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CENTER FOR INTERNATIONAL BLOOD & MARROW TRANSPLANT RESEARCH

Summary and Recommendations of the 2014 Center-Specific Outcomes Forum Held on June 24, 2014

Executive Summary

This year's Center-Specific Outcomes Forum was held June 24, 2014, following the "Defining Quality and Value in Stem Cell Transplant" meeting sponsored by the NMDP/Be The Match®. CIBMTR invited representatives of the HCT community, the ASBMT Quality Outcomes Committee, governmental funding agencies, patients, private payers, and statisticians to participate in structured brainstorming sessions around five key questions outlined by the organizing committee involving center-specific outcomes reporting. The key questions and main recommendations for each are briefly summarized below.

Which sociodemographic/socioeconomic status (SES) factors should be used in center-specific survival analysis beginning in 2016?

- Insurance status, zip code, race/ethnicity , level of education, and marital status were identified as both important and feasible for CIBMTR to consider collecting on all U.S. HCT recipients for inclusion in future risk adjustment models.

What reports can CIBMTR produce using existing data that will facilitate centers' quality improvement efforts?

- A broad range of reports of varying complexity were suggested. Functionality to compare an individual center's outcomes with data from other centers, such as all U.S. centers, a group of "similar" centers, or a group of high-performing centers, would add great value.

What are the characteristics of transplant centers with consistently high outcomes that may be adoptable by other transplant centers to improve or ensure transplant results?

- There was strong consensus that CIBMTR should continue to survey centers regularly to collect organizational and care delivery characteristics and disseminate these data for use in quality improvement and resource allocation. Additional important characteristics were suggested for inclusion in center surveys. CIBMTR should periodically analyze center characteristics and their association with clinical outcomes.

Are there new measures of quality not currently reported publicly by the CIBMTR which should be included in future iterations of the center-specific survival analysis (with risk adjustment) on behalf of the HCT community?

- Long-term (3 year) risk-adjusted overall survival was recommended as an additional outcome measure for future analyses. The feasibility of collecting and reporting patient-reported outcomes should be further assessed by CIBMTR.

Which cellular infusion types should be considered in the CIBMTR center-specific survival analysis?

- CIBMTR should continue to use traditional HCT as the focus of the center-specific survival analysis for reporting on center performance for quality improvement efforts in the United States. In addition, information regarding indications and utilization of cellular therapies should be collected to maintain surveillance of the field and conduct research.

Background

In 1986, the National Bone Marrow Donor Registry (managed by the National Marrow Donor Program® (NMDP®) was established, with responsibility for the maintenance of an unrelated donor registry for hematopoietic cell transplantation (HCT). In 1990, the Transplants Amendment Act made the reporting of center-specific outcomes for unrelated donor HCT mandatory in the United States. This activity was conducted by the NMDP from 1994 through 2007. With the Stem Cell Therapeutic and Research Act of 2005, the requirement to report outcomes of HCT by transplant center was broadened to include all allogeneic (related and unrelated) HCTs in the United States. This responsibility rests with the contractor for the Stem Cell Therapeutic Outcomes Database, the Center for International Blood and Marrow Transplant Research® (CIBMTR®).

During the transition phase of the C.W. Bill Young Cell Transplantation Program, CIBMTR, working with the NMDP, the American Society for Blood and Marrow Transplantation (ASBMT) and the Health Resources and Services Administration (HRSA), held a meeting to review the current approach to center-specific outcomes reporting and to provide recommendations for future reports in the expanded Program. With this purpose, CIBMTR invited representatives of the HCT community (national and international), the ASBMT Quality Outcomes Committee, governmental funding agencies, the solid organ transplant community, patients, private payers, statisticians and experts in hospital and quality outcomes reporting to Milwaukee, Wisconsin, in September of 2008.

The objectives of the initial meeting were to review the current state of center-specific outcomes reporting in medicine and transplantation and to openly discuss strengths and limitations of current approaches with the goal of developing recommendations for HCT center-specific outcomes reports that would be:

- Scientifically valid;
- Equitable;
- Free from bias;
- Useful to the HCT community for improving quality;
- Informative for the public.

One of the recommendations of the 2008 meeting was to conduct regular reviews with a broad group of stakeholders of the process, methodology, data collection and risk adjustment, and reporting. Based on that recommendation, the “Center-Specific Outcomes Forum” was established in 2010 and has been held every other year since then to consider the CIBMTR center-specific survival analysis. Summaries of these meetings are available at (http://www.cibmtr.org/Meetings/Materials/CSOAForum).

