characteristic of BOS or (d) parenchymal disease (PD) characteristic of infection (Figure). Spatial information is retained allowing for visualization and quantification of disease within individual lobes. The relative volumes for each classification are determined by normalizing the sum of all voxels within a particular class to the total lung volume. Using HRCT, broncho-alveolar lavage (BAL) and spirometry data, 55 SCT recipients were classified into one of 3 groups: A) Infection, no BOS (n=11); B) BOS, no infection (n=34); and C) BOS + Infection (n=9). BAL were performed within 1 week of the HRCT, in all 55 patients. Mean values (±SE) for functional small airway disease (fSAD), parenchymal (infectious) disease (PD), and normal lung parenchyma were determined for each group (Figure).

**Results:** Distinct imaging profiles were identified for patients with BOS and for patients with an acute infectious pneumonitis. In particular, the %fSAD was significantly greater in patients with BOS when compared to those with infection alone, 38±2% vs 17±4%, p=0.05. There was no difference in the %fSAD for subjects with BOS, whether a concurrent infection was present or not, 35±3% (BOS) vs 38±2% (BOS + Infection), p=0.31. Patients with an acute infectious pneumonitis had significantly higher levels of PD than patients with BOS, 30±4% vs 17±1.5%. In 7 of the 34 (21%) BOS cases, significant increases in fSAD (>30%) were present when radiographic features characteristic for BOS (air trapping, bronchiectasis, septal lines) were either absent or minimal on HRCT. There were no differences in PRM imaging by the type of infection. PRM provides a major advance in our ability to diagnose small airway obstruction that characterizes BOS, even in the presence of an active pulmonary infection. A prospective trial comparing PRM with spirometry and standard HRCT as an early indicator of BOS is planned.

**CRA - DATA MANAGEMENT**

Transplant Center Survey of CIBMTR Internal Assessments
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**Background:** The University of Maryland Blood and Marrow Transplant (BMT) team has firmly established a culture of continuous quality improvement to assure the utmost accuracy of CIBMTR data. In early 2012, Minas and Ruehle reported the significance of auditing 10 commonly used data points. In early 2013, Minas and Ruehle set out to further improve CIBMTR data accuracy by combining their original set of commonly used data points with 19 additional ones.

**Methods:** To explore the internal assessments (IA) audit activities used by other transplant centers to ensure CIBMTR data accuracy, the University of Maryland BMT team developed an anonymous survey consisting of 6 quantitative and 3 qualitative questions. One hundred and thirty seven NMDP (National Marrow Donor Program) and CIBMTR (Center for International Blood and Marrow Transplant Research) affiliated transplant centers (TC) were invited to participate. The survey was administered using Survey Monkey.

**Results:** A total of 86 (62.8%) responses were received. Of these, 57% were from centers that transplanted over 100 patients per year. Most TC (89%) performed some type of IA for their CIBMTR forms. Centers reported that IA were most often conducted by a quality assurance manager (46%). Of the TC that performed IA, 76% reported using FACT (Foundation for the Accreditation of Cellular Therapy) and additional data points as opposed to only FACT data points. Fifty-six percent of TC that conducted IA reported that audits were performed on 10%-30% of patient data on a regular basis, while another 19% reported performing IA for 100% of patient data. Internal assessments were most commonly performed on a quarterly basis (35%).

**Conclusion:** Most TC participate in some sort of IA. The majority of TC perform IA using FACT and additional data points, which likely improves accuracy of the data. Although time is a consideration, completing 100% IA assures the most accurate data. Surveys such as these provide us with knowledge of how all transplant centers assure quality CIBMTR data and prepare for external audits, such as CIBMTR and FACT.


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**Extending the Bridg Model with Hematopoietic Cell Transplant Concepts**


