HIGHLIGHTS FROM THE 2017 AABB ANNUAL MEETING

OCTOBER 13-16
SAN DIEGO, CA

Each year, the AABB Annual Meeting includes sessions on innovative research in transfusion medicine and cellular therapies and provides on-site confirmation of CME/CE credits and access to networking events where attendees can interact with thousands of colleagues from throughout the world. Attendees include CEOs and medical directors, laboratory supervisors and administrators, transfusion specialists, CT and blood banking professionals, medical technologists, donor recruiters, physicians, nurses and other health care providers. Included in this preview are a few highlights from the 2017 AABB Annual Meeting.
Old Blood? New Blood? Is it the End of the Beginning of the Storage Lesion?

http://blog.aabb.org/old-blood-new-blood-is-it-the-end-of-the-beginning-of-the-storage-lesion/

The debate over old versus fresh blood is older than, well, the longest stored blood. At the session on RBC Storage Lesion: The End of the Beginning, James Zimring, MD, PhD; Jason Acker, MBA, PhD; and Harvey Klein, MD, dove headfirst into the controversy.

Zimring reviewed the history of blood transfusion, particularly recognition of the storage lesion when the field of metabolomics showed an inflection point between blood stored for 14 versus 21 days. Care of chronically transfused patients with sickle cell disease led to a better understanding of the relationship between storage age and iron increases as a function of storage time and iron toxicity in. This decades-long history leaves us with the knowledge that the storage lesion comprises thousands of changes and varies based on donor and storage system. However, research also shows that the freshest blood does not necessarily lead to better outcomes compared with longer-stored blood, and may, in fact, lead to worse outcomes in certain patient populations.

Acker discussed what we know so far about the quality of stored RBCs, including the fact that when it comes to stored blood, there is no universally agreed upon definition of “quality.” Putting that aside, there is agreement that the duration of storage affects the quality of RBC products. Other factors that affect outcome that haven’t been adequately addressed by research include manufacturing method, donor age and sex, and recipient characteristics. New technologies, such as photoacoustic microscopy, may help us better assess RBC product quality at the individual cell level.

Klein summarized findings from studies of RBC storage age and the clinical implications of transfusing fresher versus older stored RBCs in different patient populations, including cardiac patients, premature infants and critically ill adults. He discussed complete and ongoing studies addressing questions of whether RBCs stored longer are effective at increasing tissue oxygenation and if old blood is associated with more adverse events than fresher units.

Do stored RBCs optimally increase tissue oxygenation?

The Age of Red Blood Cells in Premature Infants (ARIP) study showed no differences in composite primary outcome, intraventricular hemorrhage, positive cultures and clinically suspected infections in 377 very low birthweight premature infants. Similarly, the Age of Transfused Blood in Critically Ill Adults (ABLE) study found no difference in outcomes between blood stored longer and fresher blood, nor did the Effects of Red-Cell Storage Duration on Patients Undergoing Cardiac Surgery (RECERSS) study, the Effects of Short-Term vs. Long-Term Blood Storage on Mortality after Transfusion (INFORM) study or numerous other studies. The overall conclusion from this research is that fresher blood is not superior to standard-issue blood in the clinical settings studied. However, many questions remain. Do stored RBCs optimally increase tissue oxygenation? Does the oldest stored blood — 35-42 days — cause adverse effects? What are the clinical effects of older blood in other clinical populations? For example, data from an experimental canine model suggests older RBCs may cause injury when they hemolyze and release iron, resulting in bacterial growth.

Klein believes that the age of stored blood may be a U-curve, with the oldest and newest blood being associated with worse outcomes. While the issue of storage age remains contentious, most everyone agrees that more research is needed.
One of the more vexing questions facing blood collection facilities is how to assess anti-HLA antibodies in transgender donors to minimize TRALI risk. Researchers at the American Red Cross (ARC) presented data on the risk of not asking transgender (TG) males (birth gender female) about pregnancy. TG males may have had prior pregnancies or conceived after transition from female to male. The researchers identified individuals in their donation database (or were identified by collections staff) who had changed gender. Donors were contacted to resolve discrepancies. TG male donors who answered yes to the pregnancy question were identified and any HLA test results were reviewed. From 2013 to 2015, 181 individuals who had changed gender were identified. Of these, 121 donors had changed their gender from female to male. Seven TG male donors (6%) answered Yes to the pregnancy question. One donor tested positive for HLA antibodies; two did not. The remaining four had not been tested, and an HLA test was requested to be performed at the next donation, said Kathleen Grima, MD, who presented the research. Grima is the executive medical director at ARC and medical director of The Brooklyn Hospital Center Blood Bank.