Meeting Summary

This year's Center-Specific Outcomes Forum was held June 24, 2014, following the "Defining Quality and Value in Stem Cell Transplant" meeting sponsored by the NMDP/Be The Match®. The perspectives presented by national experts on approaches to measurement of quality and improving value for patients provided an excellent background for the Center-Specific Outcomes Forum. A summary is available at (https://payor.bethematchclinical.org/Stay-Connected/).

A broad range of invited stakeholders (see Appendix A) were organized into six representative groups to participate in structured brainstorming sessions around five key questions outlined by the organizing committee. The small groups independently developed responses to each key question, and then prioritized their suggestions. Moderated group discussion was used to summarize the responses and develop consensus priorities and recommendations for the CIBMTR.

A summary of the discussion and recommendations from this meeting, organized by key question, follows.

Key Question 1: Which sociodemographic/socioeconomic status (SES) factors should be used in center-specific survival analysis beginning in 2016, with group consensus on their value and importance and recognizing balance of benefit and burden of data collection?

Socioeconomic status and health literacy impact health outcomes. They are important determinants of outcome of hematopoietic cell transplantation (HCT) and there is increasing interest in expanding collection of these data for use in the multivariate adjustment models used for the center-specific survival analysis.

A report from the National Quality Forum[1] was used as a discussion guide for this topic. The workgroups considered which sociodemographic factors could be collected to better adjust outcomes in the multivariate models. There was considerable debate regarding the value relative to the degree of effort necessary to collect and report these data. Discussion focused on identifying high-value fields that could be reported consistently by centers (Table 1).

The groups rated the following factors as having the highest value: household income or its proxies (Medicaid or income in relation to federal poverty level), English language proficiency, insurance status, social support, and literacy/health literacy. Variables considered the easiest to implement were: Medicaid status as proxy for low income, lack of insurance, employment status, race/ethnicity of the patient, and neighborhood of residence using zip code (see Table 1).

TABLE 1: Sociodemographic concepts that could be considered for risk adjustment modeling; rating assessed by workgroups

Factors/concepts (specific variables)[1]	Value *low # = high value* *Scale 1-5*	Difficulty to implement *low # = easier* *Scale 1-5*
Income	1.25	2.5
• Income in relation to federal poverty level	1	3.17
• Household income	1	2.67
• Medicaid status	1.33	1.14
• Social Security Supplemental Income (SSI)	3	1.83
Education level attained	1.67	1.17
Homelessness	3	2.25
• Housing instability	2.8	3.33
English proficiency	1.33	1.57
Insurance status	1.4	0.5
• Medicaid status	1.33	1
• No insurance	1	0.67
Neighborhood of residence as determined by zip code	1.25	0.5
• Contextual-Proportion vacant housing	2.4	2.2
• Contextual-Crime rate	2.4	2.2
Social support	1	4.88
• Living alone	2.2	2
• Marital status	2.25	1.25
Occupation	2.8	1.2
Employment status	2.4	0.6
Literacy	1.2	3.5
Health literacy	1	3.67
Local/state funding for safety net providers (e.g., tax base)	2.2	2.5
Race/ethnicity	1.29	0.67

Income was generally considered to be an important, high value factor associated with outcomes of HCT. There was consensus that household income was the most relevant indicator, rather than individual income, but these data were thought to be difficult to collect consistently. Medicaid status, which is indexed to income based upon the federal poverty level, was thought to have reasonable value

[1] Adapted from *Risk Adjustment for Socioeconomic Status or Other Sociodemographic Factors*. Washington (DC): National Quality Forum (US); 2014 Aug 15. 88 p. Contract No.: HHSM-500-2012-000091. Supported by the Department of Health and Human Services.

and could be collected consistently across centers. It is a reliable indicator of household income near or below the federal poverty level.

Zip code (+4) is also a proxy for income. Zip code alone is less discriminating and may include significant heterogeneity within any specific region/tract. However, as a general measure of income compared to the poverty level, income inferred from zip code is of value. It has the added advantage of being useful to determine distance from the transplant center or other medical facilities, which may also impact HCT outcome. Zip code has been collected by the CIBMTR for all U.S. recipients since October 2013.

