AGENDA
CIBMTR WORKING COMMITTEE FOR DONOR HEALTH AND SAFETY
Grapevine, TX
Friday, February 28, 2014, 2:45 - 4:45 pm

Co-Chair: Steven Goldstein, MD, University of Michigan, Ann Arbor, MI; Telephone: 734-764-8824; Fax: 734-615-2719; E-mail: stevengo@med.umich.edu
Co-Chair: Paul O’Donnell, MD, Fred Hutchinson Cancer Research Center, Seattle, WA; Telephone: 206-667-5191; Fax: 206-667-1034; E-mail: podonnel@fhcrc.org
Co-Chair: Bronwen Shaw, MBChB, MRCP, PhD, Anthony Nolan Research Institute, London, UK; Telephone: +44-2072848339; Fax: +44-2072848331; E-mail: bshaw@doctors.org.uk
Statisticians: Brent Logan, PhD, CIBMTR Statistical Center; Telephone: 414-955-8849; Fax: 414-955-6513; E-mail: blogan@mcw.edu
Deidre Kiefer, MPH, CIBMTR Minneapolis; Telephone: 612-884-8649; Fax: 612-627-5899; E-mail: dkiefer@nmdp.org
Pintip Chitphakdithai, PhD, CIBMTR Minneapolis; Telephone: 612-617-8309; Fax: 612-627-5899; E-mail: pchitpha@nmdp.org
Scientific Director: Dennis Confer, MD, National Marrow Donor Program, Minneapolis, MN; Telephone: 612-362-3425; Fax: 612-627-8125; E-mail: dconfer@ndmp.org

1. Introduction (D Confer)
   a. Minutes and Overview Plan from February 2013 meeting (Attachment 1)
   b. Newly appointed Co-Chair: Michael Pulsipher, MD, University of Utah School of Medicine, Salt Lake City, UT; Telephone: 801-662-4830; Fax: 801-662-4707; E-mail: michael.pulsipher@hsc.utah.edu

2. Accrual summary (Attachment 2) (D Confer)

3. Presentations, published or submitted papers (D Confer)


1
4. **Studies in progress** (Attachment 3)
   
a. **DS05-02** RDSafe (Attachment 4) (M Pulsipher) *Supplemental form/Data Collection*

   b. **DS08-01** Abnormal cytos in donor derived stem cells after allo HCT (N Frey/D Porter/R Maziarz) *Supplemental form/Data Collection*

   c. **DS09-03** Effects of multiple donations on marrow/PBSC donors (D Stroncek/M Pulsipher) *no update*

   d. **DS09-04** Race/Socioeconomic status/donor center size on BM/PBSC donor experience (Attachment 5) (M Pulsipher) *Analysis*

   e. **DS09-05b** PB vs BM donor SAEs (M Pulsipher/D Confer) *Submitted*

   f. **DS10-01** Effect of race/ethnicity on yields in donors undergoing large volume apheresis (Attachment 6) (J Hsu/J Wingard) *Manuscript Preparation*

   g. **DS13-01** Assessment of the potential impacts BM product quality on HCT (N Prokopishyn) *Draft Protocol*

   h. **DS13-02** Clinical impact of ABO incompatibility on alloHCT (B Shaw) *Protocol development*

5. **New study proposals** (Attachment 7)
   
a. **PROP 1311-30** Survey of the care and management of adult related allogeneic SC donors in the US (C Anthias/B Shaw/P O’Donnell) *Protocol development*

6. **Other business** (D Confer)
   
a. Defining efficiency for bone marrow harvests and PBSC collections.

7. **Closing remarks** (D Confer)
MINUTES AND OVERVIEW PLAN
CIBMTR WORKING COMMITTEE FOR DONOR HEALTH AND SAFETY
Salt Lake City, Utah
Thursday, February 14, 2013, 2:45 pm – 4:45 pm

Co-chair: David Stroncek, MD; National Institutes of Health, Bethesda, MD
Telephone: 301-402-3314; Fax: 301-402-1360; E-mail: dstroncek@dtm.cc.nih.gov

Co-chair: Steven Goldstein, MD; University of Michigan Cancer Center, Philadelphia, PA
Telephone: 734-764-8824; Fax: 734-615-2719; E-mail: stevengo@med.umich.edu

Co-chair: Paul O’Donnell, MD; Fred Hutchinson Cancer Research Center, Seattle, WA
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Telephone: 414-456-8849; Fax: 414-456-8313; E-mail: blogan@mcw.edu

Scientific Director: Dennis Confer, MD; National Marrow Donor Program, Minneapolis, MN
Telephone: 612-362-3425; Fax: 612-627-8125; E-mail: dconfer@nmdp.org

1. Introduction
Dr. Stroncek called the meeting to order at 2:46 pm. Drs. Stroncek, Goldstein, and O’Donnell chaired the meeting. Attendees were welcomed and introductions of the Working Committee staff were made. Minutes from the February, 2012 meeting was approved.

Dr. Stroncek welcomed new Co-Chair Bronwen Shaw, MD, PhD.

2. Accrual summary
Dr. Confer briefly reviewed the accrual summary for the committee.

3. Published/submitted papers and presentations

4. Studies in progress

a. **DS05-02** RDSafe: A multi-institutional study of HSC donor safety and quality of life (M Pulsipher)
   Dr. Pulsipher updated the committee on this study. This study has enrolled 1700 donors and about 50-60 donors per months. Enrollment is complete for older cohort (N>250) but younger cohort hasn’t met the accrual yet. It is going to continue to accrue and funding ends June 2014. Next steps will be informed by study results.

b. **DS08-01** The identification of cytogenetic abnormalities in donor derived hematopoietic cells after unrelated donor stem cell transplantation (N Frey)
   Dr. Goldstein updated the status of the study. There are 6 cases indentified from 1998 – 2007. Willis Navarro will look up to 2012 data to indentify more cases.

c. **DS09-03** Effects of second donations on marrow and PBSC donors (D Stroncek)
   Dr. Stroncek overviewed the study. The study aims to 1) compare the second donation experience in terms of baseline counts, hematologic recovery, collection yield and serious, life-threatening or adverse events and long-term pain or disability, 2) determine first donation results or characteristics which impact the risk of a poor outcome during a second donation, 3) determine donor characteristics which are predictive of a second donation. Suggestions from the committee are including marrow-marrow donation and expanding the data set up to the end of 2012. The protocol will be finalized and routed to the committee for review and comment.

