

2009

Abstract Journal



SOUTH CENTRAL
Association of Blood Banks

ORAL PRESENTATIONS

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3	8:25 AM	Evaluation of CD34+ Cell Viability Over Time in Apheresis Products	Transplant
9	8:35 AM	Evaluating the CardianCT Atreus to Simplify Disaster Recovery	Component
6	8:45 AM	ABO Discrepancy Due to a Rare B(A) Phenotype in an Asian Individual	RBC
5	8:55 AM	How Are Donor Centers Meeting the AABB Standard 8.2: Monitoring Blood Utilization?	Quality
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POSTER PRESENTATIONS

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Oral Abstract Key  (denotes Oral Presentations)

Abstract 1



APHERESIS

The Impact of Mobile Apheresis Platelet Drives

BACKGROUND: After Hurricane Katrina in August of 2005 our blood bank's apheresis platelet usage increased by 179%. This demand for more platelets stemmed from large numbers of medical evacuees from New Orleans as well as increased population in the Baton Rouge area. When faced with this huge dilemma we decided to implement mobile apheresis platelet drives.

METHODS: We decided to conduct our first apheresis platelet drive at our largest corporate group, Dow Chemical. They had many platelet donors who came to our center to donate, but because of their work schedule could not come on a regular basis. With great enthusiasm from the donors and the blood drive chairman, we agreed to conduct platelet drives at their location every two weeks. We made a schedule with time slots available every two hours using two instruments. This schedule was emailed to the interested donors and they were able to choose their time slot. We were able to use the historical data from their last three platelet donations to customize their current donation. After the first year we changed our instrumentation to the Trima Accel collection system.

RESULTS: By changing to the Trima Accel we were able to create more time slots due to shortened collection times, while collecting double platelet products from some donors. Using the Trima Accel we collected 299 apheresis platelets on mobile drives from October 2006 – September 2007. This compared to 180 apheresis platelets on mobile drives from October 2005 – September 2006 using our old instrumentation. This represents an increase of productivity by 66%. With the collection versatility of the Trima Accel we were also able to collect 79 concurrent products (37 red blood cells and 42 plasma products) and about 30% were able to donate double platelet products.

CONCLUSION: The results of our mobile program show that apheresis platelet drives can be very successful when using the right donor group and the Trima Accel instrumentation. Apheresis platelet drives have made a huge impact on our platelet inventory. Upgrading our instrumentation to the Trima Accel increased our platelet collections on mobiles by 66%. The flexibility of the Trima Accel also allowed us to maximize the collection from each donor by collecting multiple products. We are currently looking to expand our platelet drives to other donor groups.

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Abstract 2

OTHER

Evaluation of the Galileo Echo™ Automated Blood Bank Instrument for Pretransfusion Testing

BACKGROUND: Willis-Knighton Health System (WKHS) is a 900+ bed healthcare system consisting of Willis-Knighton Medical Center (WKMC) and 3 satellite facilities; Willis-Knighton Pierremont Health Center (WKP), Willis-Knighton South (WKS) and Willis-Knighton Bossier Health Center (WKB). Prior to implementation of the Galileo Echo™ (Immucor, Inc. Norcross, GA), Gel Test™ method (Ortho-Clinical Diagnostics, Raritan, NJ) was utilized for antibody screens at all three satellite facilities while antibody screens were done at WKMC using tube LISS method (Panoscreen®, Immucor, Inc. Norcross, GA). Tube hemagglutination was used at all 4 sites for ABO/Rh testing. Weak D testing was performed at all 4 sites using tube method. At the satellite facilities, all positive screens are referred to a local reference lab for antibody identification (ID). At WKMC and at the local reference lab, antibody ID is performed using tube LISS method (Panocell®, Immucor, Inc. Norcross, GA).

METHODS: Using Galileo Echo, a total of 305 ABO/Rh samples were tested in parallel with hemagglutination by tube method, 40 antibody screens were tested in parallel with tube LISS method at WKMC (20 positive and 20 negative), 162 antibody screens were tested in parallel with Gel Test method at the satellite facilities (60 positive and 102 negative) and a total of 157 Rh negative samples were weak D tested in parallel with tube method. Also, 94 antibody IDs were tested in parallel with tube LISS method.