Race/ethnicity of the recipient is already collected by the CIBMTR and used for the center-specific survival analysis. There are, however, inconsistencies in data collection practices across U.S. HCT centers, and education to standardize collection of race/ethnicity data may be beneficial.

Level of education achieved by the recipient was considered of high value by the groups. Education level is generally associated with income. Education level is also related to occupation and to health literacy, though it may not be fully associated with English literacy. Education could be measured in a few categories (e.g. completion of high school, completion of baccalaureate degree, post-baccalaureate studies) with relatively standard definitions and modest effort.

The related concepts of *health literacy* and *English proficiency* were considered to be important, but very difficult to collect systematically at transplant centers. The recipient's need for translation services could be collected, but there may be heterogeneity in engagement of such services depending upon the language spoken by the patient (Arabic vs. Spanish) and availability of those services. This would likely affect consistency of reporting across centers.

Current occupation was considered to be less easily ascertained and would present difficulties when considering individuals who are retired. Collection of employment status is limited by the confounding influence of a serious illness and need for transplant such that "current" status does not reflect "usual" status, i.e., before onset of illness. It also does not accommodate patients who are students, homemakers, or recently employed.

Insurance status may be valuable to understand for purposes of risk adjustment, in broad categories. These categories include Medicaid, Medicare, "self-pay", and commercial insurance. However, most patients who receive an allogeneic HCT have resources greater than a minimum threshold, and these broad categories may not sufficiently discriminate differences in coverage that may exist and affect outcomes (e.g. pharmaceutical benefit). "Self-pay" patients include the wealthy international "medical tourism" patients as well as working poor with no health insurance. Sufficient detail to meaningfully incorporate insurance status in risk adjustment models would be useful, but difficult to acquire.

The group agreed that *social support* was a moderately important factor. Capturing marital status is relatively straightforward, whereas systematic collection of living situation or other details of social support was deemed not feasible. Similarly, presence of a caregiver to provide support after HCT is a valuable measure of social support that may affect outcomes. While it is a condition for HCT at many centers, it was considered difficult to collect systematically. Some participants believed that, having the

means to receive a HCT at most centers was a reasonable proxy for sufficient social support and caregiver resources. This was a minority opinion.

Recommendations:

The group identified the following sociodemographic data fields as both important and most feasible for CIBMTR to consider collecting on all U.S. HCT recipients for inclusion in future risk adjustment models:

- Insurance status (Medicaid, Medicare, commercial, 'self-pay', un-insured)
- Zip code
- Race/ethnicity (already collected and included)
- Level of education
- Marital status

Key Question 2: What reports can CIBMTR produce using existing data that will facilitate centers' quality improvement efforts?

CIBMTR collects substantial information about each allogeneic HCT recipient and these data are a valuable resource for centers to use to better understand and improve their outcomes. Potential reports of varying complexity that CIBMTR might produce for centers were discussed.

Simple reports using center-specific information might include:

- 100-day survival by year of transplant
- One-year survival estimate by year of transplant (identify yearly trends)
- One-year Kaplan Meier survival curves (graphically demonstrate the timing of deaths)
- Center-attributed cause of death with specific CRIDs for each deceased patient to facilitate review
- Tables showing the distribution of covariates used in the final model
- Standard, individual center datasets with the variables used in the center survival analysis for individual centers' analysis and quality improvement efforts.

Outcomes would be reported together with national data for all transplant centers.

Reports of **moderate** complexity include:

- Reports to allow centers to review the accuracy and completeness of data fields that are included in the risk adjustment models
- Tables comparing patient, disease, and relevant transplant characteristics from year to year
- Tables showing the full distribution of comorbidity scores (not just the numeric category) and factors
- Tables comparing demographics or sociodemographic factors by center with a group of high-performing centers

- Tables to highlight key differences in characteristics of individual centers compared to high-performing centers.

Suggested reports of **high** complexity include:

- Describe deaths that were 'disproportionate' to the expected survival – that is deaths in patients whose predicted survival was high, or reports that highlight the patients at a center who died out of proportion to national expectations based on normative national data.
- Survival outcomes stratified by particular HCT complications (limited to those collected on all recipients)
- Reports to differentiate outcomes in standard or good-risk patients (TBD) and high-risk patients at each center compared to all centers.
- Incidence of graft-versus-host disease (GVHD), treatment-related mortality (TRM) and relapse adjusted for relevant risk factors
- Tools to allow centers to create a 'custom' comparison group with several representative centers (without creating competitive intelligence)
- "Benchmark" reports that compare outcomes for a particular group of patients for whom HCT is commonly performed (e.g., a report summarizing national outcomes for one or two categories of HCT for AML in CR1 and corresponding individual center outcomes).

