ADULT AND PEDIATRIC BLOOD AND MARROW TRANSPLANT PROGRAM

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1 PURPOSE

1.1 To define the steps for donor selection, procurement, workup, evaluation and clearance for donation of various related and unrelated, allogeneic and autologous cellular products (stem and progenitor cells from mobilized peripheral blood or bone marrow, Donor Lymphocyte Infusions (DLI), Natural Killer (NK) Cell, directed and unrelated donor umbilical cord blood, and directed donor granulocytes) to Adult and Pediatric patients in need of hematopoietic stem cell transplantation (HSCT) and supportive care.

2 INTRODUCTION

2.1 Donor Identification and Selection

2.1.1 Adult and Pediatric patients undergoing HSCT are affected with a variety of diagnoses which can be treated with a variety of types of transplantation therapy. Allogeneic transplants are performed in both adult and pediatric populations. Autologous cells obtained from bone marrow (BM) or peripheral blood progenitor or stem or mononuclear cells (PBPC, PBSC or PBMC) are also used to facilitate marrow rescue after high dose chemotherapy in patients with certain high risk hematologic malignancies or recurrent solid tumors. Cell products from related donors are used as indicated by medical practice under 21 CFR 1271 and Public Health Service Act section 361. More than minimally manipulated cells from unrelated donors including, but not limited to, DLI, ALDHbr, CD34, may be used under IND per FDA 21 CFR 1271, 361. Cells for transplantation are obtained from related or unrelated donor bone marrow, mobilized peripheral blood, or umbilical cord blood (UCB). Unrelated donor products are obtained through the National Marrow Donor Program (NMDP), Be the Match Registry. In addition, granulocytes, donor leukocytes for DLI, NK cells, and others may be utilized in the peri-transplant period to enhance protection against opportunistic pathogens or graft versus tumor effects. The ultimate choice of treatment protocol and donor source is determined by the multidisciplinary Blood and Marrow Transplant (BMT) care team lead by the patient’s primary physician.

2.1.2 Both allogeneic and autologous donors must be cleared by medical personnel to undergo a bone marrow harvest or PBPC collection procedure. BM harvests are performed under general or spinal anesthesia in an appropriate, age specific operating room. Stem cells, granulocytes, DLI, NK cells, and other mononuclear cell donations are performed via apheresis which is conducted by teams consisting of a physician, clinicians, Registered Nurse (RN), and other allied staff. Pediatric apheresis is performed in the Children’s Health Center (CHC) Pediatric BMT Clinic treatment room, while adult products are collected in the North Pavilion Adult BMT Clinic.
2.1.3 Unrelated adult donors are tentatively scheduled for BM or PBSC harvest prior to evaluation. If subsequent donor eligibility and medical clearance evaluation yields positive results, the harvest is cancelled. Both PBPC and BM donors are utilized depending on the needs of the patient or study protocol designation. Unrelated umbilical cord blood donors are also obtained and evaluated through the NMDP. High resolution human leukocyte antigen (HLA) typing is obtained at a minimum of 1 time from both prospective donors and the patient from an American Society of Histocompatibility Immunogenetics (ASHI) certified laboratory. High resolution HLA-typing is performed and utilized for final donor selection. Confirmatory HLA typing is performed for all donors and patients so that each pair is typed twice and a minimum of one of the typings is at high resolution. Typing includes at a minimum HLA-A, B, C, and DRB1 type for all allogeneic donors.

3 SCOPE AND RESPONSIBILITIES

3.1 Physicians, Nurse Coordinator/Clinicians, RN Staff, Advance Practice Providers including Physician Assistants (PA) and Nurse Practitioners (NP), Research Coordinators, and Medical Technologist/Clinical Laboratory staff are required to follow these guidelines.

3.2 Allogeneic donor suitability for related donors is evaluated by a physician or extender who is not the primary transplant physician overseeing care of the recipient.

4 DEFINITIONS/ACRONYMS

4.1 ABMT Adult Blood and Marrow Transplant
4.2 ALDHbr Aldehyde dehydrogenase bright cells
4.3 APBMT Adult and Pediatric Blood and Marrow Transplant
4.4 ASHI American Society of Histocompatibility Immunogenetics
4.5 BM Bone Marrow
4.6 BMH Bone Marrow Harvest
4.7 BMT Blood and Marrow Transplant
4.8 CBC/diff Complete Blood Count with Differential
4.9 CD34 CD-34 antigen on white blood cells
4.10 CFR Code of Federal Regulation
4.11 CLIA Clinical Laboratory Improvement Amendments
4.12 CMP Complete Metabolic Profile
4.13 CMV Cytomegalovirus
4.14 CVC Central Venous Catheter
4.15 DLI Donor Lymphocyte infusion
4.16 EKG Electrocardiogram
4.17 FACT Foundation for the Accreditation of Cellular Therapy
4.18 FDA Food and Drug Administration
4.19 FNP Family Nurse Practitioner
4.20 G-CSF Granulocyte-colony-stimulating factor
4.21 H&P History and Physical
4.22 HLA Human leukocyte antigen
4.23 HSCT Hematopoietic Stem Cell Transplant
4.24 IND Investigational New Drug
4.25 IV Intravenous
4.26 MD Medical Doctor
4.27 Mg Magnesium
4.28 NK Natural killer cells
4.29 NIH National Institute of Health
4.30 NMDP National Marrow Donor Program
4.31 NP Nurse Practitioner
4.32 PA Physician Assistant
4.33 PBMC Peripheral Blood Mononuclear Cells
4.34 PBMT Pediatric Blood and Marrow Transplant
4.35 PBPC Peripheral Blood Progenitor Cells
4.36 PBSC Peripheral Blood Stem Cell
4.37 RN Registered Nurse
4.38 STCL Stem Cell Laboratory
4.39 UCB Umbilical Cord Blood

5 MATERIALS
5.1 NA

6 EQUIPMENT
6.1 NA

7 SAFETY
7.1 NA
8 PROCEDURE

8.1 Donor Selection

8.1.1 Patients are evaluated to determine whether they are candidates for autologous or allogeneic transplantation and, within each category, which type of cellular graft is their best option.

