Autumn 2011 • Issue 34

NHS Blood and Transplant

Blood and Transplant Matters

Information for hospitals served by NHS Blood and Transplant

Inside

NHSBT – The Challenge Ahead 4

Optimal Blood Use 5

Myalgic Encephalomyelitis and Donor Exclusion 7

Safe and Dignified: The Donation Chair 8

Update on variant CJD 10

Guidance for the Emergency Transfer of Blood with Patients Between Hospitals 11

SHOT Reporting and The Role of the Incidents Specialist 13

Common Inherited Disorders of Clotting: Part 2 15

An Audit of Use and Wastage in the North West of England and North Wales: Where Have all the Platelets Gone? 17

NHSBT Tissue Services Retrieval Team Training Review 2009 Onwards 20

Therapeutic Apheresis – Current Practices, Future Challenges and Opportunities 21

Pioneers in Stem Cell Transplantation – E Donnall Thomas 23

The Creation of a National Blood Service in Chile: Benefits of a Cooperation Agreement between NHS Blood and Transplant and The Chilean Health Ministry 24

CPD Questions 28

Diary Dates 30

EDITORIAL

Once again, it is a pleasure to introduce a new issue of *Blood and Transplant Matters*. As usual, we have endeavoured to include a range of articles across blood collection and usage, tissue services, stem cells and transplantation.

The drive for quality, efficiency and safety in healthcare creates many challenges for its providers. Part of the problem is that new teams are required to drive through the changes which are required and these inevitably cost money. Lynda Hamlyn, the Chief Executive of NHS Blood and Transplant, discusses how our organisation has responded to the requirement to drive down the cost of blood and reduce adverse events, for example of donation. She talks about the pressing clinical need to increase organ donation and how NHSBT is working closely with the Department of Health and the Anthony Nolan organisation as sponsor of the UK Stem Cell Forum to increase the provision of stem cell transplant programmes within the UK.

Randle Derbyshire and Jane Pearson describe the 'safe and dignified' donation chair that is being introduced on our blood collection sessions. This will help reduce the risk of fainting after donation and staff injuries whilst setting up the donation chairs. One look at the picture of the old-style flat bed, previously in use, will I am sure leave readers convinced that the new chair was much needed. It is, of course, important to select donors properly and Sue Barnes has written about Myalgic Encephalomyelitis and donor exclusion highlighting that our over-riding aim is to protect both the health of recipients of blood and the donors themselves.

The appropriate use of blood is clearly a priority and Ian Franklin addresses the optimal use of blood whilst articles on the emergency transfer of blood and platelet use and wastage in the North West of England discuss specific aspects of optimised blood usage. Adverse events associated with blood transfusion are reported to SHOT and a timely article by Julie Ball describes the role of the SHOT Incidents Specialists.

The media have been quiet on the subject of variant (v)CJD recently; however it has not been forgotten by blood services. In this edition, Pat Hewitt describes the current position with regards to infectivity and transmissibility, blood component processing, animal studies and donor screening. Although testing is not yet near to implementation, people born after 1st January 1996 are considered to be vCJD safe and could be used as panel donors for certain patients in younger age groups.

In the final section, Amanda Ranson describes enhanced training for NHSBT's Tissue Services Retrieval Teams and Khaled El-Ghariani and Catherine Howell explain what's going on in Therapeutic Apheresis, highlighting opportunities for development. In our 'pioneers series', it gave me great pleasure to summarise the illustrious career of Edwin Donnall Thomas, one of the greats in stem cell transplantation. Our overseas perspective has been provided by Patrick Sullivan and Steve Morgan who describe the creation of a National Blood Service in Chile and the role of NHSBT in this. Patrick Sullivan has now left the service and we wish him well in his retirement.

We have rescheduled publication issue dates to April, September and January to avoid Blood and Transplant Matters arriving on your desks (if you're lucky enough to have one) during the summer holidays or the hectic pre-Christmas period and therefore being overlooked. Incidentally, Mae West held that "it was better to be looked over than overlooked". We hope that you will follow her example and look over this issue thoroughly. As ever, I hope that you enjoy this edition of *Blood and Transplant Matters* as much as myself and colleagues on the Editorial Board have enjoyed putting it together for you. Finally, big thanks to Carol Griffin who does most of the hard work!

Happy Reading!

