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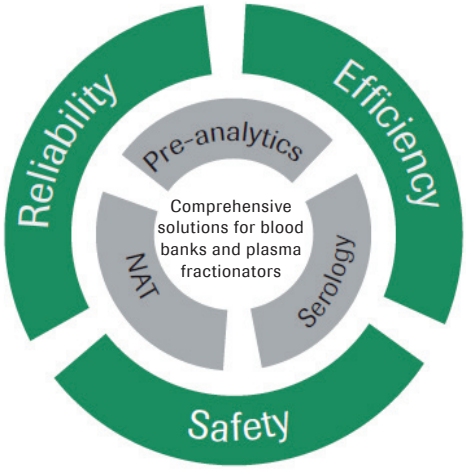

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President Ravi Reddy **Secretary General** Roger Dodd **Executive Director** Judith Chapman
Design drukkerij Teewes **Photography** Transfusion Today **Advertising** Monique van Dorp, communication@isbtweb.org

Send all correspondence to ISBT - Marnixstraat 317, 1016 TB, Amsterdam, the Netherlands.
T + 31 20 7601 760, F + 31 20 7601 761, communication@isbtweb.org.

Judith Chapman

Editorial

Paediatric and neonatal transfusion does not receive as much attention as it deserves, I am therefore delighted that the focus section of this issue of Transfusion Today has a number of articles devoted to the topic. Articles from Africa, India and Brazil are included identifying challenges for paediatric and neonatal transfusion in these places. I hope that you find the articles interesting and useful in your day to day work in transfusion medicine.

There are six reports from events supported by the ISBT Academy, including Pakistan, Cyprus, Brazil, Australia, India and Russia. ISBT has funding through the ISBT Academy to support educational events. Application is simple – just complete the online application form and include the required supplementary information. Our aim is to have at least one Academy event in each WHO region each year with a target of at least 16 Academy events per year.

And last but by no means least there is information on the 27th Regional Congress of the ISBT to be held in Copenhagen in June 2017. We do hope that you will join us for what will be an exciting scientific programme with many speakers new to an ISBT congress. You will have the opportunity to meet and network with fellow transfusion professionals from around the world. Once again there is a programme for young investigators and for transfusion practitioners. Alongside the scientific programme there will be a large exhibition with the latest analysers and equipment available to view. Copenhagen is a great city to visit, we look forward to welcoming you.

Gemma Crighton
Clinical Research Fellow
Australian Red Cross Blood Service
and Transfusion Research Unit

Amy Keir
Consultant Neonatologist,
University of Adelaide

Neonatal red cell transfusion: an overview

Preterm infants are at risk of anaemia due to lower haemoglobin (Hb) levels at birth compared with term infants due to impaired erythropoiesis, reduced iron stores and iatrogenic phlebotomy blood loss. Red blood cell (RBC) transfusions are frequently given to neonates with anaemia with at least half of infants <30 weeks' gestation and more than 80% of infants with a birthweight of <1000 g receive at least one RBC transfusion. The majority of RBC transfusions are small volume transfusions (10-20mL/kg).

Transfusion triggers in neonates

Considerable variability in practice persists throughout neonatal units likely reflecting the limited high-quality evidence available around the benefits and potential harms of RBC transfusion. There remains no universally accepted Hb transfusion threshold for neonates. Hb triggers frequently consider postnatal age, gestational age, Hb or haematocrit and level of respiratory support. Two recent international guidelines have systematically reviewed this literature and provide guidance in this area; however, they have drawn slightly different conclusions and provide different Hb thresholds.1,2 Restrictive transfusion thresholds reduce the number of RBC transfusions received, but the effect on short and long term outcomes is unknown. With the evidence base lacking to assist healthcare professionals to make decisions about when to transfuse neonates, guidance is still required. Table 1 outlines pragmatic transfusion thresholds for clinical use taken from the Australian evidence-based patient blood management guideline.

Two multi-centre randomised controlled trials, the Effects of Transfusion Thresholds on Neurocognitive Outcome of extremely low birth weight infants (ETTNO) and the Transfusion of Prematures trial (TOP) examining the short and longer term outcomes in extremely low birth weight infants randomised to liberal or restrictive RBC transfusion thresholds are underway. These trials should provide invaluable information to guide neonatal transfusion practice.

The use of local blood transfusion policy and auditing practice to ensure compliance has been shown to reduce the number of neonatal RBC transfusions without increasing rates of adverse outcomes.

Known and emerging adverse effects/associations of neonatal RBC transfusion

RBC transfusion may be associated with many adverse outcomes, of which a number are particularly relevant to this vulnerable patient population including transfusion-associated graft versus host disease, transfusion-associated circulatory overload and infectious diseases.

Many adverse associations and outcomes potentially related to neonatal RBC transfusions, including the development of necrotizing enterocolitis (NEC), intraventricular hemorrhage, retinopathy of prematurity and chronic lung disease. A recent systematic review did not find statistically significant differences in these previously described adverse outcomes between neonates exposed to restrictive and liberal RBC transfusion practice. However, the risks of bias identified in the included studies, lack of consistent reporting and definitions of adverse events limited the conclusion of the review. Haemovigilance data published recently from the Serious Hazards of Transfusion (SHOT) scheme from the United Kingdom highlights that transfusion reactions, usually observed in adults, do occur in neonates.

Age of red cells

Several studies have examined the optimal length of RBC storage prior to transfusion. A recent systematic review has compared fresher versus standard issue RBC transfusion in neonates. Clinical outcomes and mortality were not improved with fresher issued blood and subsequently the AABB recommends that neonates should receive standard issue RBCs rather than limiting patients to only fresh (<10 days old) RBC units.18

Conclusion

Neonates are a frequently transfused patient population and evidence for benefit of RBC transfusions in this group is particularly limited. All RBC transfusion carry potential risks and each transfusion should be carefully considered. Studies currently underway will hopefully provide more guidance as to whether it is possible to reduce RBC transfusion rates using restrictive transfusion thresholds, without increasing the risk of long term outcomes.

Table 1: Haemoglobin thresholds for transfusion in preterm and term neonates

Postnatal week	Hb (g/L)	
	No respiratory support	Respiratory support of any kind
1	100–120	110–130
2	85–110	100–125
≥3	70–100	85–110

* This table is based on/includes The National Blood Authority's Patient Blood Management Guidelines: Module 6 – Neonatal and Paediatrics.

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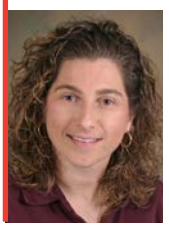
Ruchika Goel
Assistant Professor of Pathology and Laboratory Medicine
Weill Cornell Medical College, Cornell University



Cassandra D. Josephson
Professor Pediatric Transfusion Medicine, Emory University School of Medicine

Challenges In Pediatric Transfusion: From The Fetus To The Adolescent, Catering To One And All

Transfusions of red blood cell (RBCs), platelets, and plasma are critical therapies for pediatric populations with a wide scope and applicability ranging from intrauterine transfusions, to transfusing preterm neonates in the Neonatal Intensive care unit (NICU), to treating the critically ill child in the Pediatric ICU (PICU) on extracorporeal membrane oxygenation, to the child/adolescent/young adult in need of a solid organ or hematopoietic cell transplant.

With the above varied spectrum of indications, Pediatric Transfusion Medicine (PTM) is not just about 'transfusing little adults'. Rather, PTM has been acquiring an identity as a subspecialty/independent discipline over the past few decades, especially gaining momentum over the past 5-10 years with dedicated pediatricians, neonatologists and transfusion medicine specialists committed to advancing the clinical care as well as research in this field. The adoption of a policy by US National Institutes of Health (NIH) requiring investigators to either include pediatric subjects in research or provide an explanation for their exclusion has also fueled the development of PTM as a discipline.

In 2009 and 2015, the National Heart, Lung, and Blood Institute(NHLBI) convened State-of-the-Science Symposia in Transfusion Medicine to identify Phase II and/or III clinical trials that would be critical to advance transfusion medicine; and pediatric and neonatal subcommittees were among the 7 disciplines to develop proposals.

We aim to provide a brief preview of the current clinical and translational PTM research gaps which is considered to be of high priority by pediatricians, neonatologists, and transfusion medicine specialists in the United States and around the world.

A. The optimal RBC transfusion strategies and thresholds for preterm and term neonates and effect of liberal versus conservative RBC transfusion on survival and neurodevelopment outcomes needs further refinement. Two large, ongoing randomized controlled trials (RCTs), the Transfusion of Prematures (TOP) and Effects of Transfusion Thresholds on Neurocognitive Outcome of Extremely Low Birth Weight Infants (ETTNO) trials are expected to bridge critical gaps in this literature.