Even for common indications, benchmark reports are limited by small numbers of eligible subjects at many transplant centers, which limits power. These and other limitations have led to recommendations against benchmarking reports in all previous Center-Specific Outcomes Forum meetings.

Currently available standard reports for centers include:

- Unadjusted 100-day survival by year of HCT
- Unadjusted 6-month survival by year of HCT
- Unadjusted 1-year survival by year of HCT
- Tables of patient, disease, and transplant procedure characteristics for each of the three years included in the analysis sorted by related and unrelated transplant type.

Delivering a copy of each center's most recent auditing results with the center-specific survival analysis report was recommended as one possible data quality 'report'.

<u>Recommendations</u>:

The ability to compare an individual center's outcomes with data from other centers, such as all U.S. centers, a group of similar centers or a group of high-performing centers, would add great value to existing reports. CIBMTR is developing plans to further expand centers' accessibility to their own data, as well as provide high-value reports for transplant center leadership. CIBMTR Scientific and Statistical staff will use the recommendations provided during this session to guide future data sharing initiatives.

Key Question 3: What are the characteristics of transplant centers with consistently high outcomes that may be adoptable by other transplant centers to improve or ensure transplant results? After reviewing the CIBMTR Center Characteristics Survey, on a scale of 1-5 (where 5 is greatest value), how valuable would it be for CIBMTR to perform an analysis to associate these center-based factors with outcomes performance?

Centers are interested in learning more about how to optimize resource allocation for their transplant program to ensure good outcomes. Characteristics of interest include physician, nursing, pharmacist and data professional staffing.

There was very strong consensus that collection of center characteristics to associate with outcomes of HCT programs was valuable. Five of 6 brainstorming groups rated this activity as very valuable (5 of 5), one group considered the value modest. CIBMTR has published research studies on this topic and the data has been used by center directors to understand staffing models and resource allocation.

Suggestions for additional characteristics to collect on future center surveys included:

Provider Staffing:

- Experience of mid-level providers
- Experience of physicians
- Experience of current program leadership
- Center-specific years of experience
- Recent (< 3 years) change in program leadership
- Turnover of all providers at center
- Composition of outpatient team (non-HCT providers), e.g., ID, GI, Pulmonary, Dietary services
- Availability of dedicated inpatient Pharm. D.
- Availability of dedicated outpatient Pharm. D.
- Availability of dedicated social worker
- Inpatient nurse: patient ratio

Quality improvement (QI) processes:

- Integration of HCT and hospital QI efforts
- Availability of dedicated QI manager
- Regular quality management training of staff
- HCT-specific quality management dashboard and frequency of dissemination
- Readily accessible, regularly updated, high-quality standard practice manual
- Clearly defined processes to measure adherence to SOPs

Data Quality processes:

- Process to review integrity of data submitted to CIBMTR/Quality Assurance

- Data managers housed in formal clinical trials office
- Data quality review and improvement processes in place
- Procedures to train and update data management staff

Patient and care processes:

- Defined, program-specified patient selection process – has it changed, is it defined and reviewed, are all patients considered, consideration of predicted risk factors?
- Defined, program-specified donor selection criteria, e.g. HLA, graft type, other factors
- Psychosocial evaluation required for all patients or patients meeting pre-specified criteria?
- Patient education processes and consistency
- Care coordination efforts in first 100 days and defined process of transition to community providers
- Availability of on-site 7 day per week (defined as >6 hours daily) outpatient infusion capabilities
- Are inpatients exclusively cared for on inpatient units with BMT-specific expertise?
- Availability of patient and family support services
- Availability of long-term survival clinic and defined processes for providing long-term follow-up care.

Research as a proxy of quality:

- % patients on clinical trials
- Distribution of national vs. investigator-initiated (internal) clinical research

Recommendations:

- CIBMTR should continue to survey centers regularly to collect organizational and care delivery characteristics and disseminate these data for use in quality improvement and resource allocation.
- CIBMTR should use the guidance developed during this discussion to incorporate new questions in its next survey of centers.
- CIBMTR's Health Services and International Studies Working Committee should continue to periodically analyze center characteristics and their association with clinical outcomes.

