Memorial Sloan Kettering Cancer Center

Accelerating Bone Marrow Transplant Unrelated Donor Searches and Ensuring Data Quality: Development of a Cutting-Edge Tool for Seamless Data Transmission to National Marrow Donor Program

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Background

Every 3-4 minutes, someone in the U.S. is diagnosed with a blood cancer. At Memorial Sloan Kettering Cancer Center (MSK), approximately 70% of our hematology patients require a blood or marrow transplant donor. In partnership with the National Marrow Donor Program (NMDP), MSK has launched the American Symphony Campaign in November 2023 encouraging the population at large, especially those of diverse communities, to become a registry member. NMDP connects the patients in need to transplant with these unrelated donors through their national registry, by collecting the patients' data to match with a registered donor. When a patient is first referred for a preliminary search, MSK's unrelated donor program coordinators must manually enter some patient demographics as well as their human leukocyte antigen (HLA) typing results in the NMDP search application (MatchSource) to initiate the search. Any mistake in manually entering the patient's HLA typing could completely change the patient's NMDP search results. This information was entered manually into NMDP's MatchSource system by MSK's unrelated donor program coordinators until June 2023. Since then, the MSK-developed tool, NMDP Patient Export Tool, leverages electronic data transfer to replace this manual and error-prone task with a faster and more accurate step to identify a matching life-saving donor.

Goals

1. Improve data quality and accuracy: Eliminate manual data entry to reduce translation errors while allowing users to verify the data before initiating the data transfer.
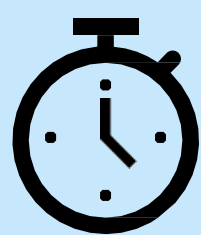
2. Enhance Efficiency and Timeliness: Develop a technology solution to reduce the time spent on data entry into the NMDP's MatchSource system.

Disclaimer: All patients in the screenshot above are fake test patients

23 minutes per patient — Prior to automation (Manual data entry)

5 minutes per patient — With initial launch of NMDP PET (demographics)

Less than 1 minute per patient — With the addition of HLA labs to NMDP PET

Time it takes to enter data for a day 1 prelim search in Match Source

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Solutions and Methods

The NMDP Patient Export Tool (PET) application was built to connect MSK's electronic health record (EHR) with NMDP's database, MatchSource®, by leveraging NMDP's Patient Import Application Programming Interface (APIs) and using HL7 FHIR standards for seamless data transfers. User interviews of MSK donor program coordinators were conducted and enabled NMDP field mapping to the EHR source. A core principle of our approach was to prioritize real-time data acquisition, aligning closely with the overarching goal of expediting unrelated donor searches.

NMDP PET's interface provides coordinators with an intuitive user experience to interact with the patient data with full control and transparency over the submission process. To measure the time efficiency gain and user satisfaction, 8 coordinators participated in a survey issued 1-month post-implementation.

Outcomes

The implementation of automated patient demographics, labs, and HLA has resulted in a remarkable reduction in the day 1 preliminary data entry time. The manual data entry which took 23 minutes per patient now takes less than a minute. That is a 95% reduction in time savings per patient.
The result of our survey shows that around 88% of our users reported that they are very satisfied with the electronic data transfer process and 100% of our users reported that they are confident with the data accuracy.

Lessons learned / Future directions

• Transferring data from the EHR to NMDP requires a thorough understanding of source data intricacies, FHIR compliance, and LOINC code integration for lab data. To achieve a successful integration, a comprehensive mapping and review process is essential to ensure data accuracy.

• In the next phase we plan to integrate patient updates and explore the tool's utility for other transplant centers.