The researchers also identified donors who requested their gender be changed from female to male after May 2016, when FDA’s Final Rule went into effect. In the rule, FDA recommended to blood establishments that “in the context of the donor history questionnaire, male or female gender should be self-identified and self-reported for the purpose of blood donation.” HLA testing was requested for the next donation, Grima reported. A total of 326 such donors were identified. Five (1.5%) answered Yes to the pregnancy question, 56 answered No and 265 did not answer. Testing for HLA antibodies was performed for 101 TG male donors with 13 positive results. Two of these donors had answered Yes to the pregnancy question, four had answered No, and seven had not answered.

Including both time periods, of 447 identified TG male donors, 3% answered Yes to the pregnancy question. One percent of TG male donors tested positive for HLA antibodies.

When a donor requests a gender change from female to male, an HLA test is requested for the next donation, said Grima. However, because first-time donors are qualified based on their stated gender, unless a transgender donor volunteers information about prior pregnancy, this information can easily be missed. Other possible identification strategies include asking all donors about pregnancy; continuing to ask donors about their birth gender and require answers to both male and female questions; simply opting not to accept donations from transgender individuals; or treating all transgender donors as female donors.

**Early Effects of Policy Change to 1-Year Deferral for MSM**

During the same session, 2017 Hemphill-Jordan Leadership Award winner Brian Custer, MPH, PhD, director of epidemiology and policy science at Blood Systems Research Institute, shared results from an initial assessment of the effects resulting from FDA’s policy change from an indefinite donor deferral to a 1-year deferral for men who have sex with men (MSM). While the number of MSM donors who met the 1-year deferral requirement was too small to draw conclusions, early data suggest higher rates of prevalent infection in some first-time MSM donors. Additional analyses are needed though, said Custer.

At BSI, where the 1-year deferral has been in place for more than a year, MSM deferral rates have declined. A small number of donors qualified to be reinstated; reinstatement has yet to taper off. Continuous monitoring of MSM deferral rates and infectious disease tracking are key to assessing the effectiveness of the new MSM policy.
Patients with rare blood types, multiple antibodies or antibodies to high prevalence antigens present health care providers can often present treatment challenges. In the Sunday session “Personalized and Precision Medicine Converge to Meet Rare Blood Needs,” a team of speakers outlined medical mysteries solved with the help of personalized and precision medicine. David Friedman, MD; Sandra J. Nance, MS, MT (ASCP)SBB; and Margaret A. Keller, PhD, walked attendees through four rare-blood cases treated at the Children’s Hospital of Philadelphia.

One such case was that of a 21-year-old woman from Qatar who arrived in the United States for a scheduled spinal fusion and thoracic expansion with VEPTR. The surgery was successful, but just days after the operation, the patient developed complications and was transfused with a unit of O Rh(D) positive blood. Eight days later, following surgical exploration for drainage and the possible removal of the VEPTR hardware, hemoglobin (Hgb) levels had dropped to 79 gm/dL. Fifty mL of group O Rh(D)- blood was transfused, but the specimen had grossly hemolyzed by the next day.

The care team utilized extensive serological testing to better understand the patient’s blood. The team determined that they would need to identify additional En(a-) blood donors. When a request through the American Rare Donor Program returned no matches, doctors started an international search for a donor match. Canada identified a match, as did the UK, and medical providers in Qatar tested a number of samples from the patient’s family members who quickly exhausted the serum sample. The doctors in the U.S. screened the remaining samples from family members and identified one who was a match. At the same time, blood from the Canadian donor was send to the U.S. and transfused.