Key Question 4: Are there new measures of quality not currently reported publicly by the CIBMTR which should be included in future iterations of the center-specific survival analysis (with risk adjustment) on behalf of the HCT community?

Several outcome and process measures were proposed for future center-specific survival analysis.

- Overall survival (risk-adjusted) at time points beyond 1 year
- Disease-free, immunosuppression-free survival (risk-adjusted)
- Freedom from immune suppression at 2 or 3 years after HCT

- Disease free survival (risk-adjusted)
- Incidence of chronic GVHD and severity (risk-adjusted)
- Central Line Associated Blood Stream Infection (CLABSI) incidence in the early post-HCT period
- Incidence of preventable infections at 1 year or longer after HCT (e.g., pneumonia, HSV)
- Cost of HCT/resource utilization by center
- Outcomes of autologous HCT (assumes complete reporting to CIBMTR of all centers)
- Patient-reported outcomes assessed 1 year or later after HCT
    - Formal measure of quality of life (QOL)
    - Return to work/productive life
    - Functional status/performance score at 2 or 3 years after HCT
- Process Measures
    - Time between referral for transplantation and transplant procedure for specified high-risk indications (e.g., acute leukemia with primary induction failure)
    - Availability of daily access to clinical care from experienced HCT clinicians
    - Use of specific practices to support long-term follow-up of survivors

Attendees were asked to prioritize their suggestions according to greatest value and ability to implement. The most common proposed measure was *overall survival at 3 years after HCT*. This accommodates patients' and a societal perspective for long-term survival and is relatively straightforward to measure and collect, though it does not directly reflect quality of survival or complications experienced by the patient. It has the disadvantage of requiring longer-term follow-up, a challenge for HCT centers. A second challenge is that a longer term endpoint does not necessarily reflect current practice. In its favor, transplant centers would be accountable for longer-term follow-up of their recipients, which may encourage development of better systems for transitioning care between transplant centers and community providers. However, those transitions are frequently complicated by things beyond the control of the transplant center, e.g. insurance issues, sociodemographic factors.

The next most commonly suggested measure was *disease-free, immunosuppression-free survival at 2 years after HCT*. There was discussion among the groups regarding the best means to capture survival without chronic GVHD and its sequelae. Absence (or presence) of active GVHD may be difficult for clinicians to determine in the setting of substantial tissue damage; whereas freedom from immunosuppression is simple, reportable and meaningful to patients and clinicians. It would not address quality of life (QOL) of survivors of GVHD or other complications. An essential component of this measure is the need to ensure consistent, high-quality reporting of long-term disease status after HCT by transplant centers.

The third most commonly suggested measure was *a long-term patient experience measure*. Proposals included a formal QOL measure at 1 or more years after HCT, Karnofsky performance score at 1 or more years after HCT, or resumption of employment. A formal QOL measure received the greatest endorsement. The proposed measures would require collection of baseline data for comparison, and methodologic consideration of reporting absolute status or change in status compared to baseline.

Functional measures would ideally be collected directly from patients, to acquire accurate data and reduce burden on centers.

Recommendations:

- CIBMTR should develop and test a longer term (3 year) risk-adjusted overall survival measure, introduced initially as a pilot for center use only.
- CIBMTR should continue to assess feasibility of collecting and reporting patient-reported outcomes.

Key Question 5: Which cellular infusion types should be considered in the CIBMTR center-specific survival analysis?

CIBMTR has limited the center-specific survival analysis, since its inception, to first allogeneic HCT using a traditional definition of HCT – a preparative regimen followed by cells for multi-lineage hematopoietic replacement or immune/metabolic system replacement in immunodeficiency or inherited metabolic diseases. As the field has evolved, transplant techniques have included infusion of isolated, specific hematopoietic cell types and new indications for treatment. CIBMTR sought input about which types of cellular infusion to include in its analyses to provide the greatest value for transplant centers and the field for quality improvement efforts.

There was clear agreement that CIBMTR should collect information on the broad array of cellular therapies and indications for their use. This includes Chimeric Antigen Receptor (CAR) T cells, viral-specific cytotoxic lymphocytes (CTLs), Natural Killer (NK) cell and other T-cell specific therapy, mesenchymal stem cells (MSC) and regenerative medicine and cardiac indications. CIBMTR should create and use definitions of cellular infusion types that are: easy to understand, easy to apply, readily discriminate categories/infusion types, and difficult to manipulate for advantage of a center. However, there was a strong consensus that the focus of the center-specific survival analysis remain traditional HCT.