8.1.1.1 When allogeneic donors are utilized, both related and unrelated donor options are evaluated.

8.1.1.1.1 Based on the patient’s diagnosis, disease state, and co-morbidities, the best available donor for their condition and medical situation is selected.

8.1.1.1.2 Age appropriate considerations will be applied to minor (≤ 18 years of age) and older (≥ 60 years of age) donors.

8.1.1.1.3 Minor donors (≤ 18 years of age) will be harvested by the PBMT team utilizing standard of care screening, sedation, general anesthesia - if indicated (delivered by pediatric anesthesiologists), line placement - if indicated (by pediatric surgeons or interventional radiologists), nurses, and physicians.

- The weight, hemoglobin and iron status of the minor donor will be assessed prior to harvest to determine whether intraoperative transfusion or priming of thepheresis device will be necessary before or during the procedure.
- If RBC transfusion is required, attempts for autologous or family donation will be executed.
- Iron therapy will be administered before or after the harvest as indicated by blood count and indices.

8.1.1.1.4 Older pediatric donors (defined as donors >18 years of age donating to a pediatric patient) will be managed by the PBMT team with consultations with the adult service as needed. They will undergo a medical history and physical examination by a Family Nurse Practitioner (FNP) employed by the PBMT program and supervised by a PBMT attending physician. This FNP/attending physician team will determine if such consultation is needed.
• The need for line placement, transfusion, autologous blood donation, iron therapy, Vitamin K therapy, etc., and follow up will be assessed by and provided by the PBMT team.

8.1.1.5 For allogeneic donors, whether related or unrelated, the clinical team should determine the number of cellular therapy donations permitted by the individual donor. Medical comorbidities, peripheral blood counts and iron status will be considered in the decision making process for multiple donations.

8.1.2 Unrelated allogeneic donors are evaluated by the registry that is facilitating donation for transplantation. Related allogeneic donors are evaluated by the ABMT or PBMT program. These allogeneic donors are evaluated through donor screening questionnaires and donor testing for risk factors that might result in disease transmission from cellular therapy products. Unrelated and related allogeneic donor selection will include a medical history including vaccination, travel, and blood transfusion histories, exam, medical record review, donor screening labs and other appropriate age related testing. Examples may include, but are not limited, to Electrocardiogram (EKG) and Human chorionic gonadotropin (HCG). Allogeneic donor eligibility shall be confirmed and documented in the recipient’s medical records before the recipient’s preparative regimen is initiated and before the allogeneic donor begins mobilization regimen, if indicated. The clinical program is responsible for informing the collection facility and processing facility (as applicable) of donor test results or if any testing which was not performed.

If a matched related or unrelated donor is not available, a mismatched related (Haplo-identical) or mismatched unrelated or cord blood donors units are evaluated for use.

8.1.2.2 If the patient has a history of alloimmunization, an anti-HLA antibody screen (PRA) will be obtained. If anti-HLA antibodies are present, every effort will be made to select a donor who is negative for these antigens/alleles. If this is not possible, a desensitization program will be considered prior to or as part of cytoreduction.

8.1.2.1 If a cord blood donor is utilized, units under consideration for selection will be HLA typed utilizing an attached segment to the cryopreservation bag in which the unit was banked. If a segment is not available, the unit will not be selected for the patient.
8.1.2.1 The use of an ineligible unrelated or related allogeneic donor, or allogeneic donor for whom donor eligibility determination is incomplete, requires documentation of the rationale for the donor’s selection and suitability by the transplant physician, documentation of urgent medical need, and documentation of the informed consent of the donor and the recipient. See Donor Consent Section below for consenting processes of the ineligible donor.

8.1.2.2 For related and unrelated donors used for transplantation to patients at Duke, the clinical program will confirm clinically significant findings and will report such findings to the prospective donor and make recommendations for follow-up. Each of these will be documented in the medical record.

8.1.2.3 At the discretion of the physician, there may be scenarios where the physician deems donor ineligibility notification of the donor or the recipient is not necessary. At such time, this will be documented accordingly. For unrelated donors harvested at Duke for the NMDP, results of positive donor screening tests will be provided to the NMDP who will inform the donor and prospective recipient as indicated.

8.1.3 In the event that there are two or more suitable donors, the attending physician will determine which donor will be selected. This will be based on the medical condition of the recipient and considering all other aspects of the donor availability and findings of the donor work-up.

8.1.4 Donor Advocates

8.1.4.1 Donors will be assigned a donor advocate whose primary obligation is to help the donor understand the risks and benefits of donation and promotes the interest, well-being, and safety of the donor.

