Carter BloodCare
SPECIALTY SERVICES

Blood Matters

June/July 2018

Blood Matters is a quarterly news *outlet with important medical information for you, our customers and colleagues, from Carter BloodCare. We hope you will share it with others interested in the work we do together.*

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HOT TOPICS

ABO Incompatible Kidney Transplantation – A Solution to a Growing Need

Lesley Kresie, MD

The number of patients requiring a kidney transplant continues to rise each year and the number of organ donors remains insufficient to meet the need. The growing list of patients waiting for an organ has led transplant programs to look at all possible donor options for their patients, such as living donors, paired donors and, more recently, incompatible donors. The improvements in immunosuppression regimens have created an opportunity to decrease the wait time for patients on the transplant list by offering organs that would have previously been considered incompatible. Major ABO incompatibility (e.g. group A1 donor to group O recipient) still requires intense evaluation and desensitization prior to transplant; however, these transplants have been done successfully with long-term outcome rates similar to ABO compatible pairs, and the numbers will continue to rise.

Use of major ABOi kidneys is generally only performed in the living donor setting and, therefore, will not address the needs of patients on the waitlist for a deceased donor. When a deceased donor's organ becomes available, there is not enough time for a patient to undergo extensive desensitization prior to transplant, so the risk of acute rejection is very high with an ABO incompatible donor. However, not all ABO group A donors are type A1. The qualitative and quantitative differences in antigen expression, between blood group A1 versus non-A1, has allowed transplant programs to consider these organs in the deceased donor setting without the need of extensive pre-transplant desensitization.

All group A and AB deceased donors are now typed for the presence of the A1 antigen. If negative, the non-A1 (or non-A1B) donors are offered to group B patients, as this group has the longest waiting time on the transplant list of any blood group. Several transplant programs have been performing the non-A1 to B transplants for decades with great success. In order to extend this practice to other programs, the Organ Procurement and Transplantation Network updated their policies in December 2014 to allow all transplant programs to transplant non-A1 and non-A1B kidneys to group B patients without requiring a variance. In order for the patient to be listed as eligible, the transplant program must have written informed consent that the patient is willing to accept the non-A1, non-A1B kidney. The program must also establish a written policy regarding acceptable antibody titer threshold in the patient for receiving these organs and must confirm the candidate's eligibility every 90 days (+/- 20 days).

One of the biggest obstacles for transplant programs in implementing this new opportunity has been determining antibody titer threshold and patient eligibility. This process will require close communication with the transfusion service so that all parties understand, and agree on, the methodology, frequency of testing, and titer threshold for a successful transplant. For additional information, please visit: **https://optn.transplant.hrsa.gov/media/2347/mac_guidance_201712.pdf**

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Changes to the 31st Edition of AABB Standards for Blood Banks and Transfusion Services

Laurie J Sutor, MD, MBA

The 31st edition of AABB Standards for Blood Banks and Transfusion Services went into effect on April 1, 2018. There were several changes and additions of note, a few of which are of interest to hospital blood banks. Selected changes are highlighted below. Note that this article does not comprehensively cover the changes to Standards.

5.14.5 There shall be *two determinations of the recipient's ABO group* as specified in Standard 5.14.1. The first determination shall be performed on a current sample, and the second determination by one of the following methods: 1) Testing a second current sample, 2) Comparison with previous records, or 3) Retesting the same sample if patient identification was verified using an electronic identification system or another process validated to reduce the risk of misidentification. In the previous edition of Standards, this requirement only applied to samples used for electronic crossmatch. Now it will apply to all samples used for ABO testing. This change brings AABB in line with other agencies such as College of American Pathologists which already have had similar requirements in place. The gray area will be section 3) – what will qualify as a "process validated to reduce the risk of misidentification?" AABB has indicated that a dedicated blood bank ID bracelet system may qualify if the facility has done the appropriate validation and training and is tracking errors in specimen collection and patient identification.

5.15.1 Recipients shall receive ABO group-compatible red blood cell components, ABO group-specific whole blood, or *low titer group O whole blood* (for non-group O or for recipients whose ABO group is unknown). This has been changed to allow for the growing practice of giving group O whole blood to trauma patients. A related standard is: **5.27.1.1 If low titer group O whole blood is used, the BB/TS shall define low titer group O whole blood and shall have policies, processes and procedures for: 1) The use of low titer group O whole blood, 2) The maximum volume/units allowed per event, and 3) Patient monitoring for adverse effects.** This is a new standard.

5.19.3.1 Methods known to prevent transfusion associated *graft-vs-host disease* (GVHD) shall be used and include either irradiation *or the use of a pathogen reduction technology* that is known to inactivate residual leukocytes and is cleared or approved by the FDA or Competent Authority. This is a new standard that recognizes the increasing use of pathogen reduced platelets and their effectiveness in preventing GVHD.

7.3 The BB/TS shall use *nationally recognized classifications* for donor and patient *adverse events*. This is a change – the previous versions of standards did not require the use of nationally recognized classifications. These can be found in various places such as the CDC website: **https://www.cdc.gov/bloodsafety/basics.html**

Two new standards relating to *proficiency testing*: **5.1.2.1.1 When an external proficiency testing program is not available, there shall be a system for determining the accuracy and reliability of test results.** And **5.1.2.1.2 Proficiency testing shall include comparison of test results from an outside laboratory.**

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Molecular Testing in the Blood Bank: Where are we in 2018?

William Crews, MD

Red blood cell genotyping predicts the antigen phenotype of the red cell by analyzing the portion of DNA that codes for red cell proteins/antigens.

Carter BloodCare has performed red cell genotype testing for 10 years. Initially we used this testing to phenotype blood donors to increase our "rare unit" inventory. Over the years it became evident that genotyping could supplement traditional serologic testing for patients that required complex serological tests such as adsorptions and elutions.

While serology remains the gold standard for ABO and Rh typing, antibody screening, and compatibility testing for transfusion, genotyping can be utilized as part of pretransfusion testing for certain patients. In our reference lab we commonly perform genotyping for patients who require chronic transfusion, have an autoimmune hemolytic anemia, have an alloantibody to a high-prevalent antigen, have discrepant serology results or have recently been transfused. The benefits of genotyping these patients are detailed in the table below.

Patient Challenge	Genotyping	Benefit
Recently Transfused		Accurately determine blood group genotype of recipient
Chronic Transfusion (i.e. sickle-cell patient)		Allows easier provision of phenotyped-matched red cells
Autoimmune Hemolytic Anemia		Labor-intensive and time-consuming procedures do not have to be performed every time
Alloantibody to high-prevalent antigen		If rare anti-sera is unavailable donor unit can be phenotyped
Discrepant serology results		Helps distinguish autoantibody from alloantibody

In fact, genotyping proved so beneficial that in 2015 we implemented a new protocol we termed Modified Pretransfusion Workup (modified workup). If we feel a patient can benefit from a modified workup, during the initial serological workup we perform an antibody screen, DAT, and if necessary, an elution and/or adsorption. Red cells are crossmatched, and genotyping is performed in case the patient was referred for future reference testing. If the patient requires transfusion on a subsequent admission the ABO type and DAT are repeated, if there is no change from previous results or strength of reaction, then no further serological testing is performed and antigen-matched units are issued in lieu of performing a crossmatch.

We feel the modified workup improves the quality of patient care by reducing the turnaround time of compatible red cells, allowing the patient to be transfused sooner. The modified workup also allows for significant decrease in the cost of pretransfusion testing since the reference staff does not have to repeat time-consuming procedures each time subsequent testing is requested on a previously genotyped patient.

Available tests for genotyping continue to grow. In November of 2017 we expanded our molecular test menu and began offering weak D genotyping. The weak D test can identify six variants of the RHD gene, and provides the predicted phenotype for RHD weak types 1,2, and 3. The test also predicts if a patient has a RHD deletion, or has the RHD Pseudogene.

Weak D genotyping is a great test to determine if a patient can safely be transfused Rh-positive red cells, or if administration of RhIg is necessary in women who are pregnant. We recommend weak D genotyping in the following situations:

- *When there is a discrepancy in the patient's Rh type*
- *When variable reactivity with multiple reagents is seen*
- *When Rh immediate spin is negative, but IAT is positive*
- *When Rh type is unknown*

The use of genotyping in the blood bank has steadily become more common, and has proven to be an invaluable supplement to serologic testing. The prediction of HPA-1a and HPA-1b phenotype testing is also now available, while this test is predominantly used for donors it can be utilized in the patient setting. With the continued development of specific tests available by genotyping, and the expected increase of information able to be obtained, genotyping will soon be essential instead of optional for donor and patient testing.

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PHYSICIAN RESOURCES

Download updates from Carter BloodCare and AABB.

- Circular of Information – October 2017
- Comments on Suggested Changes to the Standards for Blood Banks and Transfusion Services, 31st edition

What topic do you want included in the next issue of Blood Matters?

A) Irradiation Practices **B)** Cryoprecipitate **C)** Sickle Cell Transfusion Protocols **D)** Other

Click **here** to submit your choice. If you answered ***D (Other)***, remember to include your topic.