B. PLT transfusion strategies to prevent or treat bleeding in neonatal patients: There is lack of consensus regarding the platelet count threshold below which neonates should be transfused to prevent bleeding. While in adults, there are many platelet transfusion trigger studies, in preterm infants only, one small and underpowered randomized control trial (RCT) was conducted over two decades ago which reported no difference in severity and incidence of intraventricular hemorrhage (IVH) in very low-birth-weight (<1.5 kg at birth) infants when the platelet count was maintained greater than 150 × 109/L vs allowed to fall to less than 60× 109/L before prophylactic platelet transfusions. Currently, PlaNeT-2 (platelet transfusion practice in neonates) study in the United Kingdom, a large multicenter RCT study comparing liberal vs restrictive prophylactic platelet transfusion strategies (50 vs 25×109/L) in preterm infants is being conducted and results are eagerly awaited [1].

C. Neonatal and Pediatric Plasma Transfusion: What is the evidence, if any? Plasma transfusions are widely given to neonates and in a majority of cases administered prophylactically to 'fix' abnormal coagulation lab tests (for which references ranges are not even validated) and reduce the 'assumed' bleeding risk, despite very limited evidence base to support its effectiveness. High quality evidence supporting or refuting this practice is needed.

D: Storage Age of RBCs transfused to neonates and children: This remains a highly debated topic with most recent literature in adults refuting the hypothesis of worse clinical outcomes on transfusing 'old' as compared to 'fresh' blood. In pediatrics, the largest study till date, the ARIPI (Age of Red Blood Cells in Premature Infants) trial has been from Canada and reported that the use of fresh RBCs compared with standard blood

bank practice storage did not improve outcomes in premature, very low-birth-weight infants requiring RBC transfusion. However, there remain multiple critiques about the validity and generalizability of the study. The ABC-PICU (Age of Blood in Children in Pediatric Intensive Care Units) study, a multi-center, double-blind, RCT comparing the risk of new or progressive multiple organ dysfunction syndrome between critically ill children transfused fresh versus standard issue RBCs is ongoing in Canada, United States, and in Europe[2].

E: 'BIG DATA' in PTM: Need for better baseline data and databases to support retrospective and longitudinal studies in neonates to young adults receiving blood products. As duly identified by the NHLBI seminars, due to smaller sample size, difficulty in getting IRB approvals, consent and very slow enrollment, randomized trials in neonates and children are very difficult to perform in the first place and many a time remain underpowered to study the various outcomes. So there is a tremendous value to having large databases and registries which allow retrospective as well as longitudinal analysis as a feasible option while appropriately acknowledging the multiple inherent limitations of such study designs. Some of the nationally representative databases e.g. KID and PED NSQIP are key potential treasure chest and tools that could help to answer some vital PTM questions.

In sum, despite being a highly transfused patient group, pediatric and neonatal transfusion and blood management practices remain relatively understudied and underrepresented areas of transfusion medicine as majority of clinical practices continue to extrapolate results from adult studies. There is not only a compelling need for concrete, evidence-based opportunities for filling the above identified gaps in knowledge, but also eventual dissemination of the research to ensure translating and incorporating the evidence into routine practice of Pediatric and Neonatal Transfusion.

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Helen New
Consultant in Paediatric Transfusion, NHS Blood and Transplant
Honorary Senior Lecturer, Imperial College, London, UK

Simon Stanworth
Consultant Haematologist
NHS Blood and Transplant
Oxford University Hospitals NHS Trust, Oxford University, Oxford, UK

Transfusion guidelines for neonates and children: the UK perspective

Why do we need specific transfusion guidelines for neonates and children? The decision to transfuse is a balance of risks and benefits, taking into account the clinical situation, the 'appropriate' transfusion threshold, and whether there might be alternatives. However extrapolating from adult data may not be appropriate for paediatric recipients, in particular neonates, who are developmentally immature with unique physiological characteristics. Many countries use special components for neonates and infants with additional safety features. In the UK there are a number of ongoing initiatives aimed at developing and improving paediatric transfusion practice but considerable challenges remain, many of which are common in all countries.

The UK 'NICE' transfusion guideline (NICE, 2015) included both children > 1 year and adults but most paediatric recommendations were extrapolated from adults due to lack of specific evidence. More recently, revised UK paediatric transfusion guidelines have been published (New et al, 2016). These provide guidance for clinical and laboratory staff on most aspects for fetuses, neonates and older children, including the laboratory and blood components. As well as evidence on indications for transfusion from systematic reviews, they take into account information from the UK programme of National Comparative Audits on clinical use and administration of blood, and on risks of paediatric transfusion highlighted by reports to the Serious Hazards of Transfusion (SHOT) national haemovigilance scheme (Bolton-Maggs et al, 2015).

A common feature of paediatric transfusion guidelines has been recognition that much practice is based on consensus rather than high quality evidence. A number of key red cell transfusion randomised controlled trials (RCTs) supporting restrictive haemoglobin (Hb) thresholds for neonatal red cell transfusion (Whyte and Kirpalani, 2011) have been completed, with others powered for long term outcomes underway. In the UK (and Ireland and The Netherlands) an RCT of prophylactic platelet thresholds for preterm neonates is completing recruitment (Curley et al, 2014).

Key recommendations of the UK 2016 guidelines include restrictive Hb thresholds for preterm neonatal red cell transfusions based on postnatal age and level of respiratory support, consistent with RCT evidence and neonatologists' practice yet not too complex to be practical. For older acutely unwell children, a restrictive pre-transfusion Hb threshold of 70g/L in stable non-cyanotic patients is recommended, supported by the TRIPICU study (Lacroix et al, 2007). This also applies to peri-operative patients without major co-morbidity/bleeding and to non-cyanotic children following cardiopulmonary bypass. To reduce transfusion in children undergoing surgery with risk of significant bleeding, tranexamic acid should be considered (although the appropriate dose is unclear), and cell salvage for those who may require transfusion. Recipients under 1 year should be transfused components with neonatal/infant safety specification, but if specific components are not available in emergency pre-agreed hierarchies of alternatives should be used.

The UK guideline writing group was challenged by selected areas with insufficient evidence. These include Hb thresholds for paediatric haematology/oncology and stem cell transplant patients, and for children with cyanotic cardiac disease following cardiopulmonary bypass. With this in mind, the guidelines also make a number of 'practice statements'. For older non-bleeding children, calculating the transfusion volume to aim for an Hb increase of no more than 20g/L above the transfusion threshold is suggested, in line with increasing acceptance that for adults it may be prudent use single unit transfusions (NICE 2015), although how to apply in practice remains an area of controversy.

Finally, it is recognised that whilst 'patient blood management' (PBM) is now a common tenet for adults and reduces inappropriate transfusion, application of this initiative to children (and neonates) is less widespread. There is considerable scope to develop a paediatric specific agenda for PBM supported by transfusion guidelines and this will be a focus for development and education in the UK over the next few years.

Sophie Uyoga
KEMRI-Wellcome Trust Research Programme, Kilifi, Kenya

Kathryn Maitland
KEMRI-Wellcome Trust Research Programme, Kilifi, Kenya

Transfusion issues for African Children: the need for more research

In sub-Saharan Africa, severe anaemia in children is a leading cause of hospital admission, a major cause of mortality, and is responsible for a high proportion of the 660,000 malaria-related deaths that are estimated to occur each year. Although timely transfusion can be life- saving, equitable access to adequate supplies of safe blood for transfusion remains a key challenge in sub-Saharan Africa. In order to preserve this scarce resource and to reduce the risk of transfusion-transmitted infections, guidelines developed by the World Health Organization (WHO) encourage the rational use of blood transfusion restricting routine transfusion those with a haemoglobin less than 4 g/dl or 4-5g/dl if they have additional signs of severity. Since, these recommendations are not evidence-based it has been frequently reported that adherence to the WHO guidelines is unsatisfactory. Since data are generally lacking on the timing of blood transfusion and adherence to WHO guidelines, we used the data from the FEAST trial (a fluid resuscitation trial in African children) to provide a detailed description of these aspects. We found that 70% and 12% of children with moderate anaemia (5-7g/dl) and mild anaemia (7-10g/dl) respectively received a transfusion in their first 24 hours of hospital admission. Thus, adherence to WHO recommendations was poor. We also observed that only 94% of children with severe anaemia (Hb <5g/dl) received a transfusion. In those who did receive a transfusion 52% died within 8 hours, with 90% of these deaths occurring within 2.5 hours of hospital admission, emphasizing the need for rapid recognition and prompt blood transfusion. However, in many circumstances children died before blood for transfusion became available. This highlights the need for doctors to adhere to the current WHO guidelines which were developed in order to preserve transfusion for those in greatest need. Overuse of blood for transfusion in children who do not have severe anaemia reduces the resource available for emergency transfusion. Furthermore, of those with severe anaemia who received a blood transfusion (94%) nearly one third of children required 2 or more transfusions to correct their severe anaemia. The high rates of re-transfusion suggest that current recommendations for 20mls/kg whole blood or 10mls/kg packed cells significantly undertreats a proportion of severely anaemic children. A higher initial transfusion volume of whole blood (30mls/kg) prescribed at hospital admission in children with severe was found to be safe in a clinical trial and compared to children receiving standard volume (20mls/kg) the higher volume resulted in an accelerated haematological recovery in Ugandan children with SA. Nevertheless, evidence is still lacking on what haemoglobin threshold criteria for transfusion and volume are associated with the optimal survival outcomes. More research is needed, particularly in African children, to determine which children need transfusion and which children with severe anaemia can safely be treated with other supportive therapies. These questions are currently being examined in the randomised controlled TRACT trial (ISRCTN84086586) which involves nearly 4000 children admitted to hospital with severe anaemia in Uganda and Malawi. The overarching aim of the trial is to provide the evidence to inform or refine current recommendations for the rationale use of paediatric blood transfusion. The TRACT trial started in September 2014 and by the end January 2017 had enrolled 3724/3960 of study participants with recruitment and follow up to be completed by December 2017.