8.1.4.2 In accordance with the Donor Registries for BMT, Technology Assessment (NIH Office of Medical Applications of Research, 1985) the role of the advocate is to:

8.1.4.2.1 Help ensure that the donor consent is made without time pressure and with full information

8.1.4.2.2 Enhance the personal attention given to the donor during procedures

8.1.4.2.3 Help prevent unnecessary inefficiencies and discomfort

8.1.4.2.4 Mobilize official expressions of gratitude after the donation

8.1.4.2.5 Aid in the resolution of subsequent problems
8.1.4.3 For donors who are mentally incapacitated or not capable of full consent, including minors, a donor advocate will be utilized to appropriately counsel the donors and protect them from unsafe or futile donation procedures.

8.1.4.4 Allogeneic donors who are minor or who are mentally incapacitated will have their best interest represented by a parent/legally authorized representative or another authorized medical decision-maker for that donor. For these individuals, donor advocates will be available if concerns are raised regarding whether the best interests of these individuals are being adequately protected.

8.1.4.5 The donor advocacy role will be documented and should not be fulfilled by an individual involved in the recipient’s care.

8.1.4.6 Donor advocates in the PBMT program will be either the social worker or another provider not involved in the recipient’s care.

8.1.4.7 Donor advocates in the ABMT program will be either the social worker or another provider not involved in the recipient’s care.

8.1.4.8 For related donors, the medical assessment for donor will be conducted by a physician or mid-level practitioner who is not the primary caretaker of the recipient.

8.1.5 Donor Consent

8.1.5.1 Donors are consented a single time with a donation consent for their entire course of donations.

8.1.5.1.1 Before signing the written consent, the donors undergo an educational session with the nurse/transplant coordinator to review the details of the procedure, line placement (if applicable), growth factor administration (if applicable), expected complications, and the potential risks and benefits. These educational sessions are explained in terms the donor can understand.

8.1.5.1.2 Allogeneic donors are informed they have the right to refuse donation or to withdraw consent. The donor will be informed of the potential consequences to the recipient in the event consent is withdrawn after the recipient has begun his/her preparative regimen.

8.1.5.2 The use of an ineligible allogeneic or autologous donor shall require written informed consent of the donor, if available, and the recipient. In limited scenarios and at the discretion of the attending physician, there may be situations in which
consent may not be obtained as determined either by medical significance or otherwise. See APBMT-COMM-001 FRM1 Emergency Release of Cellular Product for consenting the recipient to receive an HSCT product from an ineligible donor.

8.1.5.3 All written informed consents are obtained by the donor’s physician and copies provided to the collection facility prior to the collection.

8.1.5.4 A copy of the consent is sent to Medical Records within Duke University Health Systems.

8.1.6 Records required for donor selection and eligibility determination will be in English or translated into English when crossing international borders.

8.1.7 Information regarding the donation process will be provided to the potential donor prior to HLA typing.

8.2 Donor Evaluation

8.2.1 One or more clinic visits will be arranged for donor evaluation for HSCT. The transplant coordinator will coordinate the donor workup concomitant with the patient’s pre-transplant workup.

8.2.2 During these clinic visits, the donor will have a physical examination, which will be performed by a physician or physician extender that is not the primary transplant physician/provider overseeing care of the recipient.

8.2.2.1 This includes assessment for signs of IV drug abuse, heart disease, coagulation problems, hypertension or any factors in the medical history that would exclude the donor from eligibility per FDA donor regulations (1271).

8.2.2.2 Laboratory tests including screening blood counts, chemistry panels, coagulation factors, pregnancy status (if the donor is a female of childbearing age), and ABO and Rh type/Type and Screen (which includes red cell antibody) are performed on all potential donors. HLA-typing is obtained on all allogeneic donors. Anti-HLA antibody is performed on mismatched allogeneic donors and recipients. Anti-HLA antibody may be performed on other donors on an as needed basis. Infectious disease screening is performed at a Clinical Laboratory Improvement Amendments (CLIA) certified laboratory for donor screening as outlined below using FDA approved or cleared donor screening kits. The donor will be evaluated for the risk of hemoglobinopathy and if indicated a hemoglobin electrophoresis will be performed prior to the administration of the mobilization agents. A pregnancy test is performed in females of child bearing age within seven (7) days prior to starting the donor mobilization regimen and, as applicable, within seven (7) days prior to initiation of
recipient’s conditioning regimen. Exempt from the pregnancy testing are females: who have had a hysterectomy, are over the age of 55, who are age 50 or greater with 12 months since last menses, who are age 45 or greater with 18 months since last menses. The pregnancy assessment (if testing is not indicated) will be addressed in the physician note.

8.2.2.3 All evaluations are performed in a private clinic examination/consultation room where confidentiality can be maintained. Donor evaluation information will be documented on the Duke Hospital Universal H&P Form or related document. Adult BMT Clinic Notes are located in the electronic medical record. Pediatric notes are located in the PBMT database.

8.2.2.4 The donor, or parent/legally authorized representative of-in the case of a child < 18 years will be given the donor education materials APBMT-COMM-007 Important Information You Must Know for Donations to Stem Cell Transplant Patients, and either PBMT-COLL-001 Pediatric Donor History Questionnaire or APBMT-COMM-002 Adult Donor History Questionnaire to complete. The donor can complete this independently, and return it to the Transplant Coordinator /Clinician. [NOTE: The sensitive questions about sexual activity have been removed from the Pediatric form. The Pediatric Nurse Coordinator will determine whether pediatric patients between 12-18 years of age should complete the pediatric or adult form.] Assistance in completing the Donor Health History Questionnaire will be provided if needed.

