

## World Blood Donor Day: The Challenges Ahead

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This year's World Blood Donor Day falls on the 14 June. The World Blood Donor Day commemorates Karl Landsteiner (14 June 1868–26 June 1943) who was the first person to have discovered the first blood group in 1900, the ABO blood group, and he was awarded the Nobel Prize for Physiology or Medicine in 1930. On World Blood Donor Day, we recognise the valued contribution and unmatched generosity that a blood donor makes to the community. The theme of the 2012 World Blood Donor Day campaign, "every blood donor is a hero" focuses on the idea that every one of us can become a hero by giving blood.

In this modern society, human beings are now using new and modern techniques and technologies to communicate with one another. The days of sending a handwritten letter to a loved one is becoming a rare occurrence. Sending letters is almost an obsolete method of personal communication. Instead, we are now in the era of internet communication, and conversing with each other through electronic means e.g. e-mails, e-greeting cards. The once personal touch of writing a letter is now rarely used as a mode of communication. Daily communication is now carried out quite often through SMSs rather than by verbal or visual communication. The usual process which we took for granted such as seeing the person, hearing the voice or receiving a physical touch, is becoming an uncommon practice in a person's daily life. Even when it comes to customer services, many of the processes are also heading towards a mechanical and impersonal way e.g. electronic check-ins, electronic helpdesks, electronic meal order services. The personalised customer service is slowly becoming a thing of the past.

With advancement in technology and scientific knowledge, one would think that the provision of blood can be made easier and may be possible to remove the "human touch" to saving lives. However, even after years of research and investigation, artificial blood is still not universally accepted or readily available in medical practices. We still continue to rely on human blood donors for our blood supply and we are dependent on voluntary commitment to maintain the blood donor pool. The "human touch" is still vitally important in the saving of our patients' life and nothing to date has come close to eradicating the need for human blood donors. Recruitment, motivation and retention of blood

donors are of vital importance in maintaining a sustainable donor pool for the care of our patients. As we reflect on this World Blood Donor Day, we should be celebrating and appreciating the commitment of our blood donors who are the unsung heroes of our community.

### Artificial Blood Substitutes and Where are We Now

The human blood is a very complex structure which makes its duplication a very difficult process. Artificially creating a blood substitute that has similar properties as human blood is extremely complicated and difficult to replicate.

The concept of manufacturing artificial blood comes from several reasons. This attractive idea comes from wanting to make a product which is of immediate and easy availability and has a long shelf life to allow for easy transportation to areas of needs (e.g. war zone areas). Hence, there is little reliance on voluntary and inconsistent supply of blood donors. Artificial blood should also be relatively risk-free of microbial contamination. Being a product of universal compatibility, it should be relatively safe and easy to use, not requiring cross matching and hence no risk of red cell incompatibility. Artificial blood should also have an effective oxygen-carrying capacity.

The first research into artificial blood began in the 1960s when Dr Leland Clark experimented with a class of compounds known as perfluorocarbons. There are currently 2 main types of artificial blood products that have undergone clinical trials and investigations. This includes (i) haemoglobin-based oxygen carrier; these are made from several sources of haemoglobin to form haemoglobin solutions. These sources may be from outdated red cell units. Types of modified haemoglobin include surface modified haemoglobin, cross-linked haemoglobin and polymerised haemoglobin. (ii) Perfluorocarbon oxygen carrier; these are synthetic hydrocarbons that have the capacity of dissolving up to 50 times more oxygen than plasma.

There are limitations to artificial blood substitutes. They are not only costly drugs but haemoglobin-based oxygen carriers have short shelf life. They last no more than 20 to 30 hours in the body as compared to whole blood which lasts for 35 days. Also, these blood substitutes do not

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mimic the blood's ability to fight diseases and they do not form blood clots. Consequently, the current application of artificial blood technology will be limited to short-term blood replacement. Perfluorocarbon oxygen carrier requires high concentrations of supplemental oxygen to function as the oxygen carrying capacity is linearly related to the pO<sub>2</sub>. At such high concentrations of oxygen, there could be toxic effects to the human body. There are other disadvantages and complications of artificial blood substitutes. These include vasoconstriction and vasopressor effect, increased haemostatic effect, gastrointestinal symptoms and myocardial injury, immunosuppressive and cytokine mediated effect, platelet sequestration causing hepatosplenomegaly, and interference with laboratory assays.

Despite these setbacks—the concerns about blood safety and availability, complexity of compatibility testing, and a need for products to treat haemorrhagic shock—will fuel the interest in this field and further research and clinical trials in artificial blood substitutes will continue. However, at this point in time, despite several decades of research, artificial blood substitutes can only supplement human blood but cannot replace the human blood supply. It is not a universal and versatile product and has not taken over the function of the human blood.

### **Objectives of World Blood Donor Day 2012**

The objectives of this year's World Blood Donor Day campaign are to (i) thank and reinforce the self-esteem of those who give blood so that they will continue to do so regularly; (ii) inspire those who are in good health but do not give blood to start donating blood; (iii) encourage blood service staff to recognise blood donors for their "heroic" act each time they donate blood; and (iv) persuade ministries of health to show their appreciation to the blood donors and provide adequate resources to move towards 100% voluntary unpaid blood donation.

### *Developing a Good Blood Donor Recruitment Programme*

In general, a minimum of only 2% of the general population need to come forward to donate blood to meet the demands of any developing country. The main strategies of any blood donor programmes are (i) donor motivation, (ii) donor recruitment and (iii) donor retention. This is to maintain a sustainable blood donor pool so that the blood supply can meet the demands of blood usage.

Although it is important to meet the blood demand, blood donor programmes should be aimed at maintaining blood safety. The general principles of blood safety include maintaining and retaining voluntary and non-remunerated blood donations, encouraging donor self-exclusion of high-

risk behaviour and developing effective donor selection policies and procedures. It is important to estimate blood requirements and provide effective education and motivation campaigns for donor recruitment as well as provide high standards of donor care with good maintenance of donor records.

(i) Donor Motivation: The main strategies to enhance donor motivation involve public awareness, information and education as well as public appeal and interest in blood donation. The personal aspiration of carrying out a heroic act and generating interest in organizational groups serves to encourage blood donation amongst the general public.

(ii) Donor Recruitment: The assessment of blood supply and demand helps in understanding donor recruitment strategies and maintaining an adequate blood donor pool. Knowing a country's total population, the number of hospital beds, medical facilities and the annual blood usage are important factors in planning donor recruitment strategies. The general principles of a donor recruitment programme are to highlight the importance of voluntary non-remunerated donations and to maintain continued motivation and education of potential donors. The involvement of famous personnels and community leaders in education programme, the retention of safe donors and the continuous organisation of donor recruitment campaigns can assist in maintaining an adequate blood donor pool. When planning education and motivation campaigns for blood donation drives, consideration should be given to the targeted audience, their demographics, their socioeconomic and cultural background, and their level of education. An effective donor recruitment programme requires good communication skills. This involves the use of simple and clear messages conveyed in a local language, and educational materials that are suitable for the target group to motivate potential donors. Policies and procedures should be put in place to ensure blood safety during blood donation. This is maintained by unpressurised and consented donation, a detailed donor questionnaire, donor information and counselling, assurance of absolute donor confidentiality, and safe and proper blood collection procedure.

(iii) Donor Retention: Donor retention is an essential strategy in any blood donor programme. It aids in maintaining a sustainable and safe blood donor pool. The strategies aimed at retaining blood donors involve having a long-term relationship with the donors. Provision of a clean and easily accessible location for blood donation, having a convenient time schedule and avoiding long waiting time can help in encouraging more donors to come forward. It is important that there is good staff behaviour and good training as well as experienced staff to provide proper donor care and to make blood donation a pleasant experience for the blood donor. Equally importantly is the appreciation of the

blood donor and assurance of donor confidentiality should be practiced. The provision of appropriate follow-up and medical support for the donor is essential in a good blood donor recruitment programme.

### Conclusion

Apart from an effective blood donor programme, it is also important to stress that blood conservation methods should be encouraged in order to reduce the strain placed on blood supply. Such methods may include the use of less blood units, lower transfusion triggers, use of haematinics and hormonal therapies, and medical and surgical conservation methods.

As we come to celebrate and commemorate this World Blood Donor Day, we should be aware of the sacrifices that blood donors make each time they donate blood. We should show our appreciation to our blood donors and be inspired by their heroic act. The encouragement of the general public to come forward as blood donors should be a daily affair. On this Day, we should all take a chance, make a choice to change a person's life by coming forward as blood donors.

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