André Luís Albiero
University of São Paulo, Fundação Pró-Sangue/Hemocentro de São Paulo, São Paulo, Brazil

Platelet Transfusion in Neonatal Pediatrics

When I first started in Pediatric Blood Transfusion twenty years ago, little did I know that the challenging job of designing the best extremely-low-birth-weight (ELBW) newborn care model would become routine work. Since 70% of preterm neonates in intensive care units present thrombocytopenia, platelet concentrate (PC) transfusion is still highly required.

Albeit immature, the neonatal immune system is able to respond against PC-stemming HLA antigens before six months of age. Therefore, the risk for platelet concentrate transfusion refractoriness (besides potential infection hazards, TRALI and probably TRIM) should suffice to discourage liberal PC transfusion strategies.

Nevertheless, for prophylactic purposes, triggers higher than those suggested for adults are still helpful in spontaneous bleeding prevention, mainly intracerebral, due to newborn-primary-hemostasis flaws .

Prophylactic thresholds have been highly regarded, however very little is said about platelet amounts for bleeding prevention. SToP trial (performed on adults) has failed to determine the best option between low and high doses, indicating that custom dosage is possibly the most appropriate course of action.

I calculate doses (ml) through the following formula:

$$\frac{\text{(desired platelet count - observed platelet count) x 1.000 x volemia}}{\text{PPC x PPR}}$$

Units for platelet counts and volemia are mm-3 and ml-1, respectively. Product Platelet Content (PPC) is usually 1,0 x 109ml-1 or 1,5 x 109ml-1 for random PC or apheresis PC, respectively; such values can be fine-tuned. The standard Percent Platelet Recovery (PPR) must be adjusted in eighty percent (0,8). In the presence of the infant's own isohemagglutinin (or maternal) against incompatible ABO PC (or pathogen-inactivated PC), PPR should be set to 0,6 (60%). Platelet counts, at least within the first 24 hours following PC transfusions, are sound guidelines for PPR adjustments; extra doses prior to such counts are only justified if persistent bleeding is observed.

The desired platelet count varies according to transfusion goals: 100,000mm-3 in bleeding cases and preterm newborns, or 50,000mm-3, as a liberal prophylactic trigger. Lack of conviction surrounds the discussion between high (50,000mm-3) versus low (25,000mm-3) triggers for bleeding prevention (PLaNeT-2 multicenter trial results could settle the dispute). However, there is no evidence to support chained PC transfusions: every 12 hours, without blood counts in between them, at times, for days on end. Unfortunately, this sort of malpractice has become common place among Brazilian neonatologists and intensive care pediatricians.

In the absence of platelet dysfunction, when observed platelet counts and prophylactic or therapeutic goals with different values are inserted into the formula, a smaller PC volume is yielded. Without being restrictive, PC economy ranges from 30 to 60 percent when the custom dosage formula is employed, in compliance with patient blood management (PBM).

The employment of mathematical formulas is somewhat laborious and unpractical. As an alternative, some smartphone apps (available in app marketplaces through the keyword "platelet calculator") calculate PC doses with increased speed and accuracy, even for adults.

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Gopal Agrawal
Consultant Neonatologist,
Columbia Asia Hospital,
Palam Vihar, Gurgaon,India

Praveen Kumar
Professor, Department of Paediatrics,
Post Graduate Institute of Medical
Education and Research, Chandigarh,
India

Neonatal and Pediatric Transfusions in India

In Southeast Asia, blood is most commonly transfused for obstetric, paediatric, surgical and trauma cases. The annual requirement of blood in India is estimated at 12 million units. In children, thalassaemia major imposes the biggest challenge and at any given point of time 100,000 thalassaemics require regular transfusions while 10,000 new-borns with thalassemia major are added every year. A large proportion of very low birth weight sick infants receive at least one red blood cell (RBC) transfusion during their NICU stay. Although National blood policy exists since 2002 and a Haemovigilance program was initiated in 2012, numerous challenges exist to ensure safe and cost-effective utilization of this vital but scarce resource. Transfusion thresholds are based on few randomized controlled trials and mainly expert opinion. Restrictive guidelines have reduced number of transfusions and donor exposure by 70-80%, without any adverse impact on mortality or long-term outcomes. Few NICUs have adopted restrictive transfusion guidelines, but practices vary widely.
Single donor RBC units divided into multiple satellite packs have been demonstrated to decrease blood donor exposure and reduce wastage. This requires close collaboration between clinical team and transfusion department, and is rarely practiced. The issue of RBC storage age is particularly relevant for premature infants. Concerns have remained about transfusing blood more than 14 days old though studies have found no difference in outcomes between neonates transfused with older (≥14 days) compared to fresher (<14 days) blood. RBC transfusions vary in volume from 5 to 20 mL/kg though 20 ml/kg transfusions have been tolerated well and decrease transfusion events.

Blood exchange transfusions (BET) are commonly required for hyperbilirubinemia in neonates because of delayed diagnosis and ineffective phototherapy. However, the situation is rapidly changing with the availability of low cost LED phototherapy devices. Few preventable indications like Rh isoimmunisation however, continue to persist. BET carries the risks of blood exposure and the procedure itself. Most blood banks may not be able to mix appropriate group RBCs with AB negative plasma in a closed system.

In India, 69% of donated blood is still used as whole blood and facilities for component separation are not universal. Even when component separation is available, their use is often not evidence–based. Thrombocytopenia affects one-fourth of neonates admitted to NICU, and platelet transfusions are commonly administered to prevent or control bleeding. However, there are few evidence-based guidelines to inform clinicians' decision-making. Similarly, up to 15% of neonates admitted to NICU are transfused with plasma with almost half being given for abnormal coagulation values with no evidence of bleeding. Both platelets and plasma are often transfused without even doing platelet count or coagulogram.

Acute reactions may occur in 1% to 2% of transfused patients. Due to lack of awareness and training, there is under-reporting of transfusion errors. Replacement donation is the mainstay of transfusion in India and transfusion transmitted infections are 2 to 3 times higher in replacement as compared to voluntary donations. Blood transfusion may account for 15% of HIV cases in developing countries. Among the estimated 120,000 new HIV infections in 2011-12, 1% were through transfusion of blood or blood products. Over the past decade, incidence of donor HIV sero-reactivity has declined from 1.2% to less than 0.2%. CMV can cause serious morbidity and mortality in neonates, especially preterm neonates born to CMV-seronegative mothers. If donors are CMV-seronegative and leucoreduction is used, the risk is extremely low. CMV seronegative or leucocyte reduced RBCs are recommended for infants <1200 g born to CMV seronegative mothers or those with unknown serostatus, and for intrauterine transfusions. In practice, however, the uptake of preventive measures for reduction of CMV transmission are grossly inadequate.

Universally appropriate, safe and cost-effective use of blood is the holy-grail that one aims for. Community awareness, education and training of physicians and nurses, evidence based guidelines and standard operating procedures, and continuous monitoring are required to address this challenge.

Dora Mbanya
Head of Department of Haematology, University of Yaounde, Cameroon

Annick Mintya Ndoumba
Centre Hospitalier Universitaire, Cameroon

Paediatric Transfusion in the Yaounde University Teaching Hospital, Cameroon: characteristics and challenges

Haematology and Transfusion Service, University Teaching Hospital, Yaoundé, Cameroon

According to the World Health Organisation, anaemia affects about 68% of preschool children, 57% of pregnant women, and 48% of non-pregnant women in Africa (1). Sub Saharan Africa (SSA) is plagued with high prevalence of malaria and other infectious diseases like the human immunodeficiency virus (HIV) and hepatitis B and C which contribute significantly to anaemia in these settings. In Cameroon a few reports indicate that malaria accounts for very severe anaemia in children aged below five years (2,3). Malnutrition, sickle cell anaemia and hookworm infections also contribute to anaemia especially in children in SSA.

Thus, children tend to require transfusions very often. Indeed, in an early report on blood indications and uses of blood in Yaoundé, Cameroon, Mbanya et al (4) reported 54% of all blood transfusions occurred in the paediatric Service. However, because hospital-based blood banks dominate in Cameroon, transfusion practices vary, and there is very inconsistent availability of blood and blood products in each setting, hence deaths are recorded from lack of blood.