8.2.2.5 Current medications, blood transfusion history, vaccination history, and travel history will specifically be reviewed and recorded. Any high risk behaviors will be reviewed.

8.2.2.6 The completed form will be signed and original sent to Stem Cell Laboratory (STCL) to file in laboratory file, a copy is filed in the donor section of the transplant recipient’s shadow chart and a copy is sent to Duke Medical Records. The completed Donor Health History Questionnaire will be reviewed by the donor’s transplant coordinator or the person performing the donor history and physical examination to identify any exceptions for donation (e.g., questions that are answered “yes”). Unexpected responses or “yes” questions will be explained in the remarks section of the questionnaire (e.g., travel outside the U.S., query where? etc.). After obtaining this additional information, any exceptions or answered questions indicating an increased risk of infectious disease transmission to the recipient, the physician will address the risks and benefits. If the physician deems that
the donation should occur despite the exception, he/she will document this on the questionnaire (pediatrics only), in the donor’s medical record, and complete the Emergency/Exceptional Release section of the program-specific form either APBMT-COMM-001 FRM2 Summary of Donor Eligibility and Infectious Disease Testing (PBMT) or APBMT-COMM-001 FRM3 Summary of Donor Eligibility and Infectious Disease Testing (ABMT). If the physician deems that the donation should not occur, the donation will be cancelled and the donor will be informed of this decision.

8.2.2.7 Any exceptions to donation will be documented prior to the donation on the APBMT-COMM-002 Adult Donor History Questionnaire or PBMT-COLL-001 Pediatric Donor History Questionnaire and the program-specific form, either APBMT-COMM-001 FRM2 Summary of Donor Eligibility and Infectious Disease Testing (PBMT) or APBMT-COMM-001 FRM3 Summary of Donor Eligibility and Infectious Disease Testing (ABMT), including Section A: Infectious Disease Testing; Section B: Donor Eligibility Requirements; Section C: Emergency/Exceptional Release. These completed forms, signed by the physician, will be placed in the donor chart and available for review by the clinical staff as needed. The Emergency/Exceptional Release will cover the entire donation period of 30 days for peripheral blood stem cells (PBSC), bone marrow (BM), and dedicated Granulocyte donations, or 7 days for DLI and NK Cell donations, unless there is a change in donor status.

8.2.2.8 If a donor is donating multiple times or if more than 30 days elapse from the initial donor qualification and the day of the actual donation, the PBMT nurse coordinator, ABMT donor transplant coordinator, and/or apheresis nurse will re-administer and update the health history questionnaire. The same procedure for reviewing and noting exceptions applies to each administration of the questionnaire.

8.2.2.9 For donors, infectious disease testing will be completed within 30 days for PBSC, bone marrow, and dedicated granulocyte donors, and within 7 days for DLI or NK Cell donations per FDA and FACT requirements. The results of FDA and eligibility required testing will be documented on the program-specific form either APBMT-COMM-001 FRM2 Summary of Donor Eligibility and Infectious Disease Testing (PBMT) or APBMT-COMM-001 FRM3 Summary of Donor Eligibility and Infectious Disease Testing (ABMT). The original Summary of Donor Eligibility form will accompany each collected product to the STCL.
8.2.3 Routine labs for the APBMT, including chemistry panels (CMP) and blood count and differential (CBC/diff), which will be tested within 24 hours of the first collection or more often if clinically indicated, and reviewed by the Nurse Clinician. In addition, pediatric BMT test coagulation factors and adult BMT test Magnesium (Mg) level. If any results are out of the normal range, the result will be reviewed by the donor’s physician and appropriate therapy will be prescribed.

8.2.3.1 Allogeneic donors may be pretreated with therapeutic iron and/or vitamin K. For the PBMT program when possible, allogeneic donors donate an autologous unit of PRBCs in advance of bone marrow harvest procedures.

8.2.4 Donors of PBPC or granulocytes to pediatric patients may have a central venous apheresis catheter (CVC) placed prior to their donations. Adult autologous donors may require a CVC if transitioning to transplant after collection. Adult allogeneic donors require a CVC only if peripheral access is unsuccessful.

8.2.5 Allogeneic donors may be mobilized with granulocyte-colony-stimulating factor (G-CSF) depending on type of collection requested. Mobilization for autologous stem cell donations includes G-CSF +/- chemotherapy and if indicated, Plerixafor (Mozibil) may also be used. The readiness parameter for stem cell apheresis is determined by quantitation of the CD-34+ cells per microliter in the peripheral blood. This parameter is not used for granulocyte, DL1 or NK cell donors. All quantitative cellular targets and endpoints are based on the type of apheresis procedure, apheresis volume, total cells counts, and protocols/treatment requirements. Quantitative targets and endpoints for stem cell collection are expressed as required CD-34+ cells per kilogram of the recipient’s body weight.

8.3 Donor Test Requirements

8.3.1 Testing for infectious disease is performed per FDA and FACT requirements. Donors donating over a time period in excess of 30 days will have these tests repeated. Unrelated cord blood donors are tested by the cord blood bank at the time of procurement of the cord blood donation. This information is provided to the transplant center through the NMDP data systems. Allogeneic donors and allogeneic recipients shall be tested for ABO group and Rh type/Type and Screen (which includes red cell antibody) using two independently collected samples. If discrepancies are noted, another ABO group and Rh type/Type and Screen will be drawn from donor/patient. Discrepancies will be resolved and documented in donor/patient’s EMR prior to issue of the cellular therapy product. Two independently collected ABO/Rh or Type and Screen samples are obtained from autologous donors prior to issue of cellular therapy product.
8.3.1.1 The testing panel for autologous and allogeneic adult donors and pediatric donors greater than (>6) 6 months of age not on IVIG supplementation (within 6 months) of the donation is listed below. Additional testing may be performed as required to assess the possibility of transmission of other infectious and non-infectious diseases.