Traditional HCT should continue to be the focus of the center-specific survival analysis because it:

- Is the most clearly defined indication
- Includes sufficient sample sizes for meaningful analysis and risk adjustment
- Has known expectations regarding outcomes
- Avoids disadvantaging centers using infusions for investigational therapy early in their development cycle.

Although a focus on traditional HCT does not include all allogeneic cellular infusions in the United States, it represents the majority of cellular infusions and the most reliable indicator of center quality that can be applied at this time. CIBMTR should incorporate the product type infused, as well as the purpose of the infusion in its definition of 'traditional HCT'. The guidance report developed by FACT and others[2] was recommended as a framework for that definition. Traditional HCT has multi-lineage engraftment or

replacement of a deficient or defective component of the hematopoietic system as the intent. Infusion of a product containing CD34+ cells is necessary but not sufficient without understanding the intent of the infusion.

A recent protocol, use of a CD34+ cord or a haplo-identical NK-selected cellular infusion after induction therapy for AML without GVHD prophylaxis (a protocol concept originating in China) was discussed to elaborate these concepts. Although CD34+ cells are infused, this protocol does not include a preparative regimen or GVHD prophylaxis and, therefore, is not expected to lead to hematopoietic engraftment from the donor. Its intent is to deliver short-term, cell-mediated graft vs. leukemia effects. There was general agreement that recipients on this protocol should not be included in the center-specific survival analysis. However, infusion of hematopoietic stem cells for severe combined immune deficiency, even in the absence of a preparative regimen, is intended as replacement of the immune system and is considered a traditional HCT. CIBMTR should consider a process where the American Society of Blood and Marrow Transplantation Quality Outcomes Committee or another similar group provides unbiased advice regarding interpretation of infusion strategies that are not straightforward or where HCT centers dispute the definitions for inclusion.

Criteria to determine inclusion of new indications/techniques of cellular infusion in future center-specific analyses should include sufficient:

- Sample size to accommodate multivariate adjustment
- Duration of utilization to be considered “not investigational”
- Experience to appropriately and clearly define the infusion type and anticipated outcomes.

Recommendations:

- Continue to broadly collect information regarding indications and utilization of cellular therapies to maintain surveillance of the field and conduct research.
- Use traditional HCT as the focus of the center-specific survival analysis for reporting on center performance for quality improvement efforts in the United States.

References

1. Risk Adjustment for Socioeconomic Status or Other Sociodemographic Factors. Washington (DC): National Quality Forum (US); 2014 Aug 15. 88 p. Contract No.: HHSM-500-2012-000091. Supported by the Department of Health and Human Services.

2. LeMaistre CF, Farnia S, Crawford S, et al. Standardization of Terminology for Episodes of Hematopoietic Stem Cell Patient Transplant Care. Biol Blood and Marrow Transplantation; 2013 June, 19(6):851-857.