A recent analysis of paediatric transfusions in 175 children at the Yaoundé University Teaching Hospital (YUTH) showed a mean age of 3.75 years (range 1 day - 15 years), and a male predominance (60%). About 54% of the blood recipients were Blood group O, while 22%, 20% and 4% were groups A, B and AB, respectively. None was Rhesus negative. Whole blood was transfused to about 75% of these children, and the rest received red cell concentrates. There were curiously no platelet transfusions noted. As seen in Table 1, most of the paediatric transfusions were related to underlying disorders including homozygous, sickle cell sufferers, HIV infection and haemophilia. The main indication for transfusion was anaemia related to various clinical conditions including malaria, vaso-occlusive crises, meningitis, neonatal infections and injuries.

Anaemia associated with malaria was the prevalent indication for blood transfusion in this analysis, which is consistent with the previous findings of Mbanya et al (2) who reported a markedly significant presence of Plasmodium falciparum parasites in children with severe anaemia aged 6 to 60 months old. Additionally about 57–80% children with sickle cell anaemia required transfusions (5,6). HIV infected children also received frequent transfusions because the virus directly infects marrow stem cells and promotes apoptosis. In our analysis, whole blood was the major blood product used. Indeed, in Sub-Saharan Africa, whole blood is now recognized by the World Health Organisation as an essential drug despite other associated risks like circulatory overload. Whole blood is effective in exchange transfusions and in patients who require red cell transfusions when red cell concentrates are not available.

There are several indications for blood transfusion in children in our settings, but many challenges hamper the processes including low blood supply, limited availability of logistics for providing appropriate components, human resources challenges and the lack of screening for highly prevalent infectious diseases. Nevertheless, the onus remains on healthcare providers to appropriately assist sick children in these resource-limited settings.

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6. B Otaigbe: Prevalence of blood transfusion in sickle cell anaemia patients in South-South Nigeria: a two-year experience. IJBMR 2013; 1:13–18.

Underlying pathologies	**% (n=175)**	**Indications for blood transfusion**	**% (n=175)**
Sickle Cell Anaemia	45	Severe malaria	38
HIV infection	26	Sepsis	16
Haemophilia	19	Clinical anaemia	10
Cardipathy	7	Neonatal infections	5
Viral hepatitis (B and C)	3	Meningitis	4
		Kidney failure	3.5
		Vaso-occlusive crisis	3.5
		Neoplasm	3.5
		Trauma	3.5
		Others	13

Table 1: Findings in transfused children

Ravi Reddy

The first few months of 2017 have been quite busy for ISBT Central Office and the Board of Directors. The Board met for 2 days in early February with the main objective being to review the current 2015 – 2018 strategy. We are pleased that excellent progress is being made in implementation of the objectives particularly with regards to advancing knowledge and international outreach. Small sub groups of the Board have been busy working on proposals to increase access to ISBT educational and congress related material and this will be a focus for 2017. Central Office has also been very active and has introduced the ISBT Community forum as well as webinars and I encourage members to actively participate in these initiatives and to provide feedback to the staff.

The Standing Committee on Ethics were tasked with reviewing the ISBT Code of Ethics and to recommend amendments where relevant to reflect the changing nature of transfusion medicine. After much work the committee, currently chaired by Dr Peter Flanagan, have submitted a final draft of the revised code to the Board. This has been reviewed and endorsed by the Board and the next step will be to seek member input and comments which the committee will consider prior to the Board taking the document to the General Assembly for approval.

Strategic partnerships and collaboration with other organisations and societies is an integral part of ISBT's international focus and in the past few months management and Board members represented ISBT at a number of workshops and meetings. These included the Asia Pacific Economic Community (APEC) meeting in Vietnam, The Chinese Society for Blood Transfusion (CSBT) congress in China, the ABHH meeting in Brazil and the WHO Expert Committee on Biological Standardisation (ECBS) meeting in Switzerland. Additional human resources are planned for central office to engage even further with our stakeholders. The ISBT Academy has also provided support to a number of meetings organized by Regional and National Societies. Members are encouraged to apply to the ISBT Academy for support to have ISBT academy sessions or joint meetings at their local congresses.

The focus section of Transfusion Today has been well received by members and I would like to thank the working parties for their significant contribution in this regard. This edition focuses on neonatal and paediatric transfusion, a discipline of transfusion medicine that is fraught with challenges especially with demand from physicians for adequate products, and challenges faced by Blood Services in providing a suitable range of small volume products.

Ravi Reddy

Welcome to our new members

(December 2016 - March 2017)

Africa

- **NIGERIA:** Idris Saliu
- **SOUTH AFRICA:** Wendy Sykes
- **KENYA:** Nyarambe Wigina

Americas

- **UNITED STATES:** Yanyun Wu, Kerri Weinert, Nareg Roubinian, Samuel Rose, Jeanne Hendrickson
- **CANADA:** Clare O'Reilly, Nicole Sabourin

Eastern Mediterranean

- **EGYPT:** Fateh Moftah

Western Pacific

- **CHINA:** Li wong
- **SINGAPORE:** Nadine Verdoorn, Mohan Ravuru
- **AUSTRALIA:** Azhar Munas, Graham Murdoch, David Roxby, Carmen Walter

South East Asia

- **INDIA:** Rajendra Chaudhary, Nidhi Sharma, Anisha Navkudkar, Abhaykumar Gupta
- **SRI LANKA:** Samatha Kumarage
- **PAKISTAN:** Hafiz Irfan Shabber
- **MYANMAR:** Thantzin Min

Europe

- **UNITED KINGDOM:** Helen New
- **BOSNIA AND HERZEGOVINA:** Jasminka Kurilic
- **GREECE:** Magdalini Pape, Eftychia Kontekaki
- **RUSSIA:** Elena Kudinova
- **BELGIUM:** Saadia Larsi, Ann Hendrickx

Membership renewal

We are very happy to invite you to renew your ISBT membership for the new membership year 2017-2018 (April 1, 2017 to March 31, 2018). Continuing your ISBT membership will give you the opportunity to connect and participate in our growing transfusion medicine community.

Member Benefits:
- Access to the ISBT Academy ePortal (including congress webcasts and presentations)
- Subscription for Vox Sanguinis (paper + online)*
- Receipt of Transfusion Today (paper + online)*
- Receipt of the monthly E-news
- Attend ISBT Webinars
- Join the ISBT Community Forum
- Registration discount at ISBT congresses
- Online access to Working Party material

* Online access only for 35 years and under fee

How to renew
1. Login with your current email address and password.
2. Click on 'My Membership & Payments' to pay your membership fee for 2017/2018.

! To ensure you will benefit from the extra's as mentioned above, it is important that you complete your membership payment for 2017/2018.

Fees
ISBT Membership fees are based on your age and your country. Read more about fees on our website.

35 years and under?
People of 35 years and under can pay a discounted fee of €55 per year. Please read more on this discounted membership on our website.

Payment methods
Online payments can be made using the following methods:

1. Recurring direct debit*
2. Credit card (no 3D-secure)
3. PayPal
4. IDEAL (Netherlands only)

* Recurring direct debit is available to members resident in most European countries. By using direct debit you authorize ISBT to collect the payment of your annual ISBT membership fee at the start of every new membership year. This saves you renewing your membership every year so we highly recommend it!

If you do not have a credit card or PayPal account you can email membership@isbtweb.org to arrange for a bank transfer

Invoice
An invoice is available after logging in on the ISBT website under 'Payments'.

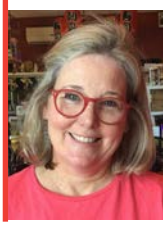
Membership card
After completing your payment, your membership card will be available for download (in PDF-format) on your personal profile on our website from April onwards.

Address up-to-date?
To ensure that you continue to receive Vox Sanguinis, Transfusion Today, and the monthly E-news please check that your membership details e.g. postal and email addresses are up-to-date and complete. You can edit your details by logging in and by going to Edit Profile. Make sure you click on "Update profile" on the bottom of the page to save your changes.

Questions?
Most of the answers you can find in our Frequently Asked Questions on the ISBT website. If you have any other questions, please let us know.

We are looking forward to welcoming you in the new membership year!

Team ISBT



Philippa Hetzel

In Memory of Robert (Bob) Beal

"An avuncular man, a polymath, highly respected and very knowledgeable, a mentor and friend, a great story teller"

- these are the words chosen by colleagues to describe Bob Beal. He was liked and respected by so many people here in Australia, and internationally. His life was full and productive, his service and achievements, significant and many.

Robert William Beal AM died at the age of 82 on November 20th after a short illness.

Educated at Newcastle Boys' High School, he graduated in medicine from Sydney University and gained fellowships in the Royal Australian College of Physicians, Royal Australian College of Pathologists, Royal Australian College of Medical Administrators, the Australian Institute of Management and the Australian Medical Association and was a Clinical Professor of Medicine at Flinders University and was still teaching until shortly before his death.

