# ADULT AND PEDIATRIC BLOOD AND MARROW TRANSPLANT PROGRAM

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APBMT-COMM-014

## DOCUMENT TITLE:
Management of Bleeding in the Adult and Pediatric Blood and Marrow Transplant Patient

## DOCUMENT NOTES:

### Document Information

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APBMT-COMM-014
MANAGEMENT OF BLEEDING IN THE ADULT AND PEDIATRIC BLOOD AND MARROW TRANSPLANT PATIENT

1 PURPOSE
1.1 To outline the care of the adult and pediatric hematopoietic stem cell transplant (HSCT) patient who is at risk for bleeding secondary to thrombocytopenia, graft versus host diseases (GVHD), and/or fragile tissues following administration of chemotherapy and/or irradiation therapy and transplantation.

2 INTRODUCTION
2.1 Thrombocytopenia is a common complication of the stem cell transplant process.
2.2 Multiple factors can lead to thrombocytopenia including but not limited to: chemotherapy, total body irradiation (TBI), medications, GVHD, autoimmune destruction, disseminated intravascular coagulopathy (DIC), and thrombotic thrombocytopenic purpura (TTP), inadequate platelet production, improperly functioning platelets, or excessive loss of platelets.
2.3 Prolonged periods of thrombocytopenia places the patient at increased risk for active bleeding which may require significant treatment interventions such as platelet infusions.

3 SCOPE AND RESPONSIBILITIES
3.1 Interdisciplinary
3.1.1 The physician will provide supportive medical management of the patient.
3.1.2 The nurse will provide supportive care and administer any treatment ordered by the physician or designee.
3.1.3 If blood product treatment is required:
   3.1.3.1 Requires an order placed by a physician or designee in the electronic medical record.
   3.1.3.2 Registered Nurses (RNs) may administer blood products after completing a training course, a blood administration test and demonstration of clinical competency with their preceptor.
   3.1.3.3 RNs must re-validate their clinical competency to administer blood products on an annual basis.
   3.1.3.4 Other licensed personnel (advanced practice providers and physicians) may administer blood products after demonstration and validation of clinical competency.
3.1.4 The Medical Director and Nurse Manager are responsible for ensuring that the requirements of the procedure are successfully met.

4 DEFINITIONS/ACRONYMS

4.1 ABC Automated Blood Count
4.2 CT X-ray computed tomography
4.3 DIC disseminated intravascular coagulopathy
4.4 EEG Electroencephalography
4.5 ENT Ear, nose and throat
4.6 GVHD Graft versus host disease
4.7 HLA Human leukocyte antigen
4.8 HSCT Hematopoietic stem cell transplant
4.9 IM Intramuscular
4.10 IV Intravenous
4.11 IVIG Intravenous immunoglobulin
4.12 LP Lumbar puncture
4.13 MRI Magnetic resonance imaging
4.14 PLT Platelet
4.15 TBI Total body irradiation
4.16 TTP Thrombotic thrombocytopenic purpura

5 MATERIALS

5.1 NA

6 EQUIPMENT

6.1 NA

7 SAFETY

7.1 NA

8 PROCEDURE

8.1 Assessment:

8.1.1 Monitor Automated Blood Counts (ABC) and coagulation studies as ordered
8.1.2 Observe patient for signs of unusual bleeding: blood in bodily secretions, bruising, hematoma, petechiae, and blood in urine, stool (diapers or pull-ups)

8.2 Safety-Preventive Measures:
8.2.1 Avoid intramuscular (IM) injections
8.2.2 Avoid rectal temperatures, enemas, or suppositories or other manipulations
8.2.3 Implement measures to minimize nausea and vomiting
8.2.4 Implement measures to prevent and treat constipation or diarrhea
8.2.5 Provide assistance with ambulation as needed
8.2.6 Maximize the use of slippers or shoes when the patient is out of bed
8.2.7 Minimize risk for falls
8.2.8 Prohibit blade razor use by thrombocytopenic patients
8.2.9 Assist patient to trim nails, using caution to minimize risk of injury
8.2.10 Provide soft toothbrushes or toothettes for patient use
8.2.11 Use protective gear in toddlers (e.g. helmets, knee pads, crib bumpers)
8.2.12 Apply direct pressure to all sites of invasive procedures for 5-10 minutes, and then apply pressure dressing. Observe site frequently for excessive bleeding
8.2.12.1 Topical thrombin or surgicel or other topical clotting agents may be needed at the site

8.3 Patient Teaching:
8.3.1 Instruct patient to use soft toothbrush, toothettes, soft gauze, or rinsing for mouth care.
8.3.2 Instruct patient to use electric razor only.
8.3.3 Instruct patient to avoid scratching or rubbing skin.
8.3.4 Instruct patient to avoid bending over with head lower than shoulders.
8.3.5 Instruct patient to avoid nose blowing if possible. Encourage gentle blowing, sneezing, or coughing.
8.3.6 Avoid jumping, diving, contact sports, biking, roller blading, etc.

