ADULT AND PEDIATRIC BLOOD AND MARROW TRANSPLANT PROGRAM

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

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APBMT-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, GVHD, and/or fragile tissues following administration of chemo/irradiation therapy and transplantation.

2 INTRODUCTION

2.1 Level: Interdependent (* requires an order from physician or physician designee).

2.2 Supportive Data: Thrombocytopenia is a common complication of the stem cell transplant process. Chemotherapy, TBI, medications, GVHD, autoimmune destruction, DIC, and TTP can all result in thrombocytopenia. Other possible causes of thrombocytopenia include inadequate platelet production, improperly functioning platelets, or excessive loss of platelets. This prolonged period of thrombocytopenia places the patient at increased risk for active bleeding.

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.

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 surgicele 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 Administer blood products as needed to maintain hematocrit and platelet (PLT) at levels ordered by physician. Administer only leuko-depleted, irradiated blood products.

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

8.4.3 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.

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

8.4.5 Follow Duke Hospital Process Standards Blood Products Administration procedure when administering blood products.

8.4.6 Administer platelets per institutional policy.

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

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

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
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 NA

10 REFERENCES

11 REVISION HISTORY

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<td>04</td>
<td>Sally McCollum</td>
<td>Defined acronyms</td>
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<td>Section 8.2: removed reference to use of protective gear in toddlers as protective gear is no longer allowed per hospital policy.</td>
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**Signature Manifest**

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**APBMT-COMM-014 Management of Bleeding in the Adult and Pediatric Blood and Marrow Transplant Patient**

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