8.3.1.1.1 Hepatitis B Surface Antigen (HBs-Ag)
8.3.1.1.2 Hepatitis B Core Antibody (HBc-Ab)
8.3.1.1.3 Hepatitis C Virus Antibody (HCV-Ab)
8.3.1.1.4 Treponema pallidum (syphilis) Antibody Screen
8.3.1.1.5 Cytomegalovirus CMV Total Antibody
8.3.1.1.6 HIV1/0/2 Antibody test (Anti HIV to 1/0/2)
8.3.1.1.7 HIV/HCV/HBV NAT
8.3.1.1.8 HTLV I/II/ Antibody Qualitative (HTLV I/II)
8.3.1.1.9 Zika Virus NAT
8.3.1.1.10 West Nile Virus NAT (WNV)
8.3.1.1.11 Trypanosoma cruzi (Chagas) Antibody

8.3.2 For patients on IVIG or infants ≤ 6 months of age and/or on IVIG, the following panel below is substituted. Additional testing may be performed as required to assess the possibility of transmission of other infectious and non-infectious diseases.

8.3.2.1 Hepatitis B Surface Antigen (HBs-Ag)
8.3.2.2 Treponema pallidum (syphilis) Antibody Screen
8.3.2.3 HIV/HCV/HBV NAT
8.3.2.4 Zika Virus NAT
8.3.2.5 West Nile Virus NAT (WNV)

8.3.3 Additional, patient specific testing may be required. Note that the testing listed below may NOT be required for all donors.

8.3.3.1 Donor in Adult BMT

8.3.3.1.1 Toxoplasma gondii IgG Antibody
8.3.3.1.2 Toxoplasma gondii IgM Antibody
8.3.3.1.3 Draw only if IgG is positive
8.3.3.1.4 EBV IgG, EBV IgM, EBV EBNA, and EBV EA IgG Antibodies
8.3.3.1.5 Herpes Simplex IgG Antibody
8.3.3.1.6 Varicella-Zoster IgG Antibody
8.3.3.1.7  CMV DNA (PCR, quantitative; if CMV is positive)
8.3.3.1.8  Type and Screen/Blood Type (ABO/Rh)
8.3.3.1.9  Includes Red Blood Cell Antibody drawn on all donors/recipients
8.3.3.1.10 Anti-HLA Antibody Screen
8.3.3.1.11 Serum Protein Electrophoresis Panel (SPEP)
8.3.3.1.12 Hepatitis B Surface Antibody
8.3.3.1.13 Hepatitis A IgM Antibody
8.3.3.1.14 HGB Electrophoresis Panel (HEP)
8.3.3.1.15 Draw if donor or recipient is positive
8.3.3.1.16 HLA Class I High Resolution Typing
8.3.3.1.17 HLA Class II High Resolution Typing

8.3.4  Donor in Pediatric BMT ≥ 6 month of age
8.3.4.1  Toxoplasma gondii IgG Antibody
8.3.4.2  Toxoplasma gondii IgM Antibody
8.3.4.3  EBV IgG, EBV IgM, EBV EBNA, and EBV EA IgG Antibodies
8.3.4.4  Herpes Simplex IgG Antibody
8.3.4.5  Varicella Zoster IgG Antibody
8.3.4.6  CMV DNA (PCR, quantitative)
8.3.4.7  Type and Screen/Blood Type (ABO/Rh)
8.3.4.8  Includes Red Blood Cell Antibody drawn on all donors/recipients
8.3.4.9  Anti-HLA Antibody Screen
8.3.4.10 HGB Electrophoresis Panel (HEP)
8.3.4.11 Draw if donor or recipient is positive
8.3.4.12 HLA Class I High Resolution Typing
8.3.4.13 HLA Class II High Resolution Typing

8.3.5  Donor in Pediatric BMT < 6 month of age or having received IVIG
8.3.5.1  EBV (PCR, quantitative)
8.3.5.2  CMV (PCR, quantitative)
8.3.5.3  Type and Screen/Blood Type (ABO/Rh)
8.3.5.4  Includes Red Blood Cell Antibody drawn on all donors/recipients
8.3.5.5 Anti-HLA Antibody Screen
8.3.5.6 HGB Electrophoresis Panel (HEP)
8.3.5.7 Draw if donor or recipient is positive
8.3.5.8 HLA Class I High Resolution Typing
8.3.5.9 HLA Class II High Resolution Typing

8.4 Donor Clearance

8.4.1 BM and PBSC, donors must be cleared or evaluated for the following:
8.4.1.1 Infectious diseases testing must be negative or, if positive, cleared by the donor’s physician
8.4.1.2 General anesthesia and marrow donation, if applicable
8.4.1.3 Apheresis procedure(s), if applicable
8.4.1.4 Evaluation of vaccination history
8.4.1.5 Evaluation of travel history
8.4.1.6 Not currently pregnant
8.4.1.7 Adequate venous access or CVC placed, if indicated

8.4.2 Growth factor administration
8.4.2.1 For female donors of child-bearing capacity and not currently pregnant, a documented negative pregnancy test within 7 days of beginning growth factors must be obtained.