RESULTS: ABO/Rh sample testing yielded a concordance of 99.0% (302/305). Three samples resulted as NTD (No Type Determined) on the Galileo Echo. There was 100% concordance (157/157) between weak D testing done on the Galileo Echo and using tube method. There was 95.0% concordance (38/40) among the antibody screens tested in parallel with tube LISS method at WKMC. One sample resulted in a positive antibody screen on the Galileo Echo, but negative using tube LISS method. This patient had a history of anti-E,-Fya. A second sample was positive using tube LISS method but the antibody screen on the Galileo Echo was negative. Anti-M was identified from this sample. The antibody screens tested in parallel with Gel method at the satellite facilities yielded a concordance of 98.8% (160/162). One sample was negative in Gel and positive on the Galileo Echo. This sample was referred to the reference lab and was found to be negative using tube LISS method, but anti-E was identified using the Galileo Echo.

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RESULTS: (continued)

One sample was negative using Galileo Echo and positive using Gel. This sample was referred to the reference lab and a cold autoantibody was detected. Of the 94 antibody IDs tested thus far, there has been 90.4% concordance (85/94). One example of anti-Jka was identified using Galileo Echo but was undetected using tube LISS method. One previously mentioned example of anti-E was identified using Galileo Echo but was undetected using tube and Gel methods. Two samples reacted with all cells tested on the Galileo Echo and were referred to the reference lab. An anti-S was identified from one and the other showed no reactivity in tube LISS method at the reference lab. Three samples were positive using Galileo Echo, but a clear pattern of reactivity could not be identified. Anti-M was identified for all three samples by the reference lab. An anti-K was identified at the reference lab from a sample that reacted with two of three K positive cells on the Galileo Echo. The K positive cell that did not react on the Echo was heterozygous for K. One sample resulted in an anti-E and a cold autoantibody when referred to the reference lab. Using the Galileo Echo, this sample showed reactivity with all E positive cells and with three E negative cells.

CONCLUSION: The Galileo Echo automated blood bank instrument has performed consistently and is a welcome addition to our lab for pretransfusion testing. We are currently still evaluating and validating the Galileo Echo for antibody ID, but the data collected so far is promising.

Author(s): Jimmy Lowery, A. Johnson, P. Boullion, J. Murphy, L. Savage, H. Bonner – Willis-Knighton Health System.

Abstract 3



TRANSPLANT

Evaluation of CD34+ Cell Viability Over Time In Apheresis Products

BACKGROUND: Hematopoietic Progenitor Cell (HPC) products for transplant are tested to determine the dose of CD34+ cells for the recipient and to determine the percent viability of CD34+ cells. Storage conditions of the product and the time elapsed between collection and testing can affect cell viability. Samples stored at both room temperature (RT) and refrigerated (2-6C) from 5 HPC products were tested over four days to assess changes in cell viability over time. CD34+ cell enumeration with viability was performed using CD45-FITC/CD34-PE and ViaProbe Cell viability solution. The initial testing (Day 0) for all products was performed within 7 hours of apheresis collection. The sample was then split into 2 aliquots for storage at RT and 2-6C for subsequent testing. CD34+ counts with viability were performed for 3 additional days post collection (Day 1, 2, & 3.)

RESULTS: From Day 0 showed initial CD34+ cell viability of 98.1 – 100%, with CD45+ viability of 96.9 – 99.7%. CD34+ viability for Day 1 RT samples was 57.3 – 96.4%. CD45+ viability for Day 1 RT samples was 52.2 – 92.6%. Day 1 refrigerated samples maintained CD34+ viability greater than 97.9% and CD45+ viability greater than 94%. Day 2 CD34+ viability for RT samples was 18.6 – 70.9%,

while refrigerated samples were over 94%. Day 3 CD34+ viability for RT samples were all less than 36% (CD45+ viability of 6.0 – 57.1%), while the refrigerated sample CD34+ viability was 79.0 – 99.3% (CD45+ viability of 71.9-96.9.)

CONCLUSION: Refrigeration of samples demonstrated greatly improved stability of CD34+ and CD45+ cell viability during extended storage compared to samples maintained at room temperature. There was a significant decrease in overall cell viability and % viable CD34+ cells for RT samples after just one day of storage. The majority of HPC products are tested within one day of collection, but this data should be considered when analyzing products delayed during transport or coming from international collection sites for testing.