d. **DS09-04** The effect of race, socioeconomic status, and donor center size on bone marrow and PBSC donor experiences (M Pulsipher)
   Dr. Pulsipher presented the study. The same data set for the bone marrow versus peripheral blood stem cell donation Blood paper is used for this study. It includes over 10000 donors from 2005 to 2009. Challenges include determination of center effect based on donor center size and methodology of assessing social economic status. Zip codes are used to compute median household income but there are 19% missing in the data set. The preliminary analysis will be circulated soon.

e. **DS09-05b** PBSC versus bone marrow donor severe adverse events (M Pulsipher)
   Dr. Pulsipher presented the preliminary results of this study. Previous studies by this committee reported a detailed comparison of the acute toxicities experienced by bone marrow (BM, n=2726) and peripheral blood stem cell (PBSC, n=6768) donors collected at National Marrow Donor Program (NMDP) centers between 2004 and 2009, concluding that although the donation experiences are similar, specific groups of donors (female, obese) were more likely to experience toxicities. Over 1,600 reported events to the NMDP were reviewed by a five physician panel. Serious adverse events fell into the following categories: 1) death, 2) life threatening events, 3) unplanned overnight hospitalization for expected (nausea, fainting, etc.) or unexpected events, 4) persistent or significant disability, 5) congenital anomaly, or 6) other. Overall rates of SAEs were significantly higher after BM donation (n=65, 2.38%) compared to PBSC donation (n=38, 0.56%; p<0.001). There were more life threatening events, unplanned overnight hospitalizations, and persistent or significant disabilities after BM donation compared to PBSC donation. Logistic regression models were built for SAE with or without expected hospitalizations. Multivariate analysis showed that although SAEs are uncommon, they are higher after BM compared with PBSC donation with or without expected hospitalization. In addition, women are at higher risk of SAEs with BM donation with expected hospitalization. Other SAEs of concern includes cancer and autoimmune diseases. Rates of cancer and autoimmune illness after BM vs. PBSC donation in this cohort were analyzed. There are no significant difference for incidence of cancer, autoimmune
disease, and non-melanoma skin cancer after BM and PBSC donations. The study is currently in manuscript preparation.

f. **DS10-01** Effect of demographics on peripheral blood CD34+ counts and CD34+ yields in donors undergoing large volume leukapheresis (J Hsu / J Wingard)

Dr. Hsu updated the study. The study aims to determine the influence of race/ethnicity on the number of CD34+ cells collected. Suggestions from the committee include 1) adding recipient weight, apheresis volume and CVC insertion, 2) having primary endpoint just for collections on the 1st day, 3) removing the effect of race and ethnicity on graft composition since it is not collected, and 4) excluding dose of GCSF. The study protocol is currently in development.

5. **Future / proposed studies**

a. **PROP 1112-48** Retrospective examination of the role quantity of bone marrow harvests performed by a harvest center has on the overall quality of the harvested product. Assessment of the Potential impacts bone marrow product quality has on utilization of bone marrow as a cell source for transplant (N Prokopishyn)

Dr. Confer presented the proposal. The study aims to 1) examine the quantity (i.e. number) and relative quality (i.e. volume and total nucleated cell count of product harvested as compared to standard and minimal acceptable amounts) of bone marrow harvests performed by harvest centers from 1990 – 2012, 2) examine impact of number of harvests performed on achievement of harvest goals, 3) investigate the impact of harvest success on the utilization of bone marrow products by transplant centers to determine if there is a correlation between use of bone marrow as a cell source, overall quality of product received, number of harvests performed per year, and number of harvests performed by the harvesting centers. Comments from the committee include 1) using total nucleated cells per ml, 2) changing of bone marrow harvest process from 1990 - 2012 will make a difference, and 3) The fact that requests from transplant are not reported makes it difficult to compare requested versus received cell dose. In voting, the committee gave this proposal a rating of 2 on a scale of 1 (high scientific impact) to 9 (low scientific impact). The proposal was approved.

6. **Discuss development of new projects/studies**

a. NMDP has observed a trend towards increased utilization of bone marrow for unrelated donor HCT. Bone marrow collections were up 30% in October-December 2012 versus October-December 2011. Should the committee consider development of projects/studies to improve marrow harvest safety and efficiency?

Dr. Shaw led a discussion about improving bone marrow harvest safety and efficiency. Bone marrow collections are growing twice of the rate of PBSC collections in October-December 2012 versus October-December 2011. It is a concern for many centers that the quality of marrow product and safety of marrow donors. One suggestion included trying to have some training program at next year council meeting.

7. **Other business**

a. Dr. Confer provided an update on form revisions. Comments from last year meeting are: adding donor height and weight, pre-donation hematocrit and WBC especially for pediatric donors, anesthesia times and to make sure that graft/product data were collected at time of infusion to Form 2006. From 2006 hasn’t been revised by now. Suggestions from the committee include using the forms used in the RDSafe study as a guide for revising the From 2006 and looking at Tanya Pedersen’s file about gathering the minimum data set recommendation put forth by the
Donor Outcome Workshops held in Berne and Leiden.

b. Dr. Stroncek raised the issue of serious adverse events (SAE) reporting. Forms that standardize the way measuring SAES would be helpful. In anticipation of Cord Blood licensure in Oct 2011 a module was placed in FN2 for SAE collection. Transplant centers have been educated to use them. SAE forms have been released for cord blood, bone marrow and PBSC for recipient SAES. Donor SAES are continuing to be reported on Form 701. There is a plan to migrate the donor SAES to a more comprehensive system as the recipient SAES.

The meeting was adjourned at 4:29 pm.

### Working Committee Overview Plan for 2013-2014

a. **DS05-02 RDSafe**: A multi-institutional study of HSC donor safety and quality of life. We are continuing to accrue until July 2014.

b. **DS08-01** The identification of cytogenetic abnormalities in donor derived hematopoietic cells after unrelated donor stem cell transplantation. We anticipate submitting the manuscript for peer-review by July 2013.

c. **DS09-03** Effects of second donations on marrow and PBSC donor. We anticipate developing the study protocol by July 2013. We anticipate submitting the manuscript for peer-review by December 2013.

d. **DS09-04** The effect of race, socioeconomic status, and donor center size on bone marrow and PBSC donor experiences. We anticipate developing the study protocol by March 2013. The analysis for this study will be completed by August 2013 and an abstract submitted for the 2013 meeting of the American Society of Hematology. We anticipate submitting the manuscript for peer-review by December 2013.

e. **DS09-05b** PBSC versus bone marrow donor severe adverse events. We anticipate submitting the manuscript for peer-review July 2013.

f. **DS10-01** Effect of demographics on peripheral blood CD34+ counts and CD34+ yields in donors undergoing large volume leukapheresis. We anticipate developing the study protocol by March 2013. The analysis for this study will be completed by August 2013 and an abstract submitted for the 2013 meeting of the American Society of Hematology. We anticipate submitting the manuscript for peer-review by December 2013.

g. **DS 13-01** Retrospective examination of the role quantity of bone marrow harvests performed by a harvest center has on the overall quality of the harvested product. We anticipate sending feedback to PI and requesting draft proposal by July 1, 2013. We anticipate developing the study protocol by December, 2014.

h. **DS 13-02** Retrospective analysis to understand the potential mechanisms underlying the clinical impact of ABO incompatibility. We anticipate finishing data file preparation by June 2013 and an
abstract submitted for the 2013 meeting of the American Society of Hematology. We anticipate submitting the manuscript for peer-review by June 2014.