8.4 Blood Product Administration:
8.4.1 See related policies:
8.4.1.1 DUH Policy: Blood Product Administration Policy
8.4.1.2 PBMT-GEN-041 Infusion of Platelets
8.4.1.3 PBMT-GEN-039 Continuous Platelet Infusion
8.4.2 Follow Duke Hospital Process Standards Blood Products Administration procedure when administering any blood product.

8.4.3 Administer blood products as needed to maintain hematocrit and platelet (PLT) at levels ordered by physician.

8.4.3.1 Administer only leuko-depleted, irradiated blood products.

8.4.4 Anticipate need to administer platelets before and during invasive procedures.

8.4.5 Check human leukocyte antigen (HLA) antibodies per order. If antibodies are positive and patient is becoming refractory to platelets, discuss with physician the possible need for HLA-matched platelets and/or intravenous immunoglobulin (IVIG) therapy.

8.4.6 Pre-medicate with acetaminophen and diphenhydramine prior to blood product administration, if indicated and ordered.

8.4.7 Administer platelets per institutional policy and include the following guidance:

8.4.7.1 Obtain post-platelet transfusion count 30-60 minutes after transfusion is completed if indicated.

8.4.7.2 Transfuse volume reduced products to patients less than (<) 10 kg.

8.4.7.3 Transfusion parameters may be individualize for clinical status and situations (i.e. active bleeding, high risk procedures).

8.5 Nosebleed:

8.5.1 Apply pressure for 5-10 minutes.

8.5.2 Apply ice packs to nasal area.

8.5.3 Administer platelets as indicated.

8.5.4 Anticipate consultation with ENT service for continued bleeding.

8.5.5 Consider topical thrombin or other interventions per standard of care.

8.6 Cranial:

8.6.1 Perform frequent neurological assessments.

8.6.2 Implement measures to minimize nausea, vomiting, or constipation.

8.6.3 Avoid placing patient in Trendelenberg position.

8.6.4 Anticipate order for imaging studies (CT, MRI), EEG, LP, and consultation with Neurology Service for evaluation of altered neurological function.

8.7 Hemorrhagic Cystitis:

8.7.1 Monitor urinary output and assess for presence of blood in urine.
8.7.2 Maintain adequate intravenous (IV) hydration.

8.7.3 For Pediatrics: Anticipate additional orders such as continuous bladder irrigation, aminocaproic acid (Amicar) or conjugated estrogens (Premarin) for patient with hematuria.

8.7.4 For Adults: Anticipate additional orders for continuous bladder irrigation for patient with hematuria.

8.7.4.1 Refer to Duke Hospital Process Standards procedure for Continuous Bladder Irrigation.

8.7.5 Consider antimicrobial therapy, depending on an etiology, including but not limited to ciprofloxacin, CMX001, cidofovir, or other relevant agent.

8.8 Menstrual Bleeding:

8.8.1 Perform perineal pad count.

8.8.2 Anticipate order for hormone therapy for patient with significant or prolonged vaginal bleeding.

8.9 Active Bleeding:

8.9.1 Place patient on bedside monitor for frequent vital sign monitoring.

8.9.2 Obtain orthostatic vital signs if possible. An orthostatic systolic decrease of 10-20 mmHg or increase in pulse of 15 beats/minute is considered to be significant.

8.9.3 Apply direct pressure or pressure dressings as necessary.

8.9.4 * Anticipate order for increased frequency of ABC and coags.

8.9.5 * Administer crystalloid bolus and blood products as ordered.

8.9.6 * Anticipate order to increase threshold for platelet transfusion.

8.9.7 * Anticipate order for aminocaproic acid (Amicar) infusion, particularly with diffuse alveolar hemorrhage.

8.9.8 * Anticipate possible consultation with Pulmonary or Gastrointestinal Service for endoscopic evaluation of bleeding source.

8.9.9 * Anticipate possible consultation with Coagulation Service for refractory bleeding.

8.9.10 * Vasopressor infusion should not be initiated until intravascular space is adequately replenished.

8.10 Reportable Conditions:

8.10.1 Heart Rate greater than (>) 120 beats per minute (or as indicated for age)

8.10.2 Systolic Blood Pressure less than (<) 90 (or as indicated for age)

8.10.3 Mean Arterial Pressure less than (<) 60 (or as indicated for age)
8.10.4 Orthostatic changes
8.10.5 Active, unusual, or uncontrolled bleeding
8.10.6 Platelet count less than (<) 10K despite platelet transfusion
8.10.7 Decreasing hematocrit
8.10.8 Mental Status Changes

9 RELATED DOCUMENTS/FORMS
9.1 DUH Policy: Blood Product Administration Policy
9.2 PBMT-GEN-041 Infusion of Platelets
9.3 PBMT-GEN-039 Continuous Platelet Infusion

10 REFERENCES

11 REVISION HISTORY

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<td>Sally McCollum</td>
<td>Introduction and Scope section - reformatted to align with similar SOPs.</td>
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<td>Section 8 and Section 9 - added Related polices.</td>
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<td>Section 8.4.7 - updated to reflect parameters may be individualized based on clinical status.</td>
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<td>Section 8.10. - added “or as indicated by age” where applicable.</td>
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**APBMT-COMM-014 Management of Bleeding in the Adult and Pediatric Blood and Marrow Transplant Patient**

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