Bob commenced as the Director of the Australian Red Cross Blood Transfusion Service in South Australia in 1964 at the age of 29 as the youngest director ever appointed. He continued in that role for 32 years, and during that time, both blood transfusion and clinical medicine underwent significant change and transformation. Bob was passionate about the safety of the blood supply - locally, nationally and internationally. He was President of the Australian Society of Blood Transfusion 1978-80 and the International Society of Blood Transfusion 1998-2000 and was Head of the International Federation of Red Cross & Red Crescent Society Blood Program in Geneva in 1990-92 and again in 1996-97, also working with WHO. In these leadership roles, he influenced and guided the safety of blood programs globally.

Bob had enormous energy and was a champion for 'proper process'. Serving on many representative committees throughout his career, he valued committee meeting minutes and the issuing of formal memoranda as important means of communication! These methods may have originated in his Army experience being an Honorary Colonel in the Royal Australian Army Medical Core until 2004. However, they served an important function in a time when most of the critical blood component manufacturing steps were manual (including hand writing) and any transposition or error could result in patient harm, possibly death. His leadership, along with Judith Hay, created a culture where the managers and staff truly understood 'why' they needed to do everything and passionately cared about what they did taking enormous pride in motivating donors to return and in delivering the blood supply for patients. And of course, this rigor and discipline maintained the safety and sustainability of the blood supply.

While Bob was a stickler for the rules, he was also very kind, taking a genuine and personal interest in other people. He had a remarkable memory for detail and was a wonderful raconteur. He had a series of favourite one liners that he would quote liberally and repeatedly to invariably teach a moral lesson. A favourite was: "Blood Transfusion is like marriage: it should not be entered upon lightly, unadvisedly or wantonly or more often than is absolutely necessary."

Bob himself had a natural interest and curiosity to understand: to learn and to share his knowledge. He was always an active participant in whatever he undertook. It was his initiative and passion to start the first ARC International Humanitarian Law Committee, in South Australia. His interest and support of that particular cause continuing until his death. He was an accomplished organist and choir master, a keen golfer and an avid reader. He is survived by his wife Sue, five children and ten grandchildren.

Bob will be fondly remembered and greatly missed.

In only three months the 27th Regional Congress will take place in Copenhagen, Denmark. Get to know about all activities that will be organised during these four days alongside the scientific sessions and the social programme. Two workshops will be organised to inform early-career researchers or those wishing to brush up their knowledge on how to write a scientific article or peer review a submitted publication. Both workshops do not require pre-registration. Also, Transfusion Practitioners are invited to join two special sessions on Monday afternoon. These sessions will discuss the role of the TP, and invite attendees to connect and share knowledge.

Workshops

The workshop on peer reviewing will take place on Monday June 19 from 8.30 – 10.00. Dana V. Devine and Pieter van der Meer, editors of Vox Sanguinis and the ISBT Science Series, respectively, will host the session. The workshop is organised for early-career scientists who would like to offer themselves as peer reviewers and find out how to navigate the process. After completing this workshop you will also get the opportunity to become a future reviewer for congress abstracts and also for the two ISBT journals Vox Sanguinis and The Science Series.
The second workshop will be given on scientific writing. This workshop will take on a lecture format and therefore participants do not need to submit an abstract or register in advance. The workshop will take place on Monday June 19 from 14.00 - 15.30. More information on the date and time of this workshop will be published on the congress website in due time.

Transfusion Practitioners Session

On Monday afternoon Transfusion Practitioners are invited to join the special sessions organised by the TP-steering committee. First, a more scientific approach to the role of the TP will be discussed, focusing on implementing the role of the TP, and what influences a TP-role can have. The second session will be more informal, with an afternoon tea where participants can discuss and network. A questions and answers-session will be organised to discuss tips and tools.

Young Investigator Breakfast Session

The breakfast has been rescheduled to Tuesday morning June 20 from 07.00 - 08.15 in the Treehouse restaurant at Bella Center. Visit the congress website for more information on registration.

Key dates

- Deadline for Abstract Submission: March 9, 2017
- Deadline Harold Gunson Fellowship application: March 9, 2017
- Information on Abstract Allocation: April, 2017
- Deadline Early Registration Fee: May 4, 2017
- Deadline Late Registration Fee: June 8, 2017
- Onsite fee applies after June 9, 2017

More information about the congress and the programme can be found on the ISBT forum, **forum.isbtweb.org**, or the congress website **isbtweb.org/Copenhagen**

Pieter van der Meer
Editor, ISBT Science Series

Why you should read the ISBT Science Series!

The ISBT aims to advance knowledge of transfusion practice in the broadest sense. For that reason, they publish two scientific journals, Vox Sanguinis and the ISBT Science Series. The latter was founded in 2006, and mostly contained review papers by invited speakers at an ISBT congress. Two years ago, the journal was re-launched to also include original scientific papers. An editorial board was established, consisting of Anne Eder, Denese Marks, and Pieter van der Meer, who were tasked with transforming the journal to a peer-reviewed, pubmed-indexed journal. The ISBT Science Series complements the work published in Vox Sanguinis: we aim to publish manuscripts that have a regional focus which make it less suitable for publication in a general transfusion journal, while such a paper can contain information that is very relevant for that particular region. Further, we consider manuscripts that discuss a very confined subject, for the same reason that such a paper is less suitable for a general transfusion journal. In addition to original scientific papers, we also consider reviews and short communications (letters). Importantly, all ISBT working party reports will be included in the ISBT Science Series. One such report was from the Working Party on red cell immunogenetics and terminology, who published their update on blood group nomenclature in the August 2016 issue [1].

In order to assure the quality of the publications, both original papers and congress reviews are peer-reviewed, meaning that they are anonymously judged and commented on by expert colleagues in the field. In keeping with modern times, the journal is online-only. Access to the journal is included in your ISBT membership, and all articles can easily be downloaded and saved for future reference. As yet, the journal is not pubmed-indexed, but an application will be done in 2017. Currently, three regular issues per year are published, along with one or more supplements, depending on the number of ISBT congresses.

At these ISBT congresses, state of the art information is provided by experts on the subject. By publishing congress reviews, we want to relay this timely information to the readers as quickly as possible, and to speed up this process, congress reviews can now be accessed through EarlyView on the journal's home page, so the reviews are accessible as soon as they come from the publisher.
The most recent congress issue is that of the Dubai meeting. It is packed with interesting papers, including reports on Zika virus from Brazil (Levi) and French Polynesia (Musso), insights in the role of hemopexin (Smith), big data in transfusion medicine (by Jean Julliard prize winner Edgren), ways to produce platelet lysates (Burnouf), to name just a few of the various subjects discussed at that meeting. It is well worth checking out this issue, as there are no doubt a couple of papers of interest to you!

Lastly, I encourage you to subscribe to the email service that sends out a message whenever new papers are published online. You can do this at the journal home page (Get New Content Alerts).

Happy reading!

1. Storry JR, Castilho L, Chen Q, et al: International society of blood transfusion working party on red cell immunogenetics and terminology: report of the Seoul and London meetings. ISBT Sci Ser 2016;11:118-122.

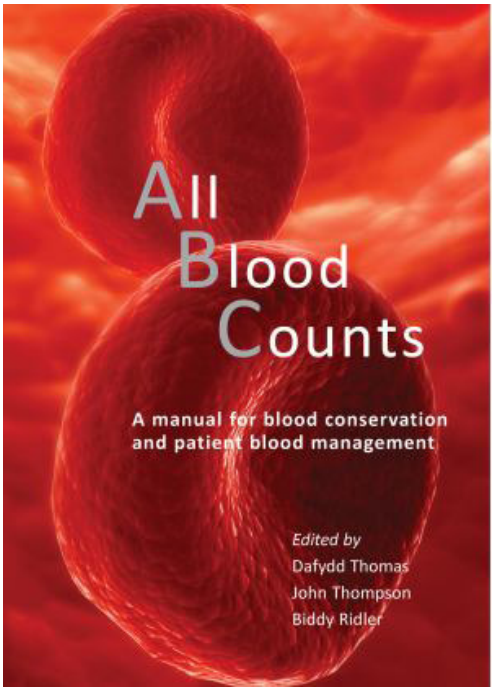
Cynthia So-Osman
Consultant Haematologist
and Transfusion Medicine
Sanquin Blood Bank Leiden, and
Groene Hart Hospital, Gouda,
The Netherlands

A manual for blood conservation and patient blood management.

Review by: Cynthia So-Osman

Edited by: Dafydd Thomas, John Thompson, Biddy Ridler. 2016.

