt of product from the Stem Cell Laboratory.

8.5 Don Gloves.

8.6 Using aseptic technique draw Granulocyte product into a 60 mL syringe connected to bag.

8.7 Prime the tubing.

8.8 Clear the infusion line with Normal Saline.

NOTE: Medications or solutions other than Normal Saline (0.9%) may not be added to blood products or infusion lines.

8.9 Clean the central venous line catheter cap with alcohol prep pad.

8.10 Connect tubing to the patient’s infusion access and administer via syringe pump. DO NOT INFUSE ON PLUM A+ OR OMNIFLOW PUMP.

8.11 Infuse granulocytes cells at a rate specified by the medical order, over no less than 2 hours.

8.12 Record volume of granulocytes transfused on Intake and Output Form.

8.13 All infusions shall be traced from infusion bag to tubing insertion point of catheter to verify correct fluid is infusing into correct port with each bag or tubing change, and with each change in caregiver.

8.14 Flush the patient’s infusion access as per central line or peripheral IV protocol.

8.15 Place empty blood product bags, syringes and tubing in hazardous waste container.

8.16 Patient Monitoring
8.16.1 Follow Duke University Hospital Process Standard for Blood Products Administration.

8.17 Documentation
8.17.1 Document infusion/procedure in the electronic medical record.

8.17.2 Reportable Conditions are listed in Table 1.
### Table 1. List of Reportable Conditions and Corresponding Actions

<table>
<thead>
<tr>
<th>Reportable Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotension</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Anaphylaxis</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Chills</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Temperature Elevation &gt; 1 degree Celsius</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Dark or red urine</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Back pain</td>
<td>STOP THE INFUSION and notify the physician or designee. Administer interventions as ordered.</td>
</tr>
<tr>
<td>Rash</td>
<td>Stop infusion. Contact the physician or designee regarding antihistamine administration.</td>
</tr>
<tr>
<td>Hives (Urticaria)</td>
<td>Stop infusion. Contact the physician or designee regarding antihistamine administration.</td>
</tr>
</tbody>
</table>

### 9 RELATED DOCUMENTS/FORMS

9.1 Hematopoietic Progenitor Cell Infusion Request Form (M-03)
9.2 PBMT-GEN-043 Use of Lab-Line Maxi Rotators

### 10 REFERENCES:

10.1 Accreditation Requirements Manual of the American Association of Blood Banks, Current Edition
10.2 The Duke Hospital Blood Administration Policy
10.3 The AABB Technical Manual, Current Edition

### 11 REVISION HISTORY

<table>
<thead>
<tr>
<th>Revision No.</th>
<th>Author</th>
<th>Description of Change(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>Sally McCollum</td>
<td>Items under Introduction Section regrouped together for better document flow.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acronyms defined throughout.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Epic” changed to electronic medical record for longevity of document.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Table 1 was given a title: List of Reportable Conditions and Corresponding Actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 2.3 additional precaution statement added: If possible, avoid transfusions of other bloods products with 4 hours of granulocyte infusions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 2.3 additional precaution statement added: Requires premedication prior to infusion.</td>
</tr>
<tr>
<td>Revision No.</td>
<td>Author</td>
<td>Description of Change(s)</td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 8.2.7: referred reader to associated procedure - “See related procedure: PBMT-GEN-043 <em>Use of Lab-Line Maxi Rotators.</em>”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 8.2.7 restructured for better flow: The product should be administered immediately on arrival to the care unit. If the patient is not ready within 10 minutes of product arrival, place the product on the rotator at a speed of 6-8 rotations per minute at room temperature. See related procedure: PBMT-GEN-043 <em>Use of Lab-Line Maxi Rotators.</em></td>
</tr>
</tbody>
</table>
**Signature Manifest**

<table>
<thead>
<tr>
<th>Document Number: PBMT-GEN-042</th>
<th>Revision: 07</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Infusion of Granulocytes</td>
<td></td>
</tr>
</tbody>
</table>

*All dates and times are in Eastern Time.*

**PBMT-GEN-042 Infusion of Granulocytes**

**Author**

<table>
<thead>
<tr>
<th>Name/Signature</th>
<th>Title</th>
<th>Date</th>
<th>Meaning/Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sally McCollum (MOORE171)</td>
<td></td>
<td>09 Nov 2018, 11:56:19 AM</td>
<td>Approved</td>
</tr>
</tbody>
</table>

**Medical Director**

<table>
<thead>
<tr>
<th>Name/Signature</th>
<th>Title</th>
<th>Date</th>
<th>Meaning/Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joanne Kurtzberg (KURTZ001)</td>
<td></td>
<td>09 Nov 2018, 10:06:05 PM</td>
<td>Approved</td>
</tr>
</tbody>
</table>

**Quality**

<table>
<thead>
<tr>
<th>Name/Signature</th>
<th>Title</th>
<th>Date</th>
<th>Meaning/Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bing Shen (BS76)</td>
<td></td>
<td>12 Nov 2018, 11:22:06 AM</td>
<td>Approved</td>
</tr>
</tbody>
</table>

**Document Release**

<table>
<thead>
<tr>
<th>Name/Signature</th>
<th>Title</th>
<th>Date</th>
<th>Meaning/Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betsy Jordan (BJ42)</td>
<td></td>
<td>19 Nov 2018, 10:48:29 AM</td>
<td>Approved</td>
</tr>
</tbody>
</table>