Seven months after surgery, the patient returned to the U.S. where she was admitted for persistent wound drainage, potentially requiring an additional blood transfusion. Doctors put in a request with FDA to import a unit of blood from the Qatari family member identified as a match, but a transfusion was not required. After surgery, the patient cleared the infection and was able to return to home.
The availability of blood products, as well as ensuring the safety of blood transfusion, is often a significant concern in times of humanitarian emergencies. During the Monday morning session, “Availability and Safety of Blood Transfusion in Humanitarian Emergencies,” three speakers – Christopher Gresens, MD; Yetmgeta E. Abdella, MD, MPH; and Cees Smit Siblinga, MD, PhD, FRCPEdin, FRCPath – spoke about the unique challenges associated with blood delivery during emergencies.

Humanitarian emergencies can result from both natural disasters, such as earthquakes or hurricanes, as well as manmade disasters, such as war or terror attacks. In the aftermath of such events, there may be various factors making the delivery of blood more complex. As the speakers mentioned throughout their talks, these include limited access to patients, mass population displacement, ongoing insecurity and decreased financial resources for health care. In addition, there may be a weakened health care system, damaged infrastructure, outbreaks of infectious diseases, and limited electricity and safe water.

Despite the myriad challenges during such times, a humanitarian emergency is often associated with an increase in trauma-related injuries, many of which may require blood transfusions. Efforts to maintain systems to deliver blood during emergencies often require additional coordination, security and collaboration between various partners.

As the speakers mentioned, nations that already have strong blood-delivery infrastructure in place, as well as a plan for dealing with the possibility of emergencies, may be most successful when challenges arise. However, many developing countries face challenges with blood delivery already; these resources may be stretched thin during a humanitarian emergency.

New programs are being developed to ensure the safety and availability of blood throughout the world during humanitarian emergencies. The WHO-sponsored “Strategic Framework for Blood Safety and Availability 2016-2025” is designed to offer guidance and recommendations for securing the blood supply in the aftermath of an emergency, as well as offer channels for collaboration between nations to maintain the blood supply during such times.
INFORM: No Difference in Mortality Seen with Exposure to “Oldest” Old Blood vs. Freshest

More evidence for the safety of older RBCs comes from a pre-specified exploratory analysis of data from the nearly 25,000-patient INFORM trial. The researchers found no significant difference in in-hospital mortality (hazard ratio, 0.92) between patients given blood with a median age of 36-42 days old versus those receiving median-aged blood of 7 days or less. The same was true for maximum age-blood exposure (HR, 0.92).

These findings, presented during an oral abstracts session, suggest that “current approaches to blood storage and inventory management are reasonable,” said lead author Nancy Heddle, MSc, FCSMLS(D), who is a professor of Hematology at McMaster University in Ontario, Canada. The analysis was also published in The Lancet Haematology.

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The effects of transfusing the “oldest” old blood — between 35 and 42 days — has long been controversial. Previous RCTs have shown little difference in outcomes with fresher versus older blood in several different patient populations. However, some have criticized that no studies have looked at the question of potential harm from exposure to the oldest old blood compared with exposure to the freshest old blood.

In the INFORM trial (Informing Fresh Versus Old Red Cell Management), 24,726 patients were randomized to receive either the freshest available or oldest available RBCs. For this analysis, the researchers analyzed mortality rates for different exposures using Cox regression. The primary analysis compared in-hospital mortality among patients who received median/maximum age blood in three groups: blood exclusively 7 days or younger, 8-35-day-old blood and blood aged 36-42 days. They controlled for patient age at admission, sex, diagnosis, transfusion of ABO non-specific blood, platelet transfusion and plasma transfusions.

Heddle noted that the analysis has several limitations. The collected data does not allow researchers to assess impact on morbidities, such as infection or organ failure, and the possibility of confounding variables that were not accounted for (leading to model misspecification). Finally, the question of harm from exclusive exposure to RBCs older than 35 days remains unanswered.
ISBT and AABB Tackle Donor Deferral and MSM Donors

Follow advances in the accuracy and speed of HIV testing, governments from across the globe have been debating how to update their donor history questionnaires (DHQ) to maximize the number of donations while maintaining patient safety. Much discussion has centered around the community of men who have sex with men (MSM), who are eligible to donate to donate in the U.S. after a 12-month deferral period.