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Organizing data into coherent groups, i.e. data domains, is key to understanding relations between complex subject areas such as information collected around one simple
hematopoietic cell transplant (HCT) event. Multiplying this by the number of transplants that are part of the CIBMTR Outcomes Research Database underlines the need for structures that document this 'data about data' (Metadata). The difficulty is showing how the complete set of data around a transplant event is connected in a way that transcends the collection method, i.e. form. Our aim was to demonstrate that a domain-driven architecture aligns with the forms-based model, and eases the introduction of collecting more data about HCT transplant events. The Biomedical Research Integrated Domain Group (BRIDG) model is publically available. The goal of BRIDG group is to have a common view of the data exchanged for semantic interoperability. The BRIDG model is intended to balance the concerns of the larger health care community, while being specific enough to apply to a particular subject area such as HCT. We extracted all Common Data Elements (CDEs) for all CIBMTR-mandated forms and associated each element to one of three contexts, Recipient, Donor and stem-cell product; most elements were in the Recipient context. Because no element could be described in isolation, instance diagrams were created to describe how one simple concept needed multiple BRIDG entities to be fully described. Some CDEs were described as relationships between entities rather than an attribute of an entity. We extended the generic BRIDG model to contain all identified elements. To this end, we requested the expansion of the BRIDG model to include a 'PerformedSubstanceExtraction' entity at the same level of inheritance as 'PerformedSubstanceAdministration'. While the collection of a stem-cell product could have been described in the context of a 'Product' and a 'SpecimenCollection', the richness of the relationship between a Donor and a Recipient would not have been as obvious. This as well as other enhancements to the BRIDG model were included in BRIDG version 3.2. With this effort, we have documented each data point (CDE) collected on all the CIBMTR-mandated forms and the relationships between them. We intend to use the UML BRIDG model with the added HCT content as the specification for a physical database model. This physical model will help remove barriers that transplant centers experience in electronic transfer of HCT data to the Stem Cell Transplant Outcomes Database by providing a foundation upon which to develop their own in-house data systems, and eventual development of Electronic Medical Record (EMR) integration engines to submit data to the Outcomes Database.

315 BMT Physician-Research Coordinator Relationships: Fostering Reciprocal Communication

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Background: Interpersonal communication is an intangible - and often overlooked - barrier to data management and error reduction. Reporting to the Center for International Blood and Marrow Transplant Research (CIBMTR) and internal databases requires comprehensive data management techniques – including communication processes. Facilitation of interpersonal communication among clinical teams has become increasingly important in healthcare due to potentially adverse outcomes of a communication failure (see Leonard, Graham, & Bonacum, 2004; Marshal, Harrison, & Flanagan, 2009; Propp et. al, 2010) Sutcliffe, Lowton, & Rosenthal, 2004). A poor BMT Physician-research coordinator relationship may result in closed communication, a lack of transparency throughout the clinical team, and insufficient data collection and reporting to CIBMTR. Thus, we recommend actions targeted at removing barriers to reciprocal physician-coordinator communication.

Methods targeting improved communication: (a.) Physician Sign-off: physician-reviewed data verification encourages open discussion and review of essential CIBMTR data prior to transplant; (b.) Rounding: opportunities to attend in-patient rounds with the entire clinical team increases coordinator knowledge base and permits a transparent view of the continuum of care. (c.) Research Nurse Relationships: highly-accessible and responsive nurses serve as key liaisons between coordinators and the clinical team; (d.) Disease In-service & Education: small group continuing education sessions allow teaching moments between physicians and coordinators; (e.) Direct and Real-Time communication: reducing hierarchical barriers allows any team member to directly contact/speak to a physician or use electronic communication to share patient status updates (e.g., relapses, deaths); (f.) Team Engagement Events: social events encourage networking and relationship development (e.g., NMDP Be the Match - Toss the boss, Leukemia & Lymphoma Society, and after work events).

Future: Interpersonal communication is essential to our good clinical practices and embedded in our standard operating procedures. Removing communication barriers and improving relationships has been a critical success factor for our team. Our objective is to continue identifying communication failures while maintaining reciprocal relationships — particularly during times of turnover and transition.

316 Novel Electronic Data Capture Tool Is More Time Efficient for Adverse Event (AE) Capture and Reporting

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Background: AE capture and reporting is one of the most time-consuming activities related to the conduct of hematopoietic stem cell transplant (HSCT) clinical trials, with some trials requiring hundreds of AEs to be captured and summarized for reporting. To improve the AE reporting process, our HSCT Program collaborated with the University of Virginia Biomedical Informatics Division of the Public Health Sciences Department to develop a novel electronic data capture tool. The purpose of this study was to evaluate the tool’s efficiency and identify areas for improvement.

Methods: The electronic tool was designed to be quick, simple to use, and easy to deploy. Microsoft Excel array formulas were used, allowing a calculation to be carried out...