8.4.3 Other donor considerations

8.4.3.1 For donors donating multiple times over > 1 week, additional parameters should be considered. These donors are more likely to become iron deficient, hypokalemic, or hypoproteinemic over longer donation times. As such, these donors require more careful monitoring and follow-up.

8.4.3.2 Donors must demonstrate, as applicable, that they can:
8.4.3.2.1 Be compliant with medications prescribed by their physician.
8.4.3.2.2 Take care of their CVC, or report to care sites within Duke University Health Systems for this care.
8.4.3.2.3 Be compliant with appointments, generally twice per week.
8.4.3.2.4 Be able to avoid contact sports or contact activities during work or other daily responsibilities.

8.4.3.3 Adult allogenic donors must have an adequate hemoglobin ($\geq 9$ g/dL) and platelet count ($\geq 50,000/\mu$L) before each collection.
8.4.3.4 Granulocyte donors must have a hemoglobin ($\geq 10$ g/dL) before each collection.

8.4.3.4.1 If the donor's hemoglobin is $< 10.5$ g/dL, check the hemoglobin the day before the next planned collection. If the hemoglobin is $\geq 10$ g/dL, proceed with the procedure the next day without waiting for labs that are drawn at the time of the procedure.

8.4.3.4.2 If the hemoglobin is less than $< 10$ g/dL, skip procedure and recheck the day before the next planned procedure.

8.4.3.5 Adult autologous donors must have a hemoglobin ($\geq 8$ g/dL) and platelet count ($\geq 15,000/\mu$L) before each collection.

NOTE: The autologous donor may donate with hemoglobin between 7 and 7.9 g/dL if the autologous donor is receiving a blood transfusion at the end of the collection procedure.

8.4.3.6 Pediatric donors must have an adequate hemoglobin and platelet count prior to each collection. Pediatric donors weighing less than 50 kg, for which the cell separator is primed with packed red cells, the prepheresis parameters are a hemoglobin $> 9$ g/dL and platelet count $\geq 75,000/\mu$L. Pediatric patients weighing more than 50 kg, for which the cell separator is NOT primed with packed red cells, the prepheresis parameters are a hemoglobin $> 10$ g/dL and a platelet count $> 75,000/\mu$L.

8.4.3.7 Adult allogenic donors returning for PBSC or Bone Marrow Harvest (BMH) donation within 6 months of original donation must have their previous medical records, test and labs reviewed by primary clinical team or designee to be cleared for repeat donation. A progress note must be documented to support approved clearance.

8.4.3.8 Adult allogenic donors returning for PBSC or BMH donation greater than 6 months of original donation must have a full repeat donor selection evaluation.

8.4.3.9 Any original adult allogenic PBSC donor returning for DLI donation must have their previous medical records, test and labs reviewed by primary clinical team or designee to be cleared for repeat donation. A progress note must be documented to support approved clearance.

8.4.4 Summary of Donor Eligibility

8.4.4.1 Prior to the first day of collection, the program-specific form, either APBMT-COMM-001 FRM2 Summary of Donor Eligibility and Infectious Disease Testing (PBMT) or APBMT-COMM-001 FRM3 Summary of Donor Eligibility
and Infectious Disease Testing (ABMT), must be completed on all allogenic donors.

8.4.4.2 If donor does not meet the criteria for donation and the donor is classified as an "URGENT MEDICAL NEED", the physician will advise the recipient of these findings.

8.4.4.3 For APBMT-COMM-001 FRM2 Summary of Donor Eligibility and Infectious Disease Testing (PBMT) or APBMT-COMM-001 FRM3 Summary of Donor Eligibility and Infectious Disease Testing (ABMT), Section C: Emergency/Exceptional Release must be completed and signed by the physician. A signature from the Quality Manager/designee is also required for emergency/exception release of collected product.

8.4.4.3.1 This form will be effective for 30 days (for PBSC, BM, and Granulocytes) or 7 days (for DLI, NK Cells) if there are no new exceptions.

8.4.4.4 The original completed form must accompany the product to the SCTL.

8.4.4.5 In the event cellular therapy products needs to be distributed prior to the completion of donor eligibility determination, there will be documentation that donor eligibility determination was completed during or after the use of the product.

8.5 Donor Collection

8.5.1 Collection from a donor who does not meet collection safety criteria will require documentation of rationale of his/her selection by the attending physician. Collection staff shall document the review of any donor health or safety issues pertaining to the collection procedure in writing to the Marrow Collection Facility staff prior to the collection.

8.5.2 Bone Marrow Donors:

8.5.2.1 BM is collected by a Physician and Physician Assistant or Nurse Practitioner trained in marrow collection in a Duke Hospital Operating Room under sterile conditions.

8.5.2.2 BM donors undergo a pre-operative assessment by the anesthesiologist to determine their candidacy for anesthesia per the Duke Hospital Clinical Practice Guidelines.

8.5.2.3 BM donors will be screened the same as PBSC donors.

8.5.3 Central Venous Catheter (CVC) Placement:

8.5.3.1 Adult autologous donors may have a CVC or PIV placed prior to collection. Adult allogeneic donors will have a vein assessment by an apheresis nurse in consultation with the BMT physician and a plan for CVC placement or stand-by appointment will be made if needed on donation day.
NMDP donors who have a CVC placed that must be retained overnight, will be hospitalized until the CVC is removed. They will be transported by ambulance or accompanied by a member of the ABMT medical or nursing team.