Author(s): Melissa Marlowe, MT(ASCP) CHS, Blood Systems Laboratories, N. Marcus, A. Hoffman, H. Redman, C. Wolters, R. Medis, R.O. Endres – Blood Systems Laboratories.

Abstract 5



QUALITY

How Are Donor Centers Meeting the AABB Standard 8.2: Monitoring Blood Utilization?

BACKGROUND: Some donor centers (DCs) provide contracted crossmatch services (CS) to clients that do not provide crossmatching and blood component preparation on site. An AABB accredited DC must meet all of the AABB Standards for Transfusion Services including 8.2. The goal of this study is to determine how many DCs are currently providing these services, how many have discontinued and why and how many are currently meeting AABB Standards.

METHODS: A survey of 25 questions on provision of CS and blood utilization practices was distributed to independent donor centers from across the nation that consisted of 78 members. A partial blinded evaluation and analysis was performed.

RESULTS: Of the members surveyed 53 (68%) of the 78 members responded. Of these, 34(64%) provided CS currently or previously. Seven (13%) of the 34 discontinued CS with the following reasons: unwilling or unable to meet AABB Standards (five), lack of need (four), staffing (one) and clients unwilling to meet DCs quality standards (one).

Of the 27 (51%) DCs that provide CS, 12 (44%) monitor blood utilization (MBU) data. Of the later group, nine (75%) have 0.5-1 full-time equivalents (FTEs), one has two-three FTEs and two have no FTEs devoted to collection of data. Methods for collection varies: seven (58%) use request forms and data collected by the client, one (8%) use only request forms, three (25%) collect data from the client only, and one (8%) used all of the above plus patient chart review.

Of those that MBU, eight (67%) review the data quarterly, one (8%) annually, one (8%) monthly, and two (17%) do not review. Five (42%) DCs provide the information to the client only, four (33%)

perform a peer review and provide the information to the client, and three (25%) do nothing. One of the facilities also requires proof of an internal peer review by the client.

Of the 27 (51%) that provide CS five are transfusion committee members, nine perform policy reviews, four provide data, eight provide education and training, and 16 don't participate. Thirteen (48%) DCs indicate their current policies, processes, and procedures comply with AABB Standard 8.2, four (15%) do not comply, and 10 (37%) skipped the question. Only eight (30%) of the DCs indicated that they have been audited by AABB, and two (25%) had nonconformities cited while six (75%) passed with no conformities.

CONCLUSION: This pattern of responses indicates that a dialogue between DCs and AABB Standard's Committee would be beneficial. No uniform interpretation of Standard 8.2 exists and DCs may meet it in different ways. Guidance from the AABB is necessary in order for DCs to continue providing CS and comply with Standards. The Standards needs to be interpreted more realistically so AABB accredited DCs can continue to provide this important service to the community.

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Abstract 6



RBC

ABO Discrepancy Due to a Rare B(A) Phenotype in an Asian Individual

BACKGROUND: Individuals exhibiting the B(A) phenotype carry normal B antigens and small amount of A antigen on their RBCs, with anti-A in the serum. Some monoclonal anti-A reagents are capable of agglutinating B(A) RBCs, which results in a discrepancy between RBC and serum ABO typing. The B(A) phenotype was first detected with the advent of monoclonal ABO reagents. These A antigens are detected by a licensed anti-A reagent that contains a particular murine monoclonal antibody, MH04. The B(A) phenotype is attributable to specific mutations in the B gene that cause the B transferase to synthesize small amounts of A antigen. To date, five B(A) alleles, (ABO*B(A)01, B(A)02, B(A)03, B(A)04 and B(A)05) have been defined by nucleotide sequencing. The B(A)04 and B(A)05 alleles were recently found in Chinese populations. Case Report: A specimen was received for ABO discrepancy workup from XL, a 32 year old Asian female of Chinese origin, an obstetric patient. Serological testing revealed an ABO discrepancy. XL RBCs reacted 3+ with anti-A, 4+ with anti-B and no reactivity with anti-A1 lectin. XL reverse typed as Group B with strong anti-A, no reaction with B cells and no irregular antibody detected. The serum typing made a clear distinction between A subgroup B and B(A). Testing with four different anti-A reagents was performed. XL RBCs reacted 3+ on both gel and tube testing only with Ortho anti-A reagent which is known to contain the murine monoclonal antibody (MH04). The presence of A antigens on the RBCs was confirmed by adsorption and elution methods. These results were

