Automation of Stem Cell Transplant Outcomes Reporting Leads to Dramatic Reduction of Errors Reported to Real-World Data Registry

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Abstract
Real-world data on outcomes after stem cell transplant are aggregated in the international CIBMTR registry. The process of determining engraftment, a key outcome after transplant, is manual, tedious, error-prone. In this talk, we present an application we built and deployed at our center that virtually eliminated errors in engraftment dates reported to the CIBMTR.

Proposal
Stem cell transplantation is a life-saving therapy for various malignant and non-malignant diseases. To aggregate real-world data on stem cell transplant patients, all cancer centers in the U.S. are required by law to report outcomes such as the time from transplant to the emergence of neutrophils and platelets, known as "engraftment," to the Center for International Blood and Marrow Transplant Research (CIBMTR).

Traditionally, engraftment data is curated by data managers who manually look up information in medical records and complete web-based forms. This tedious manual process requires integration of multiple data sources and, at a top-tier pediatric cancer center, was found to have error rates as high as 28%.

To mitigate this problem, we developed an application that calculates engraftment dates automatically. We used the AMIA Usability Framework as a guide to create a minimalist and consistent design with informative and useful feedback and error messages. The Engraftment application passed clinical validation, and it is now in day-to-day use by our data managers, having eliminated the manual process. In a post-implementation validation, we found that the rate of incorrect engraftment dates reported to the CIBMTR had decreased to zero.

In this Systems Demonstration presentation, we will outline the clinical validation, production engineering, and operationalization of the Engraftment application. We will then demonstrate features built into the application that optimize usability and user experience. Finally, we will discuss how the application could be implemented at other cancer centers.