8.5.3.2 CVC are placed by a licensed physician qualified to perform the procedure, including pediatric surgeons, general surgeons, or a vascular radiologists.

8.5.3.3 Correct placement of the CVC placed in Interventional Radiology (IR) is performed using ultrasound guidance and confirmed by radiograph. If CVC was placed in general surgery, placement is confirmed by chest x-ray. The confirmatory reports are located in the Duke EMR and a copy may be placed in the patient/donor’s medical record and shadow chart. If catheter is placed at a referring hospital, a copy of the CVC confirmatory report is obtained and placed in the donor chart.

8.5.3.4 Anesthesia is administered by a board certified adult or pediatric Anesthesiologist per Duke Hospital Guidelines. Conscious sedation may be used for donors whose catheters are placed in Vascular Radiology. In that case, the physicians administering the conscious sedation are approved by the Duke Hospital Certification Program for Administration of Conscious Sedation.

8.5.4 Growth Factor Administration:

8.5.4.1 Hematopoietic Growth Factors (cytokines) are administered under the supervision of a licensed physician experienced in the management of persons receiving these agents. Pregnancy testing will be done prior to administration of cytokines for all women of childbearing age. Hemoglobin electrophoresis, if indicated, will be drawn to screen for hemoglobinopathy prior to the administration of cytokines.

8.5.4.2 Specific orders for each patient/donor are generated by the physician/PA/NP and filled by the Duke Inpatient/Outpatient Pharmacy, licensed pharmacy or Home Health Pharmacy depending on the patient’s arrangement with their third party payer.

8.5.4.3 Growth factors are generally administered by the subcutaneous route a minimum of one hour to a maximum 12-16 hours before the next planned procedure.

8.5.5 Assessment of the Patient/Donor before each apheresis procedure:

8.5.5.1 Pediatric BMT: The patient/donor will have a CBC, manual differential, CMP, coagulation tests and ABO/Rh or Type and Screen prior to each procedure (bone marrow harvest or apheresis).
8.5.5.2 Adult BMT: The patient/donor will have a CBC/diff, CMP, Mg, and ABO/Rh or Type and Screen prior to each apheresis procedure.

8.5.6 Apheresis procedure:

8.5.6.1 Cellular therapy products from all donors are collected on an automated cell separator.

8.5.6.2 If a pediatrics patient’s weight is < 50 kg, the cell separator is primed with a unit of irradiated, leukodepleted, ABO/Rh compatible PRBCs prior to initiation of the apheresis procedure.

8.5.6.3 After clearance and informed consent and the CVC is placed (if indicated), the donor will be given an appointment for the apheresis procedure. Pediatric autologous collection may have CVC placed same day as apheresis procedure. After the patient arrives for their appointment and checks into the clinic, the nurse will take vital signs. The apheresis nurse will administer the PBMT-COLL-007 Interim Pediatric Donor History Questionnaire or the APBMT-COMM-003 Interim Donor History Questionnaire. The nurse will administer growth factor, if indicated. If the donor is healthy and well, with no new issues, the apheresis nurse will proceed with the apheresis procedure. If the donor has any medical issues, the apheresis nurse will notify the physician for evaluation.

8.6 Donor Management

8.6.1 Management of Blood Loss

8.6.1.1 If for any reason the blood contained in the extracorporeal circuit cannot be returned to the patient, the volume of blood lost will be recorded on the RUN sheet. The PBMT/ABMT physician or designee will be notified. A hematocrit may be drawn and transfusion arranged if necessary. Extracorporeal volumes can be recalculated based on the new hematocrit. A donor who has lost the equivalent volume of a whole blood donation will be advised that he/she is deferred from donation for 8 weeks. The donor may donate in less than eight weeks as long as the donor meets the criterion for hemoglobin naturally or via transfusion and is approved for donation by the medical director.

8.6.2 Management of Thrombocytopenia:

8.6.2.1 Apheresis donors may develop thrombocytopenia, especially after repeated, frequent donations.

8.6.2.2 For autologous donors in the Adult program, the apheresis procedure generally cuts the original platelet count in half. Platelets infusion may be required if suspected platelet count
at the completion of 6 hours of collection is < 25,000/μL. Patient may be discharged after apheresis procedure if platelet count is ≥ 25,000/μL.

8.6.2.3 For allogeneic donors in the adult program, the apheresis procedure is discontinued if the donor’s platelet count is less than 50,000/μL. A prescription will be given to the donor for a CBC to be drawn at home, with results faxed to the transplant coordinator.

8.6.2.4 For NMDP donors, the apheresis procedure is discontinued if the donor’s platelet count is < 80,000/μL.

8.6.2.5 For allogeneic donors in the pediatric program, the apheresis procedure is discontinued if the donor’s platelet count is < 50,000/μL.

8.6.3 Management of Hypocalcemia:
8.6.3.1 Many patient/donors develop hypocalcemia during the apheresis procedure. In anticipation of this potential complication:

8.6.3.1.1 All pediatric patients are placed on a calcium infusion during the apheresis procedure.

8.6.3.1.2 Adult patients/donors are placed on a calcium infusion during apheresis preemptively. If they experience citrate toxicity related to apheresis, the APBMT-COLL-014 Heparin Protocol can also be instituted.

8.6.4 Management of Anemia:
8.6.4.1 Allogeneic donors undergoing multiple apheresis procedures may develop iron deficiency anemia. These donors may be treated with therapeutic iron replacement as per their physician. Specific parameters for the lower limit of hemoglobin values prior to apheresis will be specified in the donor’s orders. In general, healthy donors will be required to maintain a hemoglobin > 9 g/dL to continue donations.

8.7 Post Apheresis/Marrow Procedure Donor Management:
8.7.1 ABMT and PBMT autologous and allogeneic donors are given printed educational information describing the apheresis or marrow donation process. The contact phone numbers are listed for the ABMT and PBMT clinic and for after care for either the inpatient unit for the adult program or the 24/7 on-call physician for the pediatric program.

8.7.2 For apheresis or marrow related events that require follow-up, the donor will be managed by the ABMT or the PBMT transplant physician/designee. Follow-up care will be coordinated with the donor’s home physician for donors who live out of the Duke Hospital vicinity.
8.7.3 Staff from the Stem Cell Laboratory will report positive cultures for any cellular product to the patient’s Attending Physician. (See related STCL procedures: STCL-QA-007 Non-Conforming Products- Receipt, Processing, Distribution, and Disposition; STCL-EQUIP-011 Sterility Culture Using BacT-Alert Microbiology System.) Confirmed positive sterility results will be assessed for medical significance by the physician and a determination will be made regarding whether the donor and/or recipient should be notified and/or treated. If warranted, a treatment plan will be initiated. If indicated, the treatment plan will be based on the organism detected and may include blood cultures, antibiotic therapy, possible central line removal, and re-collection of cells if the product must be discarded.

8.7.4 All apheresis adverse events must be documented on APBMT-COMM-030 FRM1 Adverse Event Form per procedure APBMT-COMM-030 Recording and Reporting of Adverse Events. All serious or high grade adverse events will be documented in the physician’s note and reported to the Duke Hospital Safety Reporting System (SRS).

8.7.5 Adverse events that occur due to a failure or malfunction of equipment or tubing set will be reported to the Duke Hospital Safety Reporting System (SRS).

8.7.6 All allogenic donors will be called or seen in clinic within 24 to 72 hours post collection. Even if there are no issues reported, the donor coordinator/nurse coordinator or designee will call within four to six weeks post collection to inquire on donor condition. If there are issues or concerns, the donor coordinator/nurse coordinator will call weekly until all issues have been resolved. All documentation will be recorded in the electronic medical record.

8.7.7 In the event there is a collection-related complication, the collection facility will notify the clinical program for the ongoing management of the specific complication(s).

8.7.8 If the collection-related event occurs with a donor from a registry, the clinical program will notify that registry of the complication and management.

8.8 Confirmation of Cellular Therapy Products

8.8.1 The attending physician will confirm the availability and suitability of a donor or cellular therapy product prior to initiating the recipient’s preparative regimen.

8.8.2 The clinical program will notify the processing facility (STCL) prior to requesting a cellular therapy product from a cord blood bank, registry, or other facility.

9 RELATED DOCUMENTS/FORMS

9.1 ABMT-COLL-014 Heparin Protocol

9.2 APBMT-COMM-001 FRM1 Emergency Release of Cellular Product
9.3 APBMT-COMM-001 FRM2 Summary of Donor Eligibility and Infectious Disease Testing (PBMT)
9.4 APBMT-COMM-001 FRM3 Summary of Donor Eligibility and Infectious Disease Testing (ABMT)
9.5 APBMT-COMM-002 Adult Donor Health History Questionnaire
9.6 APBMT-COMM-003 Interim Donor History Questionnaire
9.7 APBMT-COMM-030 Recording and Reporting of Adverse Events
9.8 APBMT-COMM-030 FRM1 Adverse Event Form
9.9 PBMT-COLL-001 Pediatric Donor Health History Questionnaire
9.10 PBMT-COLL-007 Interim Pediatric Donor History Questionnaire

10 REFERENCES
10.3 Food and Drug Administration. 21 CFR 1271, Human Cellular and Tissue-Based Products.
10.4 Public Health Service Act section 361

11 REVISION HISTORY

<table>
<thead>
<tr>
<th>Revision No.</th>
<th>Author</th>
<th>Description of Change(s)</th>
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<tr>
<td>21</td>
<td>Sally McCollum</td>
<td>- Section 2.1.1: updated to include Peripheral Blood Mononuclear Cells.</td>
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<tr>
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<td>- “Peripheral Blood Mononuclear Cells” and “Family Nurse Practitioner” added to list of definitions.</td>
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<td>- Section 8.1.1.1: updated to further detail care around minor donors and adult donors.</td>
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<td></td>
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<td>- Section 8.2.3.1: the following sentence was removed as it is not applicable in all situations- If this is not possible, a directed donor unit of RBCs is procured from an ABO/Rh compatible family member in advance of the procedure.</td>
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<td>- Section 8.2.5: updated with minor wording updates.</td>
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<td>- Section 8.5.3: “Central Venous Line” changed to “Central Venous Catheter” for consistency with the hospital’s access team standard terminology.</td>
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# Signature Manifest

**Document Number:** APBMT-COMM-001  
**Revision:** 21  
**Title:** Donor Selection, Evaluation and Management  

*All dates and times are in Eastern Time.*

## APBMT-COMM-001 Donor Selection, Evaluation and Management

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