This Manual is a practical and easy to read book that has been updated from its 2004 version. Since then, the concept of Patient Blood Management (PBM) has been adopted in the world of Transfusion Medicine. Nowadays, Patient Blood Management plays a central role in the management of blood conservation by putting the patient at the heart of decision making. In this manual, the principles and practical issues of PBM are discussed by well-known and leading authors in the field. If you are interested in PBM or involved in this topic as a health care professionals, this book will provide a nice overview of everything involving blood conservation and patient blood management. It is easy to read due to the clear layout: every chapter has the same format, starting with some quotes regarding the chapter's topic, flow diagrams are placed for practical use and every chapter ends with a checklist summary. Topics include how to handle blood management in the perioperative setting (Chapters 13 to 18), but also how to handle patients with massive blood loss (Chapter 22), postpartum haemorrhage (Chapter 25) and acute gastrointestinal bleeding (Chapter 27). Several techniques on transfusion alternatives such as blood salvage and point of care testing are discussed. Also several chapters on haemostasis can be found. A lot of recommendations were included, however, not all are supported by the recent guidelines. One chapter is dedicated to the NICE guidelines (Chapter 7), and its role in guiding recommendations. In November 2015, NICE published NG24 "Blood transfusion - assessment and management of blood transfusion" with the key points summarized in this chapter. However, it is still a big challenge to adopt these guidelines in daily practice. Fortunately, nothing could be found on the use of erythropoietin in the preoperative setting, which is a too expensive transfusion alternative with other cheaper alternatives in place, starting with a restrictive transfusion trigger (Chapter 20) as a basic and cheap PBM measure for the large majority of the patients. In the surgical setting, one should start with prehabilitation (Chapter 13) of the patient, and the surgical team and anesthesiologist should be well aware of PBM, tranexamic acid should be offered when relevant in terms of cost-effectiveness, all used for the benefit of the patient in order to optimise the patient's outcome.



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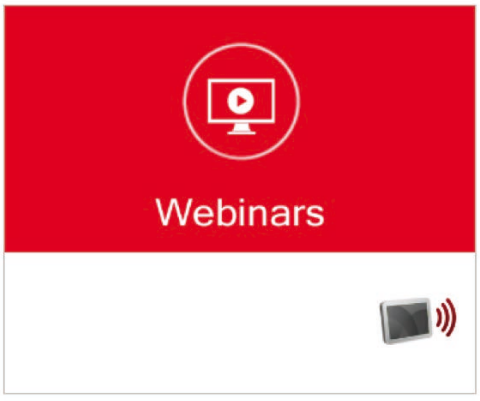
EDUCATION

Webinars

The new year began with a great new feature as ISBT launched its online webinars. The very first webinar took place on January 25 and was given by Jill Storry who introduced the basics of Blood Group Antigen Terminology. After a successful first event Masja de Haas gave a second webinar on March 1 about Haemolytic disease of the fetus and newborn.
The next webinar will be given by Nicole Thornton on 5 April which will be followed by many more interesting talks from various speakers covering a broad range of topics within Transfusion Medicine. The webinars are organized once a month and are available for ISBT members only. The webinars are recorded and uploaded to the featured content page of the Academy ePortal.



Forum

December 2016 we were happy to announce the start of the ISBT Community Forum. The forum is an online communication platform accessible to all members of ISBT to share knowledge, network, ask questions and give answers. All members of ISBT have received emails containing more information on how to access the forum and personal account details.

The forum is structured, meaning there are different sub-forums where specific topics can be discussed. For example, ISBT Working Parties have their own forum where you can ask questions and interact with Working Party members. If you are a member of a Working Party you can also join the specific sub-forum reserved for Working Party Members. If you would like to access one of the sub-forums, please contact your Working Party Chair to receive the password.

If you were already a member of the Young Investigator forum or the Transfusion Practitioner forum on LinkedIn you can find the password to the sub-forums on the new forum on the old LinkedIn page, or send an email to wingerden@isbtweb.org.

Check the forum regularly to make sure you do not miss the latest updates and developments! Feel free to ask any question on blood transfusion, transfusion medicine, ISBT or congresses on the forum. The ISBT Community is waiting to help you.

We are looking forward to meet you on the forum!

Scientific Secretary

ISBT is seeking a successor to Professor Ellen van der Schoot, the current ISBT Scientific Secretary. Ellen's term will finish at the 35th International congress of the ISBT in Toronto 2018. It is the intention of ISBT that there should be a transition period from the date of the appointment until the completion of Ellen's term. The Scientific Secretary is appointed by the ISBT Board of Directors. The post is non-remunerated.

The Scientific Secretary constructs the scientific programmes for ISBT regional and international congresses in collaboration with the local congress organising committee and a small scientific committee which he or she will establish. The Scientific Secretary also acts as chairperson for the scientific review meeting. More information can be found in an email that was send out recently to all members of ISBT.

Expressions of interest are sought from professionals who have an excellent international reputation in the field of transfusion medicine and who have a broad knowledge of the field enabling the development of wide ranging and innovative scientific programmes of a consistently high standard.

If you are interested in the position please email your c.v. and a covering letter of maximum two pages of A4 outlining the reasons for your interest and the skills you think you will bring to the role to chapman@isbtweb.org

The closing date for applications is March 31, 2017.

ISBT ACADEMY

Dimas Tadeu Covas
ABHH President

ISBT at the 1st Highlights of ISBT in Brazil

The Brazilian Association of Hematology, Hemotherapy and Cell Therapy (ABHH) thanks the ISBT Academy for its support of the 1st Highlights of ISBT held in Florianópolis on November 8th, 2016. The event provided South Americans with the highlights of the ISBT international congress in Dubai. ABHH joined Brazilian governmental, transfusion professional, blood establishment and industry partners in supporting the event, which welcomed 150 people from Brazil.

The program covered the DARC side of reticulocytes, Patient Blood Management, Hemovigilance, In vitro cultured red cells for transfusion, Arboviruses Transmissible by Transfusion (including DENV replication in platelets), Arbovirus epidemics in Brazil (Zika, Dengue, and Chikungunya), 2 obstetric RCT's on iron treatment and Leukocyte Antigens.

Dr. Dimas Tadeu Covas (ABHH President), Dr. Celso Bianco (ISBT Past President) and Dr. Dante Langhi Jr. (ABHH director) were on the Scientific Committee. ABHH is thankful to all participants, speakers, and supporting organizations who made the event such a success. ISBT Academy funding enabled for two international speakers to attend: Dr. Emile Van Den Akker from Holand and Dr. Astrid Norgaard from Denmark and Simultaneous Translation (English / Portuguese / English).

Dr Celso Bianco Past President of ISBT

Dr Astrid Norgaard, Speaker

ISBT ACADEMY

Sergey Sidorov
Executive Director
Russian Transfusionist Association

New trends in blood banking and clinical transfusion medicine

On December 14-16th 2016 the Russian Transfusionist Association held their 21st conference "Standards and individual approaches in clinical transfusion medicine" in the National Pirogov Medical & Surgical Center. The event was attended by over 150 specialists from Russia, Armenia, Belarus, Kazakhstan, Ukraine, Germany, The Netherlands and the USA.

The logistics of blood components in the distant northern areas can be challenging. The North-Russian Arkhangelsk region is larger than France or Spain and most of it is located above the Arctic Circle. Ivan Savin talked about saving resources by returning non-used red blood cells (RBC) units to regional blood banks and their branches or by using Alanine-aminotransferase (ALT) testing on the donors before donation.

Implementation of target-oriented and evidence-based guidelines for platelet transfusions lead to a decreased demand for these cells. Similarly, evidence-based guidelines for plasma transfusion are implemented in the Irkutsk region and due to these guidelines requests for plasma have decreased 50% in four years.

The regional blood bank in Ufa released data about equal clinical effectiveness of the pathogen inactivation of apheresis and pooled platelets by a combined photochemical treatment with amotosalen and UV irradiation. Due to the economical and quality improvements of new presses, and the implementation of top-and-bottom blood bags pooled platelets regained the interest of the blood bankers.

Daratumumab (anti-CD38) is a drug used to treat a multiple myeloma (MM). Patients suffering from MM do require blood transfusions, however as CD38 is expressed on various cells including red blood cells, Daratumumab interferes with antibody screening and therefore accurate blood compatibility testing of these patients remains a challenge. Erwin Scharberg, who was invited as the ISBT Academy speaker, gave a lecture on finding compatible blood for autoimmune hemolytic anemia patients with warm autoantibodies. Different adsorption techniques are available to eliminate these warm autoantibodies, which allow to detect the primary alloantibodies that underlie the disease. The audience was very interested to hear about the limitations of autologous adsorption including the use of recent transfusions, often not enough red cells, limited binding capacity and the need for a 1:2 dilution at every absorption step. Molecular DNA typing of blood group alleles is routinely used in Erwin's lab. Genotypes predict the phenotype of red cell antigens when serological testing is not possible because of reagent limitations or in pretransfused patients.

Erwin and other foreign guests participated in two (pre- and post-conference) round-table discussions and visited a hospital transfusion laboratory to share their practical experience.

To conclude the conference, professor Eugene Zhiburt informed the audience about new e-learning courses:

- Transfusion for clinicians,
- Clinical immunohaematology,
- Transfusion for nurses,
- Patient blood management.

Next conference in Moscow will be held on 14th of December, 2017. All colleagues are welcome.

Raj Nath Makroo
President, Indian Society
of Transfusion Medicine

ISBT ACADEMY

The 5th National Conference of the Indian Society of Transfusion Medicine (ISTM, TRANSMEDCON 2016) was organized at Bhopal, Madhya Pradesh, India, November 17-20, 2016

Five pre-conference workshops were held on the topics of advanced immunohematology, recent advances in Transfusion Medicine, research methodology in Transfusion Medicine, good patient blood management and transplant immunology. Lecturers, live demonstrations and hands on experience, where ever possible were included in the pre-conference workshop program. About 400 delegates attended the 5th Annual ISTM congress themed on "Safe Blood – Making every drop count for healthy India". There were 61 eminent speakers who were invited to cover a wide range of topics in transfusion medicine. The scientific sessions were organized into donor and therapeutic apheresis, immunohematology, platelet storage, nucleic acid testing for enhancing blood safety, leucodepletion, evidence based blood management, cellular therapies, transplantation/immunogenetics, dilemmas in transfusion medicine, public health and plasma products, newer developments and clinical hemotherapy. A talk on government initiatives in transfusion medicine was also included in the scientific program. Four panel discussions were held which included the impact of quality systems on transfusion medicine, research avenues in transfusion medicine, transfusion medicine education – backbone of safe blood program and dealing with genetic blood disorders, which was followed by an exciting and stimulating discussion between the panelists and the audience. A total of 187 scientific abstracts were submitted, of which 46 and 141 were accepted for oral and poster presentations, respectively. In addition to this, the young researchers were given a platform to showcase their research work. Twenty nine stalls were put up in the scientific exhibition.

The association between ISTM and ISBT continued for the fifth consecutive year and a plenary session on "Pathogen Reduction and Blood Safety" was organized by the support of the ISBT Academy on the second day of the conference. Professor Jean-Pierre Allain, from University of Cambridge, United Kingdom discussed about the "Role of Pathogen Reduction Technology in Transfusion Medicine - Safety and Efficacy", which was followed by a talk on "Pathogen Reduction Systems for Platelet Concentrates the Indian Experience" by Dr (Professor) Kabita Chatterjee, Head of Department of Transfusion Medicine, All India Institute of Medical Sciences, New Delhi, India. Both the presentations aroused tremendous interest among the delegates, followed by exciting discussion and comments. Dr (Professor) Neelam Marwaha, President ISTM invited the newly appointed executive committee comprising of the ISTM President, Dr (Professor) RN Makroo; Dr Tulika Chandra, the Vice President; Dr Manisha Shrivastava, the Secretory; Dr Aseem Tiwari, the Joint Secretory and Dr Prashant Aggarwal, the Treasurer on the dais and welcomed them.

Postgraduate students participated in the ISTM quiz on day one and two of the conference and the first three winning teams were awarded prizes and certificates in the valedictory function held on day three of the conference. A magnificent cultural extravaganza of Indian classical and contemporary music was organized, which was followed by a grand conference banquet.

ISBT ACADEMY

Hasan Abbas Zaheer
President
Pakistan Society for Blood Transfusion

Training Workshop on Immunohaematology

The Pakistan Society for Blood Transfusion in collaboration with the International Society of Blood Transfusion (ISBT) organized a 2-day training workshop on 'Immunohaematology' in Islamabad, Pakistan on December 9-10, 2016. The workshop was attended by the staff of the licensed public and private blood banks of Islamabad which included medical technologists, blood transfusion officers and postgraduate residents. Mr. Usman Waheed, General Secretary, PSBT presented the workshop objectives and the licensing status of the Islamabad blood banks.

The technical session included lectures on Introduction to Immunology (Dr. Muhammad Umair), Antigen-Antibody Reactions (Dr. Arshad Malik), ABO Blood Group System Genetics and Biochemistry (Dr. Ahmed Farooq), Rh Blood Group System Genetics (Mr. Akhlaaq Wazeer), Minor Blood Group Systems (Ms. Faiza Jabin), Antiglobulin Test (Mr. Asim Ansari), X-match with Gel Cards (Mr. Rehan Hafeez), and Screening and Identification of Allo-Antibodies (Mr. Usman Waheed). Following the presentations, practical hands on training session was conducted on the lecture topics, discrepancies of blood groups and troubleshooting procedures. Each participant was provided an opportunity to perform practical procedures.

Pre- and post-course assessment was done to have a systematic collection and analysis of information to improve participants' learning. Participants were given a questionnaire with 25 multiple-choice questions at the beginning and at the end of the training. Overall the knowledge after the post-course assessment was raised from 49.5% to 76%. The workshop was also evaluated before the concluding session through an Evaluation Questionnaire. The evaluation results indicated participant's appreciation of the workshop contents and the professional performance of the facilitators. Some useful suggestions were also received and will be used to further improve the capacity building programmes of the Society.

In his concluding remarks, President PSBT, Prof. Hasan Abbas Zaheer thanked the ISBT Academy for encouraging the national blood sector and supporting the organization of technical training workshops in Pakistan. He also thanked the workshop participants for their keen interest and the team of expert speakers for conducting the workshop in a professional manner. He said that capacity building of all cadres of professionals working in the transfusion sector is a key priority in the government's blood safety systems reforms being implemented by the Safe Blood Transfusion Programme.

ISBT Academy support for the Australian and New Zealand Society of Blood Transfusion meeting

Gemma Crighton
ANZSBT Council member
Royal Children's Hospital,
Melbourne, Australia

The Australian and New Zealand Society of Blood Transfusion (ANZSBT) kindly thanks the ISBT Academy for their support of our annual scientific meeting held in Melbourne from the 13th- 16th November 2016. The meeting was held as part of 'HAA 2016', alongside the combined annual scientific meetings of the: Haematology Society of Australian and New Zealand (HSANZ) and Australasian Society of Thrombosis and Haemostasis (ASTH). The meeting was a great success as evidenced by the delegate's evaluations, 85% of delegates completing the evaluation rated the meeting as a 4/5 or 5/5.

Key note international speakers in the ANZSBT program were Professor Steven Spitalnik from Columbia University New York, A/Prof. Sunny Dzik from Massachusetts General Hospital, Boston, Dr Naomi Luban from the Children's National Health System, Washington DC and Nicole Thornton from International Blood Group Reference Laboratory (IGBRL) in Bristol. Our speakers were excellent, giving inspiring presentations on a broad range of topics from RhD genotyping to investigate the patient with complex alloantibodies, paediatric patient blood management, red cell transfusions in Ugandan children and red cell storage. In addition, our international speakers delivered three master classes, which were very much enjoyed by the attendees.

The meeting included four combined sessions with the other societies on the topics of Haematological disorders of pregnancy, Haemoglobinopathies, Platelets and Red cells. In the final session, A/Prof Sunny Dzik finished with his beautiful presentation entitled "The air they breathe", leaving us with a timely reminder of how amazing and yet endangered our planet and ecosystem is.

The Ruth Sanger oration is the premier award of the ANZSBT, and this year it was delivered by the very worthy recipient A/Prof. Erica Wood; vice-president of ISBT, and a member of its working parties on clinical practice, haemovigilance, and transfusion-transmitted infectious diseases. Her talk entitled, "Karl Landsteiner was on to something," gave a nice overview of the history of haemovigilance, both internationally and locally.

An ISBT badged session was held entitled, "Resolving tricky laboratory cases". The session featured an excellent presentation from Nicole Thornton, IGRL, Bristol outlining the steps used by an immunohaematology reference laboratory to solve complex antibody cases. Kylie Rushford, Monash Health, Melbourne discussed the complexities of the patient with multiple antibodies and an approach to the "untransfusable patient". Danielle Oh, Monash Health presented a case of an alloimmunised beta thalassaemia major and highlighted the challenges of these chronic conditions, as well as dealing with a patient with multiple alloantibodies and hyperhaemolysis.

The ISBT Academy kindly provided monetary support to ANZSBT and this was used to fund three travel grants for delegates from developing countries from the South-East Asian and Pacific regions to attend the conference. The successful recipients this year were i) Mine Kojet, a medical laboratory technician in charge of the blood bank and haematology departments from the Marshall Islands, ii) Rosely Livae a medical scientist working in the central hospital blood bank in the Solomon Islands and iii) Sandra Semi, principal quality officer in TTM Hospital, Samoa. Reports from our three travel grant recipients will be available on the website of the ANZSBT.

Our travel grant awardees were offered hospital laboratory and Australian Red Cross Blood Service placements to complement the experiences of the conference. One of the recipients felt this was one of the most beneficial aspects of the trip to Melbourne. Feedback from the three recipients, were that the information and knowledge gained from attending the conference was excellent and very informative. The knowledge gained was very relevant to their fields of work and they aimed to take this knowledge back to their home countries.

We appreciate the ongoing support and partnership with the ISBT.