indicative of the B(A) phenotype. The sample was sent to a reference laboratory for further studies and ABO genotyping. DNA analysis was performed using polymerase chain reaction-restriction fragment length polymorphism testing and genomic sequencing. PCR-RFLP testing indicated the presence of a deleted G at nucleotide position 261 in exon 6 which is characteristic of O alleles, and the presence of nt703A and nt1096A which are characteristic of B alleles. Genomic sequencing from exon 6 to exon 7 of the ABO gene confirmed the presence of O allele, specifically ABO*Olv allele, and an ABO*B(A)04 allele. The reference laboratory reported the ABO genotype as ABO*B(A)04/ABO*Olv, ie B(A)O and the predicted phenotype is B(A).

CONCLUSION: Recognition of the B(A) phenotype is usually made with the discriminating monoclonal anti-A reagent in which the B(A) RBCs show reactivity. The B(A) phenotype individual has excessively high levels of B gene specified galactosyl transferase. Testing with anti-A without MH04 clone should resolve the discrepancy. Group B(A) blood survives normally when transfused to group B individuals. These individuals can be considered as Group B. Patients with the B(A) red cell phenotype should receive group B or group O blood. Because of its rarity, the clinical significance of this phenotype remains unknown.

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Abstract 7

Transfusion

Methodologies Utilized for Testing by Transfusion Services in Hospitals in Mississippi

BACKGROUND: In recent years new technologies have been developed to replace conventional tube agglutination tests long used in immunohematology laboratories. The purpose of this study was to determine which of three technologies (conventional tube agglutination, gel tube agglutination, or solid phase) are currently utilized in the transfusion services of hospitals in Mississippi.

METHODS: A researcher developed survey was mailed to all 107 hospitals in the state with a return rate of 70 (65.4%). Hospitals were placed in categories for comparisons based on bed size, with 60% of hospitals having 100 beds or less.

RESULTS: Hospitals of less than 100 beds reported 71.4% used conventional tube (CT) methods and 21.4% used gel tubes (GT) for ABO and Rh testing. None of those in this group reported using solid phase testing (SP). Larger facilities from 101 beds up to 350+ beds reported 46.4% of transfusion services chose CT, 46.4% GT and 7.1% SP as their testing method. For antibody screening testing at the smaller transfusion services 57.1% reported using CT versus GT at 35.7%.

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Larger facilities reported CT used at only 28.5 % of facilities versus GT at 60.7%. SP was used only in larger sites at a rate of 10.7%. Statistically significant differences were found between smaller and larger transfusion services for both ABO and Rh typing (p=.039) and antibody screening tests (p=.033).

CONCLUSIONS: Hospital transfusion services in Mississippi, a predominately rural state, reported that CT testing remains the primary method of choice for routine testing, especially in facilities having less than 101 beds. This study does demonstrate that the number of facilities using GT is rising especially for antibody screening and for testing in larger hospital transfusion services. SP is used in only a small percentage of total facilities.

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Abstract 8



RBC

Anti-rhi (Ce) – The Often Forgotten Specificity

BACKGROUND: Anti-Ce, or rhi, is an antibody against a compound antigen on red cells of people who have both C and e on the same chromosome.

CASE REPORT: The patient was a 34 yr. old female experiencing abdominal pain and bleeding. The patient had no history of antibodies; however, the patient had a history of pregnancy and transfusions. The referring hospital reported a 2+ reaction in SC-1 in gel and with one donor unit. Initial panel results revealed a 1+ anti-C pattern present at 37C; only two of the four C+ cells carried through to AHG.

Due to the weak reactions in LO-ION, a PEG panel was performed. Again, an anti-C pattern was observed. Two additional C- cells also reacted, however. A complete phenotype was then performed on the patient's red cells, and a selected cell panel was tested in PEG to explain the additional reactions. Only two of the six selected cells reacted, and anti-C was excluded on an RZRZ cell (DCE/DCE). The two reactive cells were e+, while the four nonreactive cells were e-.

The patient's cells typed as D+C-E+c+e- (R2R2). A ficin-treated panel revealed that the additional reactivity observed in PEG was due to anti-e. Anti-e was reported, and e- units were cross matched and sent to the hospital for transfusion.

