

1. Department of Pathology and Laboratory Medicine, KK Women's & Children's Hospital, Singapore

Introduction

Blood **Bank's** work processes relies heavily on the use of accurate and up-to-date transfusion records. Manual creation and updating of physical record cards (Picture 1) is laborious and time consuming. All transfusion record cards were previously stored in a mechanical filing system, the Hanel Rotomat (Picture 2). Transcription error or breakdown of Rotomat system may compromise patient safety and result in loss of vital transfusion information (Figure 1A and 1B) when preparing for blood and blood product transfusions. Recognizing the need for change, KKH Blood Bank embarked on a project



in search of an electronic solution to replace hand-written patient transfusion records.



Functions of The Cards

▲ Figure 1A: Previous Blood Bank work processes relied on the use of physical transfusion cards (in the red box). These cards were used to record essential transfusion information as listed in ◀ Figure 1(B).





Figure 2. New Blood Bank work processes including enhancement made to LIS system to incorporate essential transfusion information needed for future reference and Microsoft Access program to extract and store backup data for downtime process.

- Identifying patients who have undergone <u>haematopoietic</u> stem cell transplants
- Indicating special transfusion requirements
- Writing results for compatibility testing, and the date/time of blood issue
- Identifying patients under <u>NeOXM</u> protocol
- Identifying patient with alloantibody
- Identifying patient with ABO subgroup
- Identifying patient with Autologous blood donation
- Identifying patient with <u>RhoGam</u> (IVIG) infusion
- Identifying patient who had been transfused with a recalled blood product
- Identifying patient with transfusion reaction to blood product
- For laboratory billing of blood products
- For emergency use during downtime



Picture 1. Patient
Transfusion Record
Cards

Picture 2. Hanel ► Rotomat storage carousel

Method

A working party comprising of Blood Bank staff, Cerner LIS representatives, laboratory IT personnel and colleagues from the **hospital's** Quality, Safety & Risk Management (QSRM) department was formed in July 2018 to brainstorm on a new electronic work process. Enterprise Risk Management (ERM) framework was conducted to identify and mitigate potential risks in the new work processes. Staff were trained on the new workflow and competency assessment was conducted. A separate Access program was implemented to ensure patient records can still be retrieved in the event of LIS downtime. Data was collected 10 days before and after implementation of new work processes. Data reviewed included an evaluation of resource management and processing time spent on retrieval/storage of record cards.



Comparison of Average Time Spent on Manual versus Electronic Retrieval of Patients' Transfusion Records



Figure 3. Average Time Spent on Retrieval of Patient Transfusion Records (Before and After Implementation)

Amount Saved per Annum
S\$4,878.94

Results

All work processes were moved to the electronic platform from December 2018 (Figure 2). A total of 1365 cases were reviewed. These cases were categorized into 2 cohorts: 10 days before implementation (Cohort 1) n=783 and 10 days after implementation (Cohort 2) n=582. The median time spent on routine pre-analytical specimen processing per case for Cohort 1 was 125.29 seconds. This was significantly reduced to 40.13 seconds in Cohort 2 when the retrieval of physical transfusion record cards was eliminated. (Figure 3). The time spent to manually file back a card was also saved (41.01 seconds per card). Manpower time savings of 589 hours and the elimination of Hanel Rotomat resulted in total annual savings of S\$46,710.53 (Table 1).

Manpower cost on retrieval/ filing of cards	S\$41,726.59
Purchase of Transfusion Record Cards	S\$105
Total Annual Savings	S\$46, 710.53
Iotal Annual Savings	5\$46, /10.53

Table 1. Cost Savings from Implementation of Electronic Archiving of Transfusion Records

Conclusion

The newly improved LIS interface has transformed the work pattern within the Blood Bank and has been well-received by staff. Change in work processes promote occupational health and safety for staff as the lifting of heavy storage trays can be strenuous. The elimination of handwritten documentation, combined with safeguard features in LIS, reduces the possibility of serious human error when preparing blood and blood products for transfusion and contributes significantly towards improved patient safety.

We would like to acknowledge and thank our Blood Bank colleagues, IT team from DPLM laboratory and Cerner, colleagues from QSRM department and DPLM Cecilia Wong for their assistance throughout the project.