

White Paper

TOMEs: Improving blood center operations, one clipboard at a time

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Summary

The blood processing laboratory at a children's hospital uses sterile welding to create pediatric aliquots of various blood components. Prior to the implementation of TOMEs software, the laboratory was recording aliquot data using a combination of software and paper records on clipboards. This white paper details the experience of the laboratory with automating the data capture of aliquot activities using TOMEs.

Benefits of software in blood processing

In the 21st century, electronics and automation have made their way into almost every aspect of life. Blood banking and transfusion medicine are no exception, as computerized information systems have been implemented to better handle blood product manufacturing and documentation.¹ More recently, these computerized information systems have evolved to facilitate bidirectional communication.² In a blood center setting, bidirectional communication allows for data transfer between multiple devices in the lab (e.g., barcode scanners, scales, welders, and centrifuges) and information management systems, such as blood establishment computer software (BECS) and electronic medical records (EMRs).

In addition to allowing for bidirectional communication, the use of software in blood processing improves accuracy and traceability. Automated data capture significantly reduces the potential for errors that can occur with manual data entry. Furthermore, the use of software in blood processing allows for centralized data storage and real-time review and reporting.

TOMEs (Terumo Operational Medical Equipment Software) is a dedicated software system that communicates with different Terumo Blood and Cell Technologies devices. The software is installed on an embedded computer that can be connected to the blood center's network. This case study details the experience of one blood center with TOMEs and how the software was used to improve operations.

Experience of one hospital-based blood center with TOMEs

This report details the experience of a blood center in a pediatric hospital in the southwestern U.S. The hospital is one of the largest free-standing pediatric medical centers in the country.³ With 430 hospital beds, the facility provides comprehensive care to infants, children, teens, and young adults up to age 21.³ The hospital blood bank transfuses more than 11,000 units of blood to approximately 1,300 patients each year. Until recently, the blood bank relied on a combination of software applications (via the Trucise® Data Management System) and paper records to track materials and processes at different workstations in the lab.

Since 2016, the hospital's blood processing lab had been leveraging the Trucise communication module with the TSCD®-II Sterile Tubing Welder to keep track of sterile welding information used to produce pediatric aliquots of various blood components. The lab had four processes outlined in Trucise (see Table 1) to support their aliquoting activities. With each process, the lab was able to capture barcode scans, keep track of unit numbers, record lot numbers, and monitor expiration dates for aliquot supplies. Trucise was also used to record weld times and verifications. As a pediatric institution, one of the main aliquoting activities performed at this blood center is the transfer of platelets into syringes or small bags for transfusion to infants. Once aliquoted, these platelets must be transfused within four hours; therefore, recording accurate weld times is essential.⁴



In addition to using Trucise to track sterile welding activities, the lab was manually tracking additional data about the aliquots — such as unit and lot numbers of supplies used — using paper on clipboards. Records were reviewed manually by the lab supervisor or designated staff, who would walk around the lab to each clipboard and sign off on them every week. These paper records were then stored in physical files, requiring a considerable amount of storage space. Walking through the lab to review records in this manner is tedious, in addition to being error-prone, as manual records may contain misprints or illegible data entries.^{5,6}

Transition to TOMEs

In April 2022, laboratory staff at this institution made the transition from using a combination of software and paper records to solely using TOMEs software to capture data throughout the lab. Initially, processes were created in TOMEs to replace the processes that had been outlined in Trucise for sterile welding activities. Upon implementing TOMEs for sterile welding activities, the value of the software became apparent. Additional processes were created in TOMEs to replace manual tracking of materials (unit numbers, lot numbers, supplies used, etc.) not associated with a sterile connection device (see Table 1). The lab staff eventually created 12 processes in TOMEs to automate the data capture of nearly all of their lab procedures. Implementation of TOMEs also allowed for the replacement of two clipboards with paper records that had been used at different lab workstations to collect data. This provided several benefits to the lab staff, such as a reduction in time spent manually recording data and a decrease in the potential for recording errors. Additionally, automated data

capture made the records easier to review. The lab manager could access all records from one computer instead of walking to each workstation in the lab.

Table 1. Example list of processes transitioned from Trucise and clipboards upon implementation of TOMEs

Processes captured by Trucise prior to April 2022	Processes captured by clipboards prior to April 2022
Syringe – sterile <ul style="list-style-type: none"> Operator ID Unit number Product code Expiration date 60 mL syringe Clamp Prepare weld Weld 	Syringe – spike <ul style="list-style-type: none"> Operator ID Unit number Product code Expiration date 60 mL syringe Clamp
Platelet aliquot <ul style="list-style-type: none"> Operator ID Unit number Product code Expiration date Lot number (platelet bag) Platelet expiration date Clamp Prepare weld Weld 	Recon <ul style="list-style-type: none"> Operator ID Unit number/1 Product code/1 Expiration date/1 Unit number/2 Product code/2 Expiration date/2 300 mL transfer bag
Red blood cell/fresh frozen plasma aliquot <ul style="list-style-type: none"> Operator ID Unit number Product code Expiration date 300 mL transfer bag Clamp Prepare weld Weld 	Pool cryoprecipitate <ul style="list-style-type: none"> Operator ID Number pooled Unit number/1 Unit number/2 60 mL syringe (for pooling of 2 to 3 units) OR 300 mL transfer bag (for pooling of 4 to 10 units)
Pedi pack <ul style="list-style-type: none"> Operator ID Unit number Product code Expiration date Lot number (pedi pack) Clamp Prepare weld Weld 	  AUTOMATED DATA CAPTURE WITH IMPLEMENTATION OF TOMEs

Conclusion

The blood processing laboratory at this pediatric hospital initially saw the value of TOMEs in replacing Trucise to automate data capture of their sterile welding activities. The laboratory staff extended the value of the TOMEs software by replacing manual record-keeping of several processes outside of sterile welding activities. This simplified the record-keeping for lab staff and also the record review process for the lab manager. The implementation of TOMEs at this site supported workflow and compliance, but more importantly improved the laboratory staff's day-to-day jobs.

References

- ¹ World Health Organization. *A practical guide to the implementation of a computerized information management system for blood transfusion services*. Geneva: World Health Organization; 2019.
- ² Sharma G, Parwani AV, Raval JS, Triulzi DJ, Benjamin RJ, Pantanowitz L. Contemporary issues in transfusion medicine informatics. *J Pathol Inform*. 2011;2:3.
- ³ Page L. 30 largest children's hospitals in the United States. *Becker's Hospital Review*. August 29, 2011. Accessed June 3, 2022. <https://www.beckershospitalreview.com/lists-and-statistics/30-largest-childrens-hospitals-in-the-united-states.html>.
- ⁴ Association for the Advancement of Blood and Biotherapies. Circular of information for the use of human blood and blood components. December 2021. Accessed July 6, 2022. https://www.aabb.org/docs/default-source/default-document-library/resources/circular-of-information-watermark.pdf?sfvrsn=7f5d28ab_5.
- ⁵ Slyngstad L, Helgheim BI. How do different health record systems affect home health care? A cross-sectional study of electronic versus manual documentation systems. *Int J Gen Med*. 2022;1945-1956.
- ⁶ Tsai J, Bond G. A comparison of electronic records to paper records in mental health centers. *Int J Qual Health Care*. 2008;20(2):136-143.



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