Utilizing Automation as a Tool to Standardize Processes in a Hospital System

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Objectives
- Implementing automation in a hospital system
- Making automation work for you
- Discuss the new antigen labeling standard
- Case study

Hospital Transfusion and Donor Service
Mercy Health (HMHP)
- St. Elizabeth Mercy Health-Centralized Transfusion and Donor Service serves 3 hospitals: St. Elizabeth Youngstown (SEY), St. Joseph Warren (SJW), and St. Elizabeth Boardman (SEB), Ohio. We have one manager and the same SOPs at all hospitals.
- New employee training is done at SEY for all hospitals.
- Same computer system and one data base.
- All labs are AABB, CAP accredited and FDA registered.
- We also act as the Transfusion Service for a local children’s hospital and a large surgical hospital.
- We operate a Level 1 Trauma Center with a large heart program, orthopedic surgical program, a large outreach system, and a OB/GYN department including a neo-natal intensive care unit.
- We are located 70 miles from our supplier and have maintained a donor program for many years in order to better serve our communities.
History with Capture or How to Make the Staff Happy

- In 1996 we evaluated manual Capture and Gel against the then used LISS methodology.
- LISS failed sensitivity levels. PEG was then added to the evaluation.
- Evaluation studies showed comparable results between Capture, GEL, and PEG protocols.
- LISS was eliminated from our protocols except as investigational tool.
- The STAFF chose manual Capture as our routine procedure.
- We set up two manual workstations and became very proficient including making monolayers for panel studies.

Automation and Standardization

- In 2005, we implemented the Galileo successfully. The staff was delighted!
- We operated the Galileo 2 shifts a day but remained on manual Capture procedures for the midnight shift. Manual Capture was also introduced at our other two institutions.
- In 2009, the ECHO was added. The ECHO was used for STATS and replaced manual procedures on the midnight shift.
- In 2012, ECHOs were implemented at our other two hospitals.
- The ECHOs were very well received at our sister hospitals because of the limited staffing at those hospitals.
- A NEO will replace our beloved Galileo in the current year.
Daily Operations

- All units are received at St. Elizabeth Youngstown.
- Retypes are performed on the Galileo/Echo before units are distributed to our sister hospitals.
- Initial panels are performed at the originating hospital. Additional workups are sent to St. Elizabeth Youngstown for resolution when necessary.
- Daily, panel sheets are faxed for review and to aid in additional antibody identification when necessary.
- Antigen negative units are usually supplied by SEY “Big House”.
- Parallel specimens are sent to each hospital at least twice a year.

Automation and the Donor Program

- Donor Types and Screens are performed on the Galileo/Echo.
- Regular donors are fully antigen typed to facilitate easy recall.
- We have several hematology/oncology patients who have developed their own dedicated directed donor program.
- Automation is invaluable when processing donors in the midst of our hospital patients.

Sickle Cell Policy

- In 2007, we became a children’s hospital overnight when the large city hospital closed its doors. Among the new services that we took on was a sickle cell program.
- We developed a policy in conjunction with our hematology/oncology physicians.
  1. Known sickle cell patients are fully phenotyped for RH, K, Kidd, S, and FY antigens before transfusion therapy is initiated.
  2. If the patient has a negative antibody screen, they receive units negative for E, C, and Kell.
  3. Once the antibody/ies are identified, fully phenotypically matched units are provided. If unable to provide a fully matched units, the physician is notified.
Sickle Cell Policy

- An inventory of 80-100 Group O units are maintained.
- The Group O units are routinely typed for Cc, E, and Kell antigens on the Immucor Galileo. Testing can also be performed on the Echos.
- Antigen negative units are labeled using tie tags.
- When additional antigen testing is required, manual testing is performed.
- This protocol allows us to rapidly supply antigen negative units especially for our sickle cell patients.

Case Study

- 16 yr. old female was major trauma following a MVA on the Ohio turnpike. We had no history except for the medical alert bracelet stating that she was a sickle cell patient. She was resident of Tennessee.
- Because of our pre-tested group O inventory, we were able to provide the first ten red cell units in response to our massive transfusion policy that were C, E, and Kell negative.

Labeling: New standard 29th. edition

Standard 5.8.4
Red Cell Antigens other than ABO and RhD
“Units may be labelled as antigen negative, without testing the current donation, if units from two previous separate donations were tested by the collection facility and found to be concordant.”

AABB Standards for Blood Banks and Transfusion Services, 29th edition
ANTIGEN TYPING

- **Sero logical:** Hemagglutination is the most common method used to determine phenotype in which the patient/donor cells are tested against commercial antisera.
  - Manual:
  - Automation:
- **Molecular:** DNA based tests to detect the genes that encode RBC antigens.

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- If a donation is tested by a molecular method LDT (lab developed test), RUO (research use only) or licensed
  - Confirm serologically all antigen negative status as possible
  - Molecular x1
  - Serologic x 2
  - Confirmed
- Label as antigen negative. Some suppliers may include the antigens as part of the ISBT label in the lower right hand quadrant.

Summary

Automation and standardization are keys to success

1. Patient Service
2. Staff satisfaction and allows for mobility within the system
3. Increased productivity
4. Saves money for both the hospital and the patient
5. Physician satisfaction
References

  How do we use molecular red blood cell antigen typing to supplement pretransfusion testing.

- Jayanna Slayten, MS, MT(ASCP)SBB Indiana Blood Center IRL Manager and SBB Education Coor. "Strategies for Labeling Of Rare Red Cells"

- Jared Fry, MT(ASCP)SBB, Monica Kalvelage, MT(ASCP)MB, SBB. "Labeling Blood Products Based on Historical Antigen Typing Results"