Derwood Pamphilon
Editor
Blood and Transplant Matters
NHSBT, Filton, Bristol
Email: derwood.pamphilon@nhsbt.nhs.uk

NHSBT – The Challenge Ahead

One of the best parts of being Chief Executive of NHS Blood and Transplant is hearing stories about how often our staff operate above and beyond the call of duty. I am also blessed in having so many opportunities to meet our loyal blood donors across England and North Wales and to hear at first hand some of the incredibly moving stories of those whose lives have been transformed as a result of an organ transplant. For their sake I am proud of our achievements and confident of the need to take ambitious steps forward in order to play our role in the wider NHS and, in particular, to continue to save and improve lives.

NHSBT is already an ambitious organisation. In early 2008 our three year Strategic Plan established a series of very challenging objectives, bringing together the outcomes of the first Organ Donation Taskforce (ODTF) report and the National Blood Service Strategic Review.

The plan included the opening of the world's largest blood centre in Bristol and the associated consolidation of some of our manufacturing activities, refurbishment of facilities and the introduction of new working practices to support greater efficiency across the blood supply chain. That programme has now been delivered, the objectives met and the benefits secured.

This, along with other changes in NHSBT, has enabled us to reduce the cost of blood from £140 in 2008/09 to just under £125 – a price we are committed to maintain until 2014, resulting in savings of nearly £30 million each year that can be passed on to frontline NHS patient services. We have achieved this while maintaining supply, safety and high regulatory standards; a great testament to the skills and professionalism of our staff.

At the same time, we have seen the benefits of investing in raising public awareness about organ donation and developing an infrastructure that lays the foundation to make organ donation a usual, rather than unusual, event in hospitals.

LOOKING FORWARD

Our aim is to deliver a modern, world class blood service. Changes will continue to be needed to make it more convenient to donate blood and platelets, reduce waiting times and improve the overall donation experience so that we can continue to rely on the loyalty of our donors.

The impact of our current modernisation programme will soon, I hope, be seen at sessions. A new donation chair has been developed (as shown in this issue of *Blood and Transplant Matters*) to provide a safer, more comfortable and more enjoyable donation experience and we will also be rolling our new Hb testing kits, blood agitators and giving more collection teams wireless access to IT, including electronic donor selection guidelines.

We have also made the management and reduction of adverse events experienced by donors, a much higher management priority - with a 62% reduction in the incidence of re-bleeds following donation and a reduction in faints from 384 to 174 per 10,000 donors – as our reward.

At the same time, we have continued to work with our customers to improve their service, maximise efficiency and ensure safety. The successful trial of a new Online Blood Ordering System will deliver further efficiencies and streamline ordering processes for hospitals, further improving our customer service.

We have also been working closely with the charity Anthony Nolan to explore how we might work together to deliver some of the recommendations made by the UK Stem Cell Strategic Forum last year. The focus of this work is our shared goal of helping ensure more patients can receive a lifesaving stem cell transplant faster whilst delivering savings to re-invest in expanding our cord blood bank.

ORGAN DONATION AND TRANSPLANTATION

A record high of 3,740 transplants were carried out in the UK in 2010/11. This was the 6th year on year growth in the number of transplants. The year also saw an increase of 7% in the number of deceased organ donors which reached a record level of over 1,000.

We have made huge improvements to the way we work in hospitals; nearly 250 specialist nurses in organ donation now work alongside the growing network of 185 clinical leads, promoting the overwhelming need for organs.

But there is more we must do if we are to save the three people a day who are currently dying due to lack of a suitable organ. I would encourage anyone reading this who is not on the Organ Donor Register to call 0300 123 23 23 to register and then tell their families they wish to donate.

THE FUTURE

We are proud of our achievements and look forward to the future with confidence. Despite the challenges of a new Government, the recent Arm's Length Bodies (ALB)

Review confirmed our unique contribution to the public health and confirmed our continued status as a Special Health Authority.

In 2011-14 we will continue to:

- maintain our focus on improving our service to hospital customers, donors and patients.
- accelerate the rate of organ donation across the UK.
- use our unique skills and capabilities in the fields of tissues, stem cells and diagnostic services so that we can save and improve the lives of many more very sick patients.

Our Strategic Plan for 2011-14 – which can be found at **www.nhsbt.nhs.uk** builds on our recent success and demonstrates just how ambitious we are as an organisation. The next three years will present many opportunities and challenges as we move forward with our overall goal to deliver excellence in the work we do - providing products and services that help save lives.

Lynda Hamlyn
Chief Executive
NHSBT
Email: lynda.hamlyn@nhsbt.nhs.uk

Optimal Blood Use

It might seem surprising that in the early years of the 21st century we do not actually know what the optimal usage of blood – red cells and platelets for the purpose of this article – actually is.