Attendees packed the room to hear the AABB/ISBT Joint Session, “Men Who Have Sex with Men: Is Individual Risk Assessment on the Horizon?,” where speakers discussed the evolution of MSM donor deferral and several of the issues facing the blood banking community as it considers future blood donations from MSM donors.

Louis M. Katz, MD, spoke about the impact of behavior-based deferral questions in the early stages of the HIV outbreak and potential courses of action in the wake of advances in HIV testing. In countries that have reduced the deferral period, models that predict numbers of HIV-positive donations before and after MSM deferral changes overestimated the number of HIV-positive donations. This has only intensified the debate around individual risk assessment.

Several countries have previously implemented deferral periods of 12 months or fewer, while others have implemented behavior-based deferrals. Pierre Tiberghien, MD, PhD, shared the latest data from France, which previously reduced its deferral period for MSM donors of red blood cells and eliminated the deferral period for platelet apheresis donations. The MSM donor deferral rate in France remains high, but Tiberghien believes it is too early to draw conclusions about the new policy.

With technology advancing quickly, individual risk assessment for MSM donors is a growing possibility. Sheila O’Brien shared how blood centers could administer the DHQ in ways that accurately capture sensitive donor information while allowing low-risk MSM to donate.

The session ended by looking to the future. Dana Devine, PhD, discussed the establishment of a Canadian MSM research program. The program is funding several studies that seek to inform the development of an individual risk assessment donor policy, to evaluate operational feasibility of potential donor deferral policies, and risk modeling and surveillance to assess the risk associated with donor selection policies.

The Canadian studies are ongoing, and the U.S. may not be far behind. Several federal agencies, including FDA and NHLBI, are open to funding research into MSM donors if investigators identify clear research goals.

Fun with Serological Testing Education

There’s much to learn about serological testing, and here at AABB’s 2017 Annual Meeting, we like to have a little fun with it. For the second year in a row, it was “All Aboard the Hogwarts Express” with the Harry Potter-themed session, “Hogwarts School of Antigens and Antibodies.”

In this session, the speakers – Sue Johnson, MSTM, MT(ASCP) SBB; Monica Kalvelage, MT(ASCP)MB,SBB; Rebecca Coward, MT(ASCP)SBB; and Jayanna Slayten, MS, MT(ASCP)SBB – presented case studies to the audience, challenging their blood banking wizardry skills. Of course, this being the Harry Potter-themed session, the presenters dressed in Hogwarts robes, wizard hats and even used their wizard wands.

Although the session was peppered with lighthearted wizardry fun and many references to the world of Harry Potter, the issues presented represented real concerns that blood bankers often face with patients. Many of the case studies assessed audience members’ knowledge of pretransfusion and prenatal testing. Through the interactive audience response tool, attendees answered questions and were able to compare their responses with those of the rest of the audience. A panel discussion followed each question, helping to promote knowledge about serological practices.

At the end of the session, all attendees “graduated” from their “second year at Hogwarts.” This popular session will be back again at next year’s Annual Meeting for members to complete their third year at wizardry school. Let’s just hope Voldemort doesn’t find out about it.
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Highlighted Events:

- Pre-Meeting Receptions
  Fri. 5:30 pm – 7:00 pm
- New Member Lunch *
  Sat. 11:45 am – 1:15 pm
- General Session featuring Keynote Shawn Achor
  Sat. 3:30 pm – 5:00 pm
- Exhibit Hall & Opening Night Reception
  Sat. 5:30 pm – 7:30 pm
- NBF 5K Run for Research
  Sun. 7:00 am
- PEP Welcome Happy Hour
  Sun. 7:30 pm – 9:00 pm
- PEP Member Mingle *
  Mon. 1:00 pm – 2:00 pm
- Business Meeting & Lunch
  Tues. 12:30 pm – 2:00 pm

* AABB Member Only Events

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The 2018 AABB Annual Meeting, to be held Oct. 13-16 in Boston, will offer more than 140 educational programs, including **four** pre-meeting workshops, **five** joint sessions and **five** roundtable discussions.

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