ISBT ACADEMY

Androulla Eleftheriou
Executive Director,
Thalassaemia International Federation

Report on the 2nd MEGMA Conference on Thalassaemia and other Haemoglobinopathies "Building on success"

The 2nd MEGMA Conference on Thalassaemia and other Haemoglobinopathies, was organised in collaboration with the Jordanian Thalassemia & Hemophilia Association and the Jordanian Ministry of Health, in Amman, Jordan between 11 – 12 November 2016, covering the Middle East (ME), Gulf (G), Maghreb (M) and African (A) Region. The conference was attended by approximately 300 participants (healthcare professionals, medical specialists, scientists, parents and patients) from 35 countries. The conference programme and abstract book are available at www.tifevents.org.

The scientific programme of the conference was drafted by the International Scientific Advisory Committee, led by Prof. Ali Taher. The Patients/ Parents Programme was compiled by the International Patients' & Parents' Advisory Committee comprised of expert patients from around the world. 36 Medical and Scientific experts from 18 countries of the Region constituted the faculty. Some of the 29 themes that were covered were: advocacy, best practices, cardiac complications, fundraising, haemovigilance, multidisciplinary care, osteoporosis, safety and quality of medicinal products, and working with doctors.

The East Mediterranean Region, is a high prevalence region for haemoglobin disorders. In a population of over 600 million, there is a mean carrier rate for beta thalassaemia of 4% (range 1.5%-8.8%) and for sickle haemoglobin 2.5% (range 0-11%). From these figures it is estimated that the expected annual affected births per 1000 live births of beta thalassaemia patients is 0.47 (range 0.05-1.9) while actual thalassaemia births are over 10,500 while those for sickle cell syndromes are almost 4,000. The total patient population of both diseases is estimated today to be 180,000, which may well be an underestimate considering the lack of national registries.

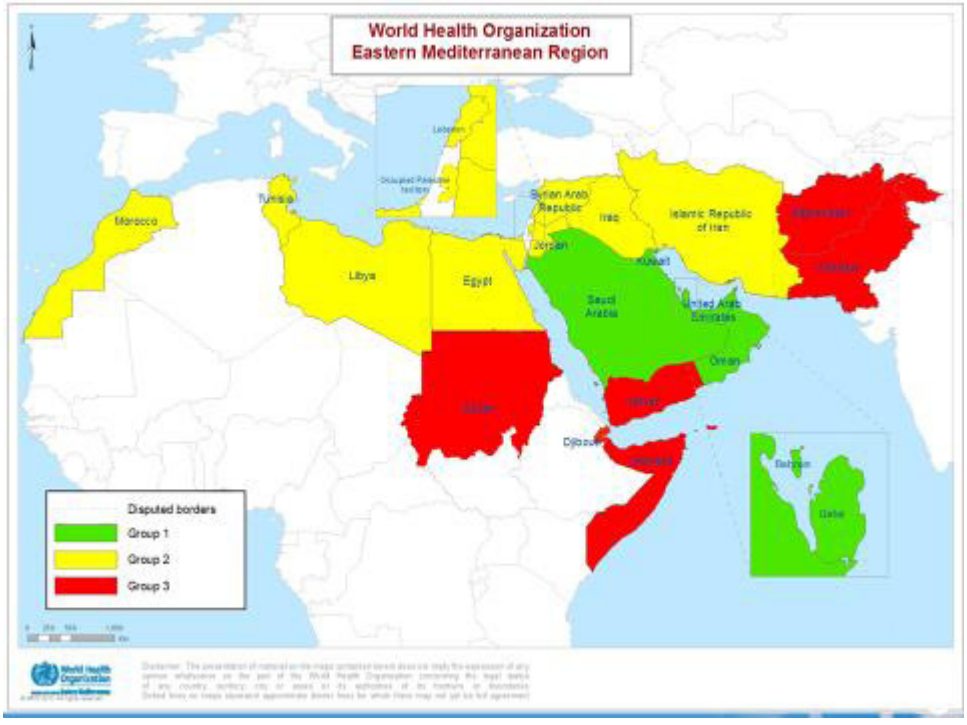
In the field of prevention 4 of the 21 countries have no programme at all, while 9 countries have partial or regional programmes. Based on a regional study, countries in the region have achieved not more than 60% prevention.

Concerning patient care, most countries have developed blood transfusion services and have made available all three iron chelating agents, albeit not in all cases fully reimbursed. Safety and adequacy of blood are still important challenges in some of these countries. In all countries improvements are necessary. TIF suggests several measures for improvement:

- Effective prevention strategies aiming to limit new affected births through nationally coordinated programmes, are necessary for success.
- Optimum care, including multidisciplinary care, as described in TIF's Guidelines has resulted in increased survival and improved quality of life of patients.
- Basic provisions are still difficult to provide in many settings. Examples include the inadequacy of blood supplies and concern about blood safety.
- New approaches for care and cure were discussed, since gene therapy and new drugs are in advanced human trials.
- Psychosocial issues are included in holistic and patient-centered care to benefit the social integration of patients. This includes the stigmatization felt by both families and patients.

- Adherence to treatment, including a new approach to iron chelation. The formulation of deferasirox is expected to increase adherence to iron chelation and to reduce side effects.
- The effects of migration. Recent migrations and the refugee problem mainly from the war torn regions has created major difficulties to patients suffering from haemoglobin disorders.

Services for haemoglobin disorders have evolved over the years in this region, and average age of patients with this disease have significantly increased, with very few exceptions. However, it is now necessary to build on successes and to fill in gaps, where they are identified. Governments need to recognize the need of holistic approaches to these diseases, which are highly prevalent in their communities. The Region has enough academic/scientific/medical human resource to provide advice to the national policy makers and both the WHO and TIF remain invaluable sources of expertise at their disposal. Long survival and good quality of life are the outcomes that all policies should aim for.



Ahmad Gharehbaghian
Shahid Beheshti University of Medical Sciences, Tehran, Iran

Efforts for Transfusion Competence in Iran

Pourfathollah A.A, Maghsudlu M, Karimi Gh, Hadipour Dehshal M., Tabriz-Namini M. Gharehbaghian A.

In spite of the fact that there is a need for a university transfusion medicine (TM) program to be developed, up to now, standardized curricula or university specializations in TM are not available in Iran. To fill this gap relevant courses given in blood establishments needed to be reviewed together with hospitals and clinics where blood components are administered to patients. It was discovered that the discipline of haematology and blood banking at MSc and PhD levels are offered both in medical universities and the Iranian Blood Transfusion Organisation (IBTO). The contents of these programs bear the closest resemblance to what an ideal TM course should be about. Moreover, as the fields of haematology and oncology often encounter TM issues it would be beneficial if IBTO could offer pathology residents and haematology subspecialists lectures and practices relevant to TM.

Educational courses on TM need to be tailored to the demand of all health care employees and patients related to blood transfusion and should include information about the most prevalent diseases in the country. This should be done irrespective of what sector is responsible for its formulation or development. Since all efforts of blood collection, and distribution and transfusion are managed solely by IBTO, it would be easier if IBTO would organize a nationally coordinated curriculum and would act as the reference for all related enquiries. Improvements in TM education would affect many who are involved in the chain of blood transfusion from individuals working in the blood banks to end-users and the implementation of new educational courses can therefore lead to motivated and competent staff, qualified health care workers including physicians and clinical residents, and well informed patients. Moreover, management of complex medical and surgical cases, particularly those with haemorrhage, cardiac surgery, liver transplant, treatment in the intensive care units, or in paediatric and geriatric wards would significantly improve by the implementation of TM courses. The establishment of this educational program needs to be a joint effort between hospitals, universities, professional groups, IBTO staff, and other relevant communities who can offer their views on how to develop the best education and training resources. Centralized communication channels for all education-training sources need to be facilitated in the country to ensure the required level of competencies for transfusion professionals so that all important issues are covered and training/educational/competency gaps can be filled.

In order to keep up with other, better developed blood systems in the world a standardized training policy needs to be implemented in Iran. The second step is to invite experts to assist with coordinating and implementing guidelines for transfusion practices. IBTO will attempt to address the educational issues and fill the gaps, but as mentioned before a well-integrated connection between IBTO and hospitals is essential for fruitful steps to be taken. IBTO works actively on assuring that everyone who is involved in blood transfusion gets informed about the new approaches and developments. The next step is to organize training modules that can be combined with regular assessments similar to the short-term training systems that IBTO has been successfully coordinating for years, where staff are supposed to study scientific references available on the IBTO website and then take evaluation exams. The final step will be to educate patients as well.

2017

April 20-21
Sanquin Spring Seminars 2017 on 'Iron Metabolism and Anemia'
Amsterdam, The Netherlands

May 16-17
IPFA/PEI 24th International Workshop
Zagreb, Croatia

May 16-17
9th International Meeting Stem Cell Network NRW
Münster, Germany

June 17-21
27th Regional Congress of the ISBT
Copenhagen, Denmark

November 25-28
28th Regional Congress of the ISBT
Guangzhou, People's Republic of China

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