**Work Assignments for Working Committee Leadership (February 2013)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Assignment Details</th>
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| Dennis Confer      | **DS05-02 RDSafe:** A multi-institutional study of HSC donor safety and quality of life  
 |                     | **DS08-01:** The identification of cytogenetic abnormalities in donor derived hematopoietic cells after unrelated donor stem cell transplantation  
 |                     | **DS09-05b:** PBSC versus bone marrow donor severe adverse events |
| Paul O’Donnell     | **DS09-03:** Effects of second donations on marrow and PBSC donor |
| Bronwen Shaw       | **DS09-04:** The effect of race, socioeconomic status, and donor center size on bone marrow and PBSC donor experiences  
 |                     | **DS13-01:** Retrospective examination of the role quantity of bone marrow harvests performed by a harvest center has on the overall quality of the harvested product |
| Steven Goldstein   | **DS10-01:** Effect of demographics on peripheral blood CD34+ counts and CD34+ yields in donors undergoing large volume leukapheresis |
## Accrual Summary for Donor Health and Safety Working Committee

Characteristics of NMDP donors donating between 1987 and December 2012

<table>
<thead>
<tr>
<th>Variable</th>
<th>MARROW N (%)</th>
<th>PBSC N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of donors</td>
<td>21904</td>
<td>24652</td>
<td>46556</td>
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<tr>
<td>Donor age at time of donation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>18 to 29</td>
<td>6827 (31)</td>
<td>9786 (40)</td>
<td>16613 (36)</td>
</tr>
<tr>
<td>30 to 39</td>
<td>7825 (36)</td>
<td>7361 (30)</td>
<td>15186 (33)</td>
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<tr>
<td>40 to 49</td>
<td>5697 (26)</td>
<td>5454 (22)</td>
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<td>50+</td>
<td>1555 (7)</td>
<td>1989 (8)</td>
<td>3544 (8)</td>
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<td>62 (N/A)</td>
<td>62 (N/A)</td>
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<td>Median (Range)</td>
<td>35 (18-61)</td>
<td>33 (18-62)</td>
<td>34 (18-62)</td>
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<td>Donor race/ethnicity</td>
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<td>Caucasian</td>
<td>16772 (77)</td>
<td>19548 (79)</td>
<td>36320 (78)</td>
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<td>Hispanic</td>
<td>1631 (7)</td>
<td>1532 (6)</td>
<td>3163 (7)</td>
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<td>Black/African American</td>
<td>1012 (5)</td>
<td>744 (3)</td>
<td>1756 (4)</td>
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<tr>
<td>Asian/Pacific Islander</td>
<td>833 (4)</td>
<td>848 (3)</td>
<td>1681 (4)</td>
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<tr>
<td>American Indian/Alaska Native</td>
<td>248 (1)</td>
<td>181 (1)</td>
<td>429 (1)</td>
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<tr>
<td>Other/Multiple Race</td>
<td>632 (3)</td>
<td>1015 (4)</td>
<td>1647 (4)</td>
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<tr>
<td>Decline/Unknown</td>
<td>776 (4)</td>
<td>784 (3)</td>
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<tr>
<td>Donor sex</td>
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<tr>
<td>Female</td>
<td>8665 (40)</td>
<td>8582 (35)</td>
<td>17247 (37)</td>
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<td>13239 (60)</td>
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<td>60 (N/A)</td>
<td>60 (N/A)</td>
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<td>22248 (90)</td>
<td>41868 (90)</td>
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<td>2136 (10)</td>
<td>2309 (9)</td>
<td>4445 (10)</td>
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<td>3</td>
<td>148 (1)</td>
<td>95 (&lt;1)</td>
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<td>13222 (60)</td>
<td>15496 (63)</td>
<td>28718 (62)</td>
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<td>--------------</td>
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<td>N (%)</td>
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<td>860 (4)</td>
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<td>2009</td>
<td>875 (4)</td>
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<td>2010</td>
<td>950 (4)</td>
<td>2915 (12)</td>
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<td>2011</td>
<td>996 (5)</td>
<td>3200 (13)</td>
<td>4196 (9)</td>
</tr>
<tr>
<td>2012</td>
<td>1166 (5)</td>
<td>3382 (14)</td>
<td>4548 (10)</td>
</tr>
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Determination of Stem Cell Donor Suitability $^a,b$

Donor Assessment on Day of Marrow Collection Procedure $^a,c$

Filgrastim Mobilized PBSC Day Five and Day Six Donor Assessment/Apheresis Procedure $^a,d$

Marrow Product Analysis $^a,e$

PBSC Product Analysis $^a,f$
a Completed with FormsNet1 or FormsNet2 (approximately 2004 and forward).
b Form 700 collects information related to vital signs, hematology, MTC, infection, pain, and venous access.
c Form 732 collects information related to MTC, infection, pain, vital signs, pre-collection hematology, and post-collection hematology, ABO typing.
d Form 730 collects information related to MTC, infection, pain, vital signs, pre-apheresis hematology, post-apheresis hematology, ABO typing.
e Form 772 collects information related to marrow product.
f Form 700 collects information related to PBSC product analysis.