Upon review of the work up, it was determined that the patient also had anti-Ce. This was based on the strength of the reactions with R1R1 (D+C+E-c-e+) cells, which explained the apparent anti-C pattern observed in both LO-ION and PEG, as all C+ cells reacting were also e+.

CONCLUSION: Anti-Ce(rhi) can be clinically significant but might not be recognized when a serum also contains anti-e. This case illustrates the fact that multiple techniques can explain results giving inconsistent patterns of reactivity. A pattern for anti-C was first observed at 37C, which was actually due to anti-Ce, as anti-C was subsequently excluded with an RZRZ cell.

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Abstract 9



COMPONENT

Evaluating the CaridianBCT Atreus to Simplify Disaster Recovery

BACKGROUND: The Blood Center (TBC) in New Orleans, LA, collects and distributes approximately 70,000 units of blood to 47 hospitals across the northern Gulf Coast. During Hurricane Katrina, TBC suffered major damage. Many experienced component laboratory staff members were displaced from their homes and never returned. This left few seasoned staff members to train new employees. It was clear that a whole blood processing system that required minimum training would have made recovery easier. The CaridianBCT Atreus system is a new device that automates the production of whole blood products. Processing sets have leukoreduction filters attached to it. Each Atreus centrifuges, separates, weighs, seals, and documents one unit at a time. Three instruments are grouped into a work cell, which are interfaced to the Atreus System Management software.

METHODS: TBC sent a team of four people to CaridianBCT's Atreus Simulation Lab. The team consisted of two experienced staff members, and two staff members with less than six months of experience. CaridianBCT personnel trained the TBC team. After two hours of training, the team conducted its first simulation run using bovine blood and videotaped it. The team reviewed the video, analyzed the process, and performed time studies.

RESULTS: Training- Manual methods require a minimum training period of two months before a staff member is considered competent. TBC staff members were capable in four hours and expected to be competent within two-weeks. Processing Time- Two techs in two work cells processed 14 units/hour after four hours of training. Those same techs processed 16 units/hour using current manual methods. Based upon time studies by CaridianBCT, that number could be increased to 22 units/hour once the techs were fully competent.

Method	Productivity (# Units/hour/FTE)	Training Time	Staff Status
Current	8	8 weeks	Full Competency
Atreus	7	4 hours	Capable
Atreus	11	2 weeks	Full Competency (projected)

CONCLUSION: During disaster recovery, training of new staff is challenging. The Atreus system will enable new staff to be capable of component production after four hours of training at 87% of current productivity. After two weeks, new staff could exceed current productivity by 37%. Training time could be decreased by 75%.

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Abstract 10

ADMINISTRATIVE

An Innovative Tool to Manage Laboratory Resources

BACKGROUND: Resource management in the laboratory environment presents unique challenges for staff. Meeting the demands of increased workload, whether from planned growth or emergency response, requires advanced planning. Aligning resources to meet operational goals are often experience based and not predefined. Having standardized methods to assure adequate resources placement can improve the efficiency of the Laboratory and facilitate rapid change.

METHODS: A tool was developed utilizing Excel software to provide a standardized method for projecting and planning laboratory growth. The program contains formulas that define the relationship between the following elements:

- 1) desired turn around time of result delivery,
- 2) calculated through put of each piece of equipment,
- 3) staff needs per 8 hour shift, and 3) average distribution of sample volume on a daily basis.

Additional variables included in the analysis are instrument reliability, staff vacation/sick/holiday time and the pacesetting processes in the routine workflow.

RESULTS: Based on an annual projected sample volume, management can easily identify the number of staff and/or equipment required to meet a defined result delivery time. The formula driven method provides a standardized method for projecting equipment and staffing needs for all laboratory departments and has been valuable tool in strategic planning. Staff has demonstrated confident with workload increases and management routinely uses the tool to meet organizational goals. The tool was recently used to facilitate a 38% increase in sample volume within a 6 week period as part of an emergency response event.

CONCLUSION: The use of this tool has removed bias and subjectivity in planned and unplanned growth. A well defined process for growth management has been a valuable assess in regulatory audits and has become a part of the Laboratory's emergency preparedness procedure. The rapidly changing environment of laboratory operations makes it critical to have tools available to predict adequate resources in order to project growth in a standardized manner.

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**Poster Abstracts will be on display
in the Century Ballroom Foyer
throughout the meeting.**



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