Appendix A: Attendees of Center-Specific Outcomes Forum

Full Name	Organization	Representation
Robert Krawisz, MBA	American Society for Blood and Marrow Transplantation	ASBMT
Jeffrey Chell, MD	National Marrow Donor Program	CIBMTR
Pintip Chitphakdithai, PhD	National Marrow Donor Program	CIBMTR
Dennis Confer, MD	National Marrow Donor Program	CIBMTR
Roberta King, MPH	National Marrow Donor Program	CIBMTR
Steve Spellman, MS	National Marrow Donor Program	CIBMTR
Patty Steinert, PhD, MBA	CIBMTR/MCW	CIBMTR
Mary Horowitz, MD, MS	CIBMTR/MCW	CIBMTR, HCT Center
Navneet Majhail, MD, MS	Cleveland Clinic	CIBMTR, HCT Center
Wael Saber, MD, MS	CIBMTR/MCW	CIBMTR, HCT Center
J. Douglas Rizzo, MD, MS	CIBMTR/MCW	CIBMTR, HCT Center, ASBMT Cmte. on Quality Outcomes
Ellen Denzen, MS	National Marrow Donor Program	CIBMTR, Patient Advocate
Elizabeth Murphy, EdD, RN	National Marrow Donor Program	CIBMTR, Patient Advocate
Mary Senneka	National Marrow Donor Program	CIBMTR, Patient Advocate
Ruta Brazauskas, PhD	CIBMTR/MCW	CIBMTR-Biostatistics
James Bowman, MD	HRSA, Division of Transplantation	Gov't agency
Linda Griffith, MD, PhD	National Institute of Allergy and Infectious Diseases	Gov't agency
William Merritt, PhD	National Institutes of Health	Gov't agency
Christopher Dandoy, MD	Cincinnati Children's Hospital Medical Center	HCT Center
Hugo Fernandez, MD	H. Lee Moffitt Cancer Center and Research Institute	HCT Center
Sergio Giralt, MD	Memorial Sloan-Kettering Cancer Center	HCT Center
Vincent Ho, MD	Dana-Farber Cancer Institute-Peds	HCT Center
Mitchell Horwitz, MD	Duke University Medical Center	HCT Center
Krishna Komanduri, MD	University of Miami	HCT Center
Alan Leahigh	Foundation for the Accreditation of Cellular Therapy	HCT Center
Michael Lill, MD	Cedars-Sinai Medical Center	HCT Center
Paul Martin, MD	Fred Hutchinson Cancer Research Center	HCT Center
Linda Miller, MPA	Foundation for the Accreditation of Cellular Therapy	HCT Center
Thomas Shea, MD	University of North Carolina Hospitals	HCT Center
Daniel Weisdorf, MD	University of Minnesota	HCT Center
Roy Jones, MD, PhD	M.D. Anderson Cancer Center	HCT Center, ASBMT Cmte. on Quality Outcomes
C. Fred LeMaistre, MD	Sarah Cannon BMT Program	HCT Center, ASBMT Cmte. on Quality Outcomes
Tonya Cox	Sarah Cannon BMT Program	HCT Center, QI

Full Name	Organization	Representation
Therese Dodd, MBA, RN, CPHQ	Childrens Hospital of Wisconsin	HCT Center, QI
Leslie Parran, MD, RN, AOCN	University of Minnesota	HCT Center, QI
Colleen Reardon, MBA, CHTC	University of Iowa Hospitals & Clinics	HCT Center, QI
David Vanness, PhD	UW School of Medicine & Public Health	Methodologist
Maureen Beaman	None	Patient Advocate
Barry Schatz	Loyola University Med Center	Patient Advocate
Anthony Bonagura, MD	Optum	Payer Group
Ruth Brentari	Kaiser Permanente	Payer Group
James Coates, MD	Aetna	Payer Group
Stephen Crawford, MD	CIGNA	Payer Group
Stephanie Farnia, MPH	National Marrow Donor Program	Payer Group
Patricia Martin, RN, BSN	WellPoint, Inc.	Payer Group
Ronald Potts, MD	INTERLINK Health Services	Payer Group
Carole Redding Flamm, MD, MPH	Blue Cross Blue Shield of Texas	Payer Group
Jenni Bloomquist, MS	National Marrow Donor Program	Staff
Michael Boo, JD	National Marrow Donor Program	Staff
Janet Brunner, PA-C	CIBMTR/MCW	Staff
Carol Doleysh	CIBMTR/MCW	Staff
Rachel Fonstad, MS	National Marrow Donor Program	Staff
Alicia Gedan Silver, MPP	National Marrow Donor Program	Staff
Lisabet (Lian) Hortensius, MS	National Marrow Donor Program	Staff
Sue Logan, BS, CCRP	National Marrow Donor Program	Staff
Marie Matlack	National Marrow Donor Program	Staff
Lih-Wen Mau, PhD	National Marrow Donor Program	Staff
Amy Ronneberg	National Marrow Donor Program	Staff

Appendix B: Center-Specific Outcomes Forum Organizing Committee

Full Name	Organization
Robert Baitty, MPP	Health Resources and Services Administration (retired)
Maureen Beaman	None
Kristen Bostrom	National Marrow Donor Program
Carol Doleysh	CIBMTR/MCW
Stephanie Farnia, MPH	National Marrow Donor Program
Sergio Giralt, MD	Memorial Sloan-Kettering Cancer Center
Helen Heslop, MD	Baylor College of Medicine Center for Cell and Gene Therapy
Roy Jones, MD, PhD	M.D. Anderson Cancer Center
C. Fred LeMaistre, MD	Sarah Cannon BMT Program
Patricia Martin, RN, BSN	WellPoint, Inc.
Paul Martin, MD	Fred Hutchinson Cancer Research Center
Leslie Parran, MD, RN, AOCN	University of Minnesota
J. Douglas Rizzo, MD, MS	CIBMTR/MCW