Abbreviations: NMDP – National Marrow Donor Program; PBSC – Peripheral blood stem cell; CMV – Cytomegalovirus; MTC – Modified toxicity criteria.
TO:     Donor Health and Safety Working Committee Members

FROM:   Dennis Confer, MD
         Scientific Director for the Donor Health and Safety Working Committee

RE:     Studies in Progress Summary

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**DS05-02: RDSafe: A multi-institutional study of HCT donor safety and quality of life (M Pulsipher):**
The goals of this study include: comparing the incidence of adverse events, and the quality of life of related donors to unrelated donors. Pediatric, adult, and older adult (60+ year olds) related donors will be enrolled. Enrollment ended for adult donors on May 31, 2013 and enrollment for pediatric donors will continue until July 2014. As of January 30, 2014, 261 pediatric donors had been enrolled. A first report of baseline and donation-related pain, and recovery time of older donors will be presented on Sunday, March 2, 2014 at 10:30 am, in Room Texas B (Gaylord Texan). Update (M Pulsipher).

**DS08-01: Abnormal cytogenetics in donor derived stem cells after allogeneic HCT (N Frey):** Goals of the study include: describing the presentation and natural history of cytogenetic abnormalities and hematopoietic malignancies arising in unrelated donor derived hematopoietic cells after unrelated donor hematopoietic stem cell transplantation (HSCT). The study will also describe the current practice of donor evaluation and management in the event of a donor derived abnormality in the recipient. Update (N Frey).

**DS09-04: Race/socioeconomic status and donor center size on bone marrow and PBSC donor experience (M Pulsipher):** The primary goal of this study is to determine whether the donation experience varies by race and ethnicity, SES, and donor center size. The study protocol has been approved and analysis has started. Update (M Pulsipher).

**DS09-05b: PBSC versus bone marrow donor severe adverse events (M Pulsipher):** The primary aim of this study is to compare serious unexpected or life threatening adverse events for PBSC and bone marrow donors. The manuscript for this study has been submitted. Update (M Pulsipher).

**DS10-01: Effect of demographics on peripheral blood CD34+ counts and CD34+ cell yields in donors undergoing large volume leukapheresis (J Hsu/J Wingard):** The goal of this study is to determine the influence of race and ethnicity on CD34+ cell yields in allogeneic peripheral blood donors after G-CSF administration. The study protocol was approved and analysis completed. This study was presented at the ASH Meetings in New Orleans, LA, December 2013, and is now in manuscript preparation. Update (J Hsu/J Wingard).
Studies previously accepted, but not initiated

**DS09-03:** Effects of multiple donations on marrow/PBSC donors (D Stroncek): This study aims to: 1) Compare the second donation experience in terms of baseline counts, hematologic recovery, collection yield and serious, life-threatening or adverse events and long-term pain or disability of NMDP unrelated donors making two PBSC donations or making a BM then PBSC donation with the first donation experience of NMDP unrelated donors making one PBSC donation, 2) Determine first donation results or characteristics which impact the risk of a poor outcome during a second donation, and 3) Determine first donation donor characteristics which are predictive of a second donation. The study is currently in protocol development. No update.

**DS13-01:** Retrospective examination of the role quantity of bone marrow harvests performed by a harvest center has on the overall quality of the harvested product: Assessment of the potential impacts bone marrow product quality has on utilization of bone marrow as a cell source for transplant (N Prokopishyn): This study aims to: 1) Examine the quantity (i.e. number) and relative quality (i.e. volume and total nucleated cell count of product harvested as compared to standard and minimal acceptable amounts) of bone marrow harvests performed by harvest centers from 1990 – 2012, 2) Examine impact of number of harvests performed on achievement of harvest goals, and 3) Investigate the impact of harvest success on the utilization of bone marrow products by transplant centers to determine if there is a correlation between use of bone marrow as a cell source, overall quality of product received, number of harvests performed per year, and number of harvests performed by the harvesting centers. This study currently has a draft protocol. Update (B Shaw for N Prokopishyn).

**DS13-02:** A retrospective analysis to understand the potential mechanisms underlying the clinical impact of ABO incompatibility on allogeneic transplant outcomes (B Shaw): The primary aim of this this study is to examine the impact of ABO mismatching (match, major mismatch, minor mismatch, bidirectional mismatch) on overall survival; secondary effects to examine are the association of ABO matching on graft manipulation method (none vs plasma removal/depletion vs red cell depletion method vs other) and the impact of graft manipulation on infused cell count (CD34/TNC) and transplant outcome. This study is in protocol development. Update (B Shaw).
2014 BMT TANDEM MEETINGS ABSTRACT

Related PBSC donors age >60 have high rates of baseline and donation-related pain and slow recovery: First report from the Related Donor Safety study (RDSafe)

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As the use of hematopoietic cell transplantation (HCT) in older patients has increased over the past decade, so too have donations from their older siblings. Prospective data addressing the experiences of older donors are limited, though such donors are more likely than younger donors to have comorbidities, and are often motivated to give in spite of potential risks. To address this lack of data, the NHLBI-funded Related Donor Safety Study (RDSafe) prospectively enrolled related donors of all ages between 2010-2013 at 54 transplant centers in the United States, assessed their pre-donation comorbidities and health status, and followed them for 1 year after donation, collecting detailed information on pain levels and 12 additional frequently noted symptoms, e.g., nausea, vomiting, insomnia. This report describes early experiences of 256 donors age >60.

Results: At baseline there were high rates of pre-G-CSF pain and symptoms in older donors, with 28% experiencing grades 1-3 pain and 17% grades 1-3 symptoms (baseline rates from earlier NMDP data for 41-60 year olds were 9% and 5%, respectively, with no grade 3 or greater). Peak rates of all grades of pain and symptoms at day 5 of G-CSF (day 1 of collection) were 69% and 49%, respectively (see figure). Of note, 11% experienced grades 3-4 pain; in contrast, for 41-60 year old NMDP donors, 89% experienced any grade pain; 3%, grade 3-4 pain. Assessment at 1 month showed that 68% and 78% of older donors had returned to baseline pain and other symptom levels while 16% and 6% still reported grade 2-3 pain and symptoms, respectively (NMDP recovery: 96% at 1 month for both). Univariate analysis of the effect of gender, race, age, and baseline rates of pain and symptoms on G-CSF-related pain and symptoms, and return to baseline at one month was performed. Donors with grade 2-3 pain at baseline (only 3 donors had grade 3) were more likely to experience grade 2-4 pain (62 vs. 28%; p=0.001) and grade 2-4 symptoms (35 vs. 14%; p=0.01) on day 5 of G-CSF. Female donors showed lower rates of return
to baseline symptom levels at one month (72 vs. 85%, female vs. male; p=0.028). Race and ages 61-65, 66-70, and 71+ had no effect.

**Conclusions:** Related donors over age 60 have high baseline rates of pain and other symptoms. Their rate of any grade pain is lower but grade 3-4 pain is higher on the day of collection and recovery at one month is slower than noted in past studies of younger unrelated donors. Donors with baseline pain are at risk of experiencing higher levels of pain and symptoms during the collection process, and women recover more slowly than men. Additional analyses including baseline organ-specific comorbidities and multivariable analysis of risk will be presented with these data.

![Figure 1. Pain and Symptoms Pre-, During, and Post-Collection in Older Related Donors](image-url)
CIBMTR DS09-04

THE EFFECT OF RACE, SOCIOECONOMIC STATUS, AND COLLECTION CENTER SIZE ON BONE MARROW AND PBSC DONOR EXPERIENCES

PROTOCOL

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1.0 HYPOTHESIS:

1.1 Though gender differences may persist, rates of CALGB/CTC toxicities, levels of pain, and percentage of patients experiencing severe or unexpected events after BM and PBSC donation will not vary based upon the donor’s reported race.

1.2 Rates of CALGB/CTC toxicities, levels of pain, and percentage of patients experiencing severe or unexpected events after BM and PBSC donation will not vary based upon perceived SES status as ascertained by local zip code.

1.3 Rates of CALGB/CTC toxicities and levels of reported pain will be similar in larger vs. smaller centers, but levels of severe or unexpected events after BM and PBSC donation will be increased at smaller centers.

2.0 SPECIFIC OBJECTIVES:

2.1 Compare early donation associated toxicities (grades II-IV CALGB/CTC toxicities, peak levels of pain) in donors of BM and PBSC between:
   - Donors reporting themselves as Hispanic, non-Hispanic Asian/non-Hispanic Pacific Islander, non-Hispanic Black, and non-Hispanic other races with non-Hispanic Caucasian donors,
   - Donors living in low SES census tracks vs. middle SES census tracks vs. high SES census tracks. Donors from donor centers 087, 109, 125, and 126 will be excluded due to large number of missing SES due to non-residential or missing address.
   - Donations performed at centers of different sizes, cut points to be determined by data.

2.2 Compare BM collection associated toxicities (need of allogeneic red cells, etc.) for the groups outlined above.

2.3 Compare apheresis collection associated toxicities (need for placement of a central line, significant bleeding, etc.) for the groups outlined above.

2.4 Compare percentage and types of serious unexpected or life threatening adverse events after BM and PBSC for the groups outlined above.

2.5 Compare time from donation to report of complete recovery for the groups outlined above.

2.6 Describe specific BM and PBSC specific outcomes (such as anesthetic duration, collection volume, collection volume per kg of donor weight, total volume of whole blood processed, central line placement, etc.).

3.0 SCIENTIFIC JUSTIFICATION:

Recent publications have described in detail acute toxicities associated with volunteer unrelated donation of BM and PBSCs. The peak of toxicities occurs at different time points for BM and PBSC and is well understood. For BM donors, increased risks for toxicities have been noted in older donors, women, and those who used local anesthetics. For PBSC donors, increased risks of side effects were documented in women and obese donors. These studies form a baseline for further study in this area.
Studies have demonstrated lower thresholds to pain in Hispanic and African American patients; one study linked the differing pain thresholds to differences in oxytocin levels in African Americans. Other studies have shown that chronic pain differences in ethnic groups disappear when variables are appropriately controlled. Understanding whether there is a difference in pain risk during the process of donation based upon ethnicity could assist donor centers in advising donors prior to donation and appropriately treating donors during the process. Studies have also linked pain risk to SES status, and a study looking at risk of adverse events and pain in different SES groups could similarly benefit donors and donor centers who council them.

Finally, donor, collection, and apheresis centers vary tremendously in volume and experience. To date, a comprehensive study looking at the toxicity outcomes of donors has not looked at the variable of center size and experience. Such a study is important to the NMDP to assist in accreditation and quality control of centers.

4.0 STUDY POPULATION:

The study population will include all NMDP donors of BM and PBSC from January 1, 2004 to July 31, 2009. Second donations will be excluded. Donors donating at international apheresis centers will be excluded.

5.0 OUTCOMES:

5.1 Undesired but not uncommon adverse events: Incidence of collection-related AEs within the first 30 days after collection, such as: citrate toxicity, incidence of overnight hospitalization (>1 night for BM, and 1 or >1 for PBSC), receipt of allogeneic red cells, and placement of a central line for the collection procedure.

5.2 Serious adverse events: Events that were fatal or life threatening or resulted in prolonged hospitalization immediately associated with or as a direct result of the collection procedure. Permanent disability, congenital abnormality, cancer, or death occurring at any time after the collection procedure that is possibly, probably, or definitely associated with the collection procedure and/or G-CSF administration.

5.3 Long-term pain or disability: Pain or disability associated with donation that has not returned to baseline by 1 month and 1 year post-donation.

5.4 Bone pain: Maximum severity of bone pain will be assessed during the time period from day of collection to 2 days post-donation for BM donors and from Day 1 of filgrastim administration to day 1/day 2 of apheresis for PBSC donors.

– Incidence of highest severity of bone pain during the time period outlined above of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II

– Incidence of bone pain at 2 days post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II

– Incidence of bone pain at 1 week post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II

– Incidence of bone pain at 1 month post-donation of grade II-IV vs. grade 0-I; and of
5.5 **Common toxicities:** Levels for the following toxicities will be assessed using Modified Toxicity Criteria: fever in the absence of signs of infection, fatigue, skin rash, local-site reaction, nausea, vomiting, anorexia, insomnia, dizziness, and syncope. Peak toxicity level for each of the above symptoms will be assessed from day of collection to 2 days post-donation for BM donors and from Day 1 of filgrastim administration to day 1/day 2 of apheresis for PBSC donors. Highest toxicity level across all body symptoms will be assessed at each time point and during the time period outlined above.

- Incidence of highest level of body symptom during the time period outlined above of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II
- Incidence of body symptom at 2 days post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II
- Incidence of body symptom at 1 week post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II
- Incidence of body symptom at 1 month post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II
- Incidence of highest toxicity level across all body symptoms during the time period outlined above of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II
- Incidence of highest toxicity level across all body symptoms at 2 days post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II
- Incidence of highest toxicity level across all body symptoms at 1 week post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II
- Incidence of highest toxicity level across all body symptoms at 1 month post-donation of grade II-IV vs. grade 0-I; and of grade III-IV vs. grade 0-II

5.6 **Bone Marrow donation specific outcomes:**

- Anesthetic duration: cut points to be determined; median (range) in minutes: 90 (26-248)
- Collection volume: < 1 L vs. 1-1.5 L vs. ≥ 1.5 L
- Collection volume per kg of donor weight: < 10/kg vs. 10-15/kg vs. 15-20/kg vs. ≥ 20/kg

5.7 **PBSC donation specific outcomes:**

- Total volume of whole blood processed on both days of collection: small (< 12 L) vs. standard (12-18 L) vs. large (18+ L)
  - Volume of whole blood processed for day one of collection: small (< 12 L) vs. standard (12-18 L) vs. large (18+ L)
  - Volume of whole blood processed for day two of collection: small (< 12 L) vs. standard (12-18 L) vs. large (18+ L)
- Central line placement for either day of collection: yes vs. no
- Duration of apheresis procedure: cut points to be determined; median (range) in hours: 1 day collections: Day5 – 4.75 (0.25-12.92), 2 day collections: Day 5 – 3.62 (0.42-8.82), Day6 – median 3.4 (0.53-6.87)
- Incidence of hypocalcemia for either day of collection: yes vs. no

5.8 **Time to recovery:**

- Time from donation to report of complete recovery
6.0 VARIABLES TO BE ANALYZED:

Main effects:
- Race/ethnicity: Black vs. Hispanic vs. Caucasian vs. other
- SES status, based upon 2012 US Census median household income for census block (or zip code if street addressed wasn’t matched) used at donation: ≤ 30,000 vs. 30,001-40,000 vs. 40,001-55,000 vs. 55,001-80,000 vs. >80,000 vs. unknown/missing
- Collection center size, by quartiles for number of BM harvests during study time (January 1, 2004 to July 31, 2009): 1-35, 36-72, 73-118, ≥ 119
- Apheresis center size, by quartiles for number of PBSC collections during study timeframe (January 1, 2004 to July 31, 2009): 1-85, 86-139, 140-217, ≥ 218

Donor related:
- Age at donation: 18-29, 30-39, 40-49, 50+
- Gender: female vs. male
- Weight/body mass Index: underweight vs. normal vs. overweight vs. obese
- WBC at baseline
- Platelet count at baseline
- Hemoglobin at baseline
- Neutrophil counts at baseline
- Mononuclear cell count at baseline
- CMV Status: reactive, nonreactive, unknown/indeterminate

Collection related:
- Year of procedure
- BM specific
  - Type of anesthesia: epidural, general, local, spinal, unknown
- PBSC specific:
  - Number of apheresis procedures for each donation: 1 vs. 2

7.0 STUDY DESIGN:

The effect of race/SES/center size will be analyzed separately for PB and BM donations. Descriptive tables of donor- and collection-related variables will be prepared by the main effects. Variables will be compared between independent groups using the Chi-square test for categorical variables and the Kruskal-Wallis test for continuous variables. Adverse events, bone pain, and body symptoms will be described using frequencies and percents, and probabilities of complete recovery from donation will be calculated using the Kaplan-Meier estimator.

Logistic regression will be used to analyze the impact of each main effect on select outcomes (grade 2-4 or 3-4 toxicity, bone pain, and body symptoms where there are sufficient numbers of events for multivariate analysis) while adjusting for differences in donor characteristics. Stepwise model building will be used with a significance level of 5%. Because center size is a center level covariate, we will account for within center correlation using a random effect for center in the logistic regression model. A multivariate model for time to complete recovery will
be constructed using Cox regression, with stepwise model building at a 5% significance level. The proportional hazards assumption will be assessed using time dependent covariates or graphical approaches. The within center correlation will be accounted for using a frailty Cox model with a random effect for center.

8.0 REFERENCES:


Influence of race and ethnicity on the collection of G-CSF mobilized peripheral blood stem cells from unrelated donors, a CIBMTR analysis.

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Peripheral blood stem cell (PBSC) collection is increasingly used in allogeneic stem cell transplantation. However, a small percentage of healthy donors have a poor mobilization response to G-CSF. Very little information exists on the effect of donor race or ethnicity on PBSC mobilization. We analyzed 10776 unrelated donors from the National Marrow Donor Program (NMDP) who underwent G-CSF mobilized PBSC collection from 2006–2012. We investigated the effect of self-reported donor race/ethnicity on collection efficiency, defined as number of CD34+ cells/L (of donor blood processed), number of mononuclear cells (MNC)/L and CD34+ cells/MNC collected on the first day of apheresis. Categorical variables were analyzed by the Chi-square test and the Kruskal-Wallis test was used for continuous variables. A linear regression model was used to compare the various race/ethnic groups while controlling for potential confounding factors (such as age, BMI, gender, and year of apheresis). The result of our analysis is shown in Table 1. Univariate analysis revealed statistically significant differences in CD34+ cells/L, MNC/L and CD34+/MNC in all races analyzed. In general, African Americans (AA) had the highest collection efficiency while Caucasians had the lowest. Other races/ethnicities had collection efficiencies between the two groups. On multivariate analysis, statistically significant differences in CD34+ cell/L were seen in Hispanics, AA and Asian/Pacific Islanders (API), primarily in the obese (Hispanic, AA, API) and overweight (AA, API) donors. In the API group the differences in collection efficiency were predominately seen in males. No differences were seen between Caucasians and Native Americans. This study reveals significant racial/ethnic differences in the efficiency of collection of CD34+ cells in unrelated donors. Although these differences do not appear to interfere with the ability to collect adequate numbers of PBSC, it is currently unknown why they exist. This is an area for continued research.
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Study Proposal 1311-30

Study Title:
Survey of the care and management of adult related allogeneic SC donors in the US

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Hypothesis:
Related donor practice in the United States is varied, with respect to medical eligibility criteria employed during assessment, consent procedures and donor follow-up. Recent efforts to improve consent procedures (conflict of interest) are likely to have resulted in changes in practice.

Specific Aims:
1. To determine how practice has evolved since the implementation of the current FACT standards (5th edition), and following publications that heighten awareness around related donor care.
2. To investigate the consistency in medical eligibility criteria used to assess related donors, and to determine how closely these mirror the WMDA/NMDP unrelated donor criteria.
3. To investigate the views of US transplant physicians regarding potential pathways for related donor management that could harmonize US practice.

Scientific Justification:
A previous CIBMTR survey investigated the practice patterns of related donor care.1 The group performed a survey in 2007-2008 of 222 teams with 98 evaluable responses and reported that in >70% centers, the same physician caring for the donor had either simultaneous responsibility for, or might be involved in the care of, the recipient, and that 5% centers had no written criteria for related donors.

Since the time of that survey, studies in other countries worldwide have addressed the subject of related donor care, and resultant changes in regulatory standards have been made.

There are indications that donations in a related donor setting are less safe than those of unrelated donors. A retrospective study by EBMT 1993-2005 described 5 donor deaths in 36317 family donations, while no deaths occurred in 14706 donations from volunteer unrelated donors.2 Project NOTIFY, in 2011 identified a further 4 deaths in related donors in the USA, and a fatality in a 7-year old PBSC donor in Brazil.3 Since these reports are retrospective it is difficult to speculate on true incidences of severe adverse reactions in family donors but we can conclude that robust screening can reduce fatal complications. This compares to only one reported death of an unrelated donor (WMDA S(P)EAR).

FACT standards and WHO guiding principles state that centers assessing family donors must have written criteria for their evaluation, however no examples of globally accepted medical eligibility criteria for family donors currently exist. It has been suggested that assessment should be in keeping with that of unrelated donors due to an increased incidence of adverse reactions in family donors not meeting the criteria of unrelated donors. A Dutch single-center cohort study of 268 donors found that related donors who do not meet acceptance criteria for unrelated donors had a higher incidence of cardiovascular
events, indicating smaller safety margins. A Japanese study of 3188 sibling PBSC donors also showed a significantly increased incidence of SAEs in donors not meeting JSHCT standards.

Currently, most centers do not use national UD criteria to assess their family donors; an Italian survey showed that only 26.4% donors underwent thorough screening according to Italian Bone Marrow Donor Registry standards, while local protocols were applied to 73.6%. To date, no studies have investigated the medical eligibility criteria with which related donors are evaluated in the US.

Historically, as shown by O’Donnell et al, related donors have been assessed and consented by transplant physicians, who may be simultaneously involved in the management of the transplant recipient. European studies have echoed these findings. An EBMT nurses group survey found that in 52% centers, donors were consented by transplant doctors, whilst in only a quarter of centers was consent obtained by doctors who were not connected with the transplant team.7 In 2012, Coluccia et al published a study in which they analyzed the data of 500 related donor candidates in Italy; the authors concluded that in 4/9 centers donors and recipients were managed by the same physician (44.4%), and that peri-donation care was provided by apheresis physicians in 3/9 centers and by transplant physicians in 6/9 centers. The issue of independent donor assessment has been addressed in current FACT-JACIE standards which now require that “Allogeneic donor suitability should be evaluated by a physician who is not the physician of the recipient” while WHO principles state that assessment should be carried out by “an appropriately qualified independent party”. It will be important to determine whether practice has changed as a result of this guidance.

Recent papers have also focused on the importance of donor follow-up. In 2011 the NOTIFY report recommended serious adverse reaction reporting for family donors along with long-term follow up for at least 10 years. WBMT made similar recommendations for a standardized approach to prospective donor follow-up to 10 years for all donors with a minimal data set, and the need for follow-up has again been recognized in current FACT standards which require ‘a policy for follow-up of donors that includes routine management and the management of collection-associated advents.’ European studies suggest that currently donor follow-up is limited. The Research Subcommittee of the EBMT Nurses Group found that 60% of the responding centers identified a follow-up service; however, of these, 6 (10%) responses indicated only limited follow-up provision, and 2 centers offered no follow-up care at all.7 (Italian et al) reported that all centers followed up donors to one week post-donation but only 5/9 centers offered follow-up beyond a year post-donation. As yet, no studies have examined the practice of related donor follow-up in the US.

Implementation of some of the above regulatory guidance can prove challenging to transplant centers, particularly around the logistics of independent family donor care and the institution of a system for 10 year donor follow up. We therefore plan to explore the views of US transplant physicians with respect to possible management pathways where parts or all of family donor management is performed by an organization separate to the transplant center.

We hypothesize that at present, diverse medical eligibility criteria are employed, and that transplant centers (as per the findings of European studies) have logistical difficulties in meeting regulatory guidelines for donor follow up and independent assessment of donors. The findings of this study will inform areas that need to be addressed in current practice and the opinions that are gauged from transplant physicians in this survey will form a basis for discussion and ideas of how to enhance and homogenize related donor care in the US and worldwide.
Study Population:
Centre directors of CIBMTR adult allogeneic transplant member centers

Data Requirements:
This study does not require examination of CIBMTR data.

Sample Requirements:
This proposal does not require biologic samples.

Study Design:
The objectives will be to determine whether transplant centers are able to meet regulatory standards and whether there is a variation in eligibility criteria used to assess related donors in the US. A secondary outcome will be to investigate the views of US transplant physicians with regard to other potential models of related donor care.

This survey will be conducted as an internet-based questionnaire which will be administered via a secure website (SurveyMonkey.com). Invitations to the survey will be sent initially to directors of transplant in each US center responsible for recipients of allogeneic stem cell transplants. In the event of failure to respond, other transplant physicians in the same center will be sent a survey invitation, but for the purpose of analysis only one completed survey from each center will be considered.

Descriptive analyses will be made on characteristics of related donor management by transplant centers and comparisons will be made between eligibility criteria employed in related donor care and the criteria used by WMDA/NMDP to evaluate unrelated donors.

References:
Survey of the medical management of related donors in the US

Questions about the logistics of donor care at your center
1. How many related donors does your center typically assess per year?
   a) 0-5
   b) 6-10
   c) 11-15
   d) 16-20
   e) >20

2. How many transplant consultants are involved in care of adult transplant recipients at your center?

3. Is your center FACT accredited?
   a) Yes
   b) No

4. Do you have a written policy for the assessment and care of related donors?
   a) Yes
   b) No

5. Do you have a stem cell lab on site?
   a) Yes
   b) No

6. Is apheresis done on site?
   a) Yes
   b) No

7. Is bone marrow harvest done on site?
   a) Yes
   b) No

Questions about Initial donor counseling
8. What Information is shared with potential related donors prior to tissue typing?
   a) Verbal communication
   b) Locally written information
   c) Written information from a national source (please specify)

9. Is there an assessment of donor health prior to tissue typing
   a) Written health questionnaire
   b) Health questionnaire completed over the phone
   c) Verbal discussion with open-ended questions
d) None  
e) Other (please specify) _____________

10. Who makes initial contact with a related donor prior to tissue typing?  
a) Transplant physician  
b) Other physician  
c) Transplant specialist nurse  
d) Other nurse  
e) Other (please specify) _____________

12. Who is told first when a matched family donor is found?  
a) The donor  
b) The recipient  
c) No consistent practice

13. Who undertakes medical assessment and consent of the donor  
a) The transplant physician caring for recipient  
b) A different transplant physician from the same team  
c) A physician from a different team within your center  
d) A physician from another center/organization  
e) Other (please specify) _____________

14. Do related donors at your center have a donor advocate? (an individual distinct from the transplant recipient’s primary treating physician who works to fully inform the donor of the collection procedure and promotes the interests, well-being, and safety of the donor?)

15. Do you have a written policy for dealing with conflicts of interest?  
a) Yes  
b) No

Questions about the donor medical evaluation
16. Does your unit have written/defined eligibility criteria for related donors?  
a) Yes  
b) No

If yes  
17. Where are these criteria derived from?  
a) Locally created  
b) Based on NMDP criteria  
c) Based on WMDA criteria

18. Do you use a health/lifestyle written questionnaire as part of your donor assessment?  
a) Yes  
b) No
19. Regarding the following donor characteristics (tick all that apply)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Our center has criteria</th>
<th>I think there should be defined criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>BP</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Maximum BMI</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Minimum weight</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Deferral following tattoos/piercings</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Deferral following transfusions</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

20. Do you accept related donors with the following medical conditions?

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Diabetes mellitus</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>on oral hypoglycaemics</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b) Diabetes mellitus on insulin</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c) Asthma on tablet medication</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d) Previous ischaemic heart disease</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e) Systemic autoimmune disease</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

21. In which situation are the following investigations performed?

<table>
<thead>
<tr>
<th>Investigation</th>
<th>On all donors</th>
<th>On specific populations</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) CXR</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>b) ECG</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c) US Abdomen</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>d) Hbpathy testing</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e) Urinalysis</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f) ECHO</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g) Bone marrow aspirate</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

22. Which of the following blood tests are performed routinely on all donors at your center (in addition to required virology)?

a) FBC
b) Coagulation
c) Renal profile
d) Bone profile
e) TFTs
f) Liver profile
g) LDH
h) ferritin
i) C3/4
j) ESR
k) Serum protein electrophoresis
l) Pregnancy test

Questions about PBSC donation
23. Who administers the GCSF

<table>
<thead>
<tr>
<th>1st dose</th>
<th>Other doses</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

24. Which GSCF do you use for stem cell mobilisation in your related donors?
   a) Lenograstim
   b) Filgrastim
   c) Biosimilar

25. Regarding plerixafor in related donors?

<table>
<thead>
<tr>
<th>Yes</th>
<th>Only in a clinical trial</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

26. Who has the medical responsibility for the apheresis procedure itself?
   a) A transplant physician
   b) A physician from other team/organization

27. Do you have a defined limit for the number of apheresis procedure a related donor will undergo for their initial donation?
   a) No
   b) Yes (please specify) ________________

28. Who are donors asked to contact if they develop complications during the mobilization period?
   a) The transplant team at your center
   b) Another team at your center
   c) Another healthcare provider (please specify) ________________

Questions about related bone marrow donation
29. Who performs bone marrow harvests at your center?
   a) The transplant team responsible for care of recipient
   b) Other transplant physicians
c) Another team

30. Do you have a defined limit for the amount of bone marrow to harvest?
   a) No, it is decided on a case by case basis
   b) Yes (please specify the limit) ____________________

31. During their in-patient stay where do related bone marrow donors stay?
   a) The same ward as their recipient
   b) A different ward
   c) We do not routinely keep bone marrow donors in overnight

32. Do related adult bone marrow donors routinely receive the following?

   a) Collection + return of an autologous unit ☐ ☐
   b) Collection of an autologous unit which is not routinely returned ☐ ☐
   c) A course of oral iron ☐ ☐

Questions about follow-up of related donors
33. At which of the following time points post-donation are your donors followed up?
   a) 1 week
   b) 30 days
   c) 1 year
   d) 2 years
   e) 3 years
   f) 4 years
   g) 5 years
   h) 6 years
   i) 7 years
   j) 8 years
   k) 9 years
   l) 10 years
   m) >10 years
   n) any other time points (please specify) ________________

34. How is donor follow-up performed at your center?
   a) By telephone
   b) By telephone initially then written questionnaire
   c) By written questionnaire
   d) Routine outpatient appointment
   e) Followed up by another healthcare provider
   f) We do not follow up our related donors
35. Who are donors asked to contact if they develop medical issues following their donation which may be potentially donation-related?
   a) The transplant team
   b) Other team at your center
   c) Another healthcare provider (please specify) __________________________

36. Do you have a written policy regarding subsequent donations at your center?
   a) Yes
   b) No

37. Is there a limit to number of subsequent donations at your center?
   a) No
   b) Yes (please specify the limit) __________________________

**Questions about potential models of related donor care**

38. How would you best describe current care of related donors in the US?
   a) extremely satisfactory
   b) satisfactory
   c) somewhat satisfactory
   d) unsatisfactory
   e) extremely unsatisfactory

39. If you feel care is unsatisfactory please explain why (tick all that apply)
   a) Potential conflicts of interest
   b) Lack of standardized medical eligibility criteria
   c) Follow-up is inadequate
   d) Workload is onerous for transplant centers
   e) Other, (please specify) __________________________

40. Do you think related donor safety would be improved if national/international eligibility criteria were created?
   a) Yes
   b) No

41. Do you think RD safety would be improved if national guidelines for the whole donation process were created?
   a) Yes
   b) No

42. Which (if any) of the following models do you feel could enhance related donor care in the US?
   a) Separate teams within a center would be responsible for medical assessment of RDs, care during the donation period and would arrange donor follow-up
b) Consent and donor follow-up by an external organization, with donation process performed by the transplant center

c) Donors would visit a geographical 'related donor hub' which would be responsible for the whole process of assessment/donation/follow-up

d) Donor registries would be responsible for the whole process of related donor assessment/donation/follow-up

e) None - there is no need for change

f) Another model (please specify)__________________

43. Which (if any) of the following models would be logistically possible at your center?

a) Separate teams within a center would be responsible for medical assessment of RDs, care during the donation period and would arrange donor follow-up

b) Consent and donor follow-up by an external organization, with donation process performed by the transplant center

c) Donors would visit a geographical 'related donor hub' which would be responsible for the whole process of assessment/donation/follow-up

d) Donor registries would be responsible for the whole process of related donor assessment/donation/follow-up

e) None - there is no need for change

f) Another model (please specify)__________________

44. Would you like to make any other comments about the care of family donors?

______________________________