**Using HL7-FHIR to Automate Mandatory Reporting of Bone Marrow Transplant Data Decreases Staff Effort and Improves Data Quality**

C. Thomas, R. Panchal, J. Konecny, T. Casali, M. Buckley, E. Klein

*Memorial Sloan Kettering Cancer Center*

## 1. Background
Memorial Sloan Kettering is required to submit outcomes data on every transplant performed to the Center for International Blood and Marrow Transplant Research (CIBMTR). We have developed an application, BMTVerse, to electronically send data from our electronic health record (EHR) to CIBMTR directly using Health Level 7-Fast Health Interoperability Resources (HL7-FHIR) technology. With this automation, we aimed to decrease the time spent on manual data abstraction from our EHR and manual data entry into CIBMTR and thus reduce data entry errors with this Source-to-Target approach: meet the data where it is.

## 2. Goals
- Eliminate dependency on data managed in excel spreadsheets
- Develop a user-friendly application to extract and blend data from internal databases and send it electronically to CIBMTR
- Reduce manual data entry burden
- Time savings
- Improve data quality

## 3. Solutions and Methods
We partnered with CIBMTR on their Data Transformation Initiative (DTI). To facilitate that, we developed BMTVerse, our home-grown application that leverages data from multiple internal databases and presents the cohort of patients, their demographics, and labs to be submitted to CIBMTR. DMs (Data Managers) can now send the patient demographics and labs to CIBMTR with a simple click. The data automation was done in 3 phases:
• Phase 1 (Dec 2021) demographics data automation
• Phase 2 (March 2022) pre-transplant lab automation
• Phase 3 (Nov 2022) post-transplant lab automation

## 4. Outcomes:
DMs (Data Managers) spend on average 16.5 hours per patient on data entry on CIBMTR form completion per year. We have automated 7/27 (26 percent) demographic fields and 290/5,614 lab data fields (5.17 percent) via BMTVerse. Compared to manual methods, BMTVerse saves between three and twenty minutes for labs (depending on disease and form type) and five minutes for demographic data per patient (Table).

| Data set | Total Demographics fields | # of fields **enabled** for automation (by CIBMTR) | # of fields **added** to automation | Total no: of patients submitted | Time saved (hours) |
|---|---|---|---|---|---|
| Demographics | 27 | 11 | 7 | 634 | 52.8 |
| Labs (across various disease types) | 5614 | 290 | 287 | 423 | 47.2 |

75 percent of our users preferred data automation via BMTverse compared to manual data entry

**5. Lessons Learned and Future Directions:**

Tools like BMTVerse, with the ability to pull and blend data from the various internal data source decreases the time burden associated with manual data extraction and increases accuracy. The percentage of data errors in the next CIBMTR audit will be used to measure the improvement in data quality. Data automation has already saved time and will continue to reduce this administrative data reporting burden tremendously as we acquire and automate more data sets to CIBMTR.

**Figure**

Counts/frequency: Yes (6, 75.0%), No (2, 25.0%), No preference (0, 0.0%)