Blood transfusion services evolved in the aftermath of the Second World War and were set up on logistical models. It wasn't the role of the transfusion services to question blood use, as that was the job of surgeons. No clinical trials were performed comparing transfusion protocols. It is fair to point out that in the 1950s huge advances in surgery were being made that clearly required blood transfusion support and in those early days it would have been impossible to do studies of open heart surgery with reduced blood transfusion.

HOW MUCH BLOOD SHOULD BE USED?

Around 20 years or so ago it began to be apparent that there were wide differences in transfusion practice between different hospitals and different surgeons, with no apparent benefit at hospitals where high levels of transfusion was the norm. The most important factor seemed to be, and still is, the transfusion habits at the hospital level. An early and important study of transfusion variation was the Safe and Good Use of Blood In Surgery – SANGUIS study in 1993 that reviewed blood use in elective orthopaedic surgery in centres across Europe. By carefully balancing cases to be comparable, there was no difference in outcome despite wide variation in blood usage. A few years later, in 1999, the most influential study of transfusion use, the TRICC (Transfusion Requirements in Critical Care) study, showed that in some critically ill patients. more transfusion might have been harmful to patients. This study really kick-started the drive towards careful investigation of what is the appropriate transfusion for patients.

SAFE TRANSFUSION PRACTICE

In parallel with these developments, interest was growing in transfusion errors. Mark Popovsky in the USA undertook some studies of training junior doctors in transfusion practice, and saw reduced error rates and improved decision making. Crucially, however, training needed to be maintained as there was a rapid return to old ways. In 1994 Brian McClelland published a survey of transfusion errors which led to the establishment of the Serious Hazards of Transfusion scheme for the UK. This was not the first haemovigilance programme – the French had a mandatory system earlier – but as a co-ordinated professionally led voluntary programme SHOT has been highly influential in promoting the blood safety agenda. In order to support health professionals and ensure they are trained to ensure safe and effective transfusion, training programmes such as the on-line **"learnbloodtransfusion.org.uk"** have been developed.

OPTIMAL USE OF BLOOD IN THE 21ST CENTURY

So there are now two clear strands to what we now call Optimal Use of Blood. The drive towards identifying what is an appropriate transfusion – which may mean no blood at all – and the movement to improve the safety of the transfusion process.

How can the Optimal Use of Blood be defined? In the Manual for Optimal Blood Use, published in 2010 and deriving from a three year EU-funded project, the definition is *"Transfusion of the right unit of blood to the right patient at the right time, and in the right condition and according to appropriate guidelines."*

This requires a number of steps to be undertaken in order for it to be met.

- The patient must be assessed and decisions about the need for transfusions made. This deals with the issue of appropriateness of the transfusion.
- The blood transfusion requirements must be made clear to the laboratory and all necessary samples provided correctly labelled.
- The laboratory must prepare the components for transfusion accurately using the information and samples provided.
- The transport of blood components from the laboratory to the clinical area and the transfusion itself must be carried out accurately and in accordance with guidelines and local management arrangements. Storage requirements must be met.
- The effectiveness of the transfusion should be determined and the outcome entered into the patient record.

The first bullet-point remains the most challenging because there is still no objective data, tested in randomised controlled trials, to enable definite decisions on when to transfuse or not to transfuse. What has been evolved over the past decade are general guidelines, such that, for example, when the adult patient's haemoglobin is >100g/L it is rarely necessary to transfuse, and that below 60g/L it is usually necessary to transfuse red cell concentrates. In the main, these have evolved from experience where hospitals using less transfusion have been found to have as good survivals – sometimes better – than more heavy users. For platelets, there is also a lack of consistency. For some years there has been an acceptance that prophylactic platelet transfusions are indicated at a count of $<10 \times 10^9$/L – this followed a randomised controlled trial by Rebulla. But if the trigger is agreed what is the appropriate dose? Slichter and colleagues recently published a trial that suggested there was little evidence of any additional therapeutic benefit of larger platelet doses. So there remains uncertainty over the dose required, and even the trigger is being revisited in a trial that is considering whether prophylactic platelets are necessary at all.

It is useful to reflect that just because transfusion requirements appear to be reducing over time, that does not mean that past transfusions were unnecessary. Surgical techniques have changed greatly, being less invasive and with improved understanding of haemostasis. Indeed, surgical blood use now accounts for a minority of blood usage, with increases being seen in medical uses particularly haematology and gastroenterology.

THE FUTURE

There remains considerable uncertainty over where Optimal Blood Use will take us. An audit in a low use area suggested that 20% of transfusions were still outside guidelines, suggesting some way yet to go. A concern about under-transfusion has been voiced, especially in France, but it is likely that there have always been patients who have received inadequate transfusion support. There is little evidence that this is due to any Optimal Blood Use agenda. In the UK it is likely that there is considerable scope for red cell usage reductions at current activities – certainly over 10% and probably more. Surgical improvements will continue to reduce transfusion requirements, and the wider application of cell salvage would take things further. Against this, as the population ages and develops more chronic diseases that need transfusion support, more blood may be needed. Alcohol excess and the impact of Hepatitis C may also cause an increase in transfusion. New trauma management and massive transfusion protocols are not likely to make a significant impact on supply, though they will hopefully have a major impact on survival. At the bed-side, more education and training should lead to further improvement in transfusion security. Electronic tracking systems, that identify and record patients and the unit to be transfused, have great promise, but probably need a quantum change in price before they can be introduced widely.

It is easy to say that more research is needed, and it is, but the universal application of what we already know about transfusion requirements, cell salvage and bedside safety would lead to very substantial further progress.

Dr Ian Franklin
Medical & Scientific Director & Consultant Haematologist
Irish Blood Transfusion Service
Email: ian.franklin@ibts.ie

References

Sirchia G, Giovanetti AM, McClelland DBL, Fracchia GN (1994) Safe and Good Use of Blood in Surgery (SANGUIS): (Use of blood products and artificial colloids in 43 European hospitals) I.*EN[Note(s)*: [235 p] (bibl: 32 ref.), ISBN 92-826-4118-X.

Hébert PC, Wells G, Blajchman MA *et al* (1999) Transfusion Requirements in Critical Care [TRICC] Investigators. A multicenter, randomized, controlled clinical trial of transfusion requirements in critical care. Canadian Critical Care Trials Group. *N Engl J Med*; **340**(6):409-17.

Soumerai SB, Salem-Schatz S, Avorn J, Casteris CS, Ross-Degnan D, Popovsky MA (1993) A controlled trial of educational outreach to improve blood transfusion practice. *JAMA* **270**(8):961-6.

McClelland DB, Phillips P (1994) Errors in blood transfusion in Britain: Survey of hospital haematology departments. *BMJ*;**308**(6938):1205-6.

McClelland DBL, Pirie E & Franklin I M for the EU Optimal Use of Blood Project Partners (2010) Manual of Optimal Blood Use. Support for safe, clinically effective and efficient use of blood in Europe. Scottish National Blood Transfusion Service, Edinburgh. pp64. ISBN 978-0-9564680-0-0

Rebulla P, Finazzi G, Marangoni F, *et al* (1997) The threshold for prophylactic platelet transfusions in adults with acute myeloid leukemia. Gruppo Italiano Malattie Ematologiche Maligne dell'Adulto. *N Engl J Med*;**337**(26):1870-5.

Slichter SJ, Kaufman RM, Assmann SF, et al (2010) Dose of prophylactic platelet transfusions and prevention of hemorrhage. *N Engl J Med*;**362**(7):600-13.

Myalgic Encephalomyelitis and Donor Exclusion

On 1 November 2010 Myalgic Encephalomyelitis (ME) or Chronic Fatigue Syndrome (CFS) was added to the list of conditions for which we recommend the permanent exclusion of a blood donor. This decision caused a lot of discussion at the time with patient groups for sufferers of ME/CFS and fibromyalgia. The decision to add a permanent exclusion to the existing temporary deferral in the donor selection guidelines for people with ME/CFS from was taken solely to protect the health of the donor.

The exclusion of blood donors is for one or more of the following:

1) To protect the health of the recipient patient from anything that might be transmitted in the blood, infection, malignancy, or harmful drugs for example.
2) To protect the health of the donors, as 15% of their blood volume and significant quantities of iron is removed quite rapidly. They must be able to tolerate this cardiovascularly, and have the iron stores and physical capacity to compensate for the loss.
3) To ensure the quality of the product, ie haemoglobin level, clotting factors etc.

Historically the entry for ME/CFS in the donor selection guidance was for 'post viral fatigue syndrome'. An exclusion of a donor while symptomatic was recommended as a donor and patient protection measure. Donors were not accepted while symptomatic as this might risk transmission of the causative virus (if one existed) and it would be difficult for the donor to compensate for the donation, or their condition might be aggravated.

Donor Selection Guidelines for all UK blood transfusion services are implemented on the advice of the expert Blood Transfusion Services, Health Protection Agency Joint Professional Advisory Committee (JPAC) and in line with the Blood and Safety Quality Regulations 2005 (a statutory instrument). In 2009 JPAC reviewed the guidance on ME/CFS following publication of research on the possible role of xenotropic murine leukaemia virus-related virus (XMRV) in this condition. XMRV is a recently discovered retrovirus, first identified in 2006 in samples from men with prostate cancer. XMRV is closely related to a group of retroviruses called murine leukemia viruses (MLVs), which are known to cause cancer in certain mice. Both Lombardi and colleagues and Lo and colleagues found evidence of XMRV and murine leukaemia viruses, respectively, in large percentages of CFS patients and smaller percentages of healthy people. However other research in America and Europe has found no evidence of infection with XMRV among patients with ME/CFS and further recent research has continued to shed some doubt over the original identification of this virus in ME/CFS sufferers.

The research, the advice provided through the National Expert Panel for New and Emerging Infections (NEPNEI) and the Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) was reviewed. JPAC found no evidence that XMRV could be a risk to transfusion recipients.

However, the review brought to light the fact that, in contrast to other severe neurological conditions (for which the law requires a permanent exclusion from donation) there was no lifelong deferral of people who had had ME/CFS. It is recognised that there is some shared features between ME/CFS and fibromyalgia. At present, a donor with fibromyalgia (which is considered to be a musculoskeletal disorder) can be accepted as long as they were well at the time of donation and do not have any additional features of ME/CFS. Currently people who have had ME/CFS would not be excluded from donating tissues or organs.

Ultimately the decision of whether or not to offer an organ to a patient is with the surgeon who decides on a case by case basis the risk:benefit ratio. There is no evidence of ME/CFS having been transmitted via transplantation therefore there is currently no reason to deny any organ on this basis.

Dr Sue Barnes
Associate Medical Director (Donors)
NHSBT, Leeds
Email: susan.barnes@nhsbt.nhs.uk

References

Lombardi VC *et al* (2009) Detection of an infectious retrovirus, XMRV, in blood cells of patients with chronic fatigue syndrome. *Science*; **326**: 585-9.

Lo S-C *et al* (2010) Detection of MLV-related virus gene sequences in blood of patients with chronic fatigue syndrome and healthy blood donors. *Proceedings of the National Academy of Sciences* 0.1073/pnas.1006901107.

Switzer WM *et al* (2010) Absence of evidence of Xenotropic Murine Leukemia Virus-related virus infection in persons with Chronic Fatigue Syndrome and healthy controls in the United States. *Retrovirology*, 7:57.

van Kuppeveld FJ *et al* (2010) Prevalence of xenotropic murine leukaemia virus-related virus in patients with chronic fatigue syndrome in the Netherlands: retrospective analysis of samples from an established cohort. *BMJ*, **340**: 1018.

Groom HC *et al* (2010) Absence of xenotropic murine leukaemia virus-related virus in UK patients with chronic fatigue syndrome. *Retrovirology*, 7:10.

Erlwein O *et al* (2010) Failure to detect the novel retrovirus XMRV in chronic fatigue syndrome. *PLoS One*, 5:e8519.

Safe and Dignified: The Donation Chair

INTRODUCTION

Since the 1990s, donations of whole blood in England and North Wales have been taken using the "flat bed" shown in Figure 1. The current stock of these beds are now nearing the end of their working lives and need to be replaced.

Several attempts have been made to secure a suitable replacement. Following consideration of a number of reasons (see below for more details), NHSBT's clinical and operational view is now that donating in a seated position would have advantages over the current "traditional" prone/semi-prone position.

However despite worldwide searches, during two previous procurement exercises, it has become apparent that no existing "off-the-peg" model met all NHSBT's requirements.

Figure 1 Old style flat bed

CHANGING PRACTICES LEAD TO HEIGHTENED NEED

Our newer operational practices, implemented over the last couple of years, have meant that the existing beds have an increasing number of issues affecting both staff and donor safety as well as donor comfort. These include:

- Donation in the lying flat position does not facilitate regulatory control of blood pressure only serving to normalise blood pressure at a lower level and therefore could put donors at increased risk of feeling faint and fainting.
- The material that the existing beds are made from will not withstand the extensive use of the cleaning chemicals required in order to maintain a donation environment that meets the current infection prevention and control regulations.
- Many donors find the existing bed uncomfortable and/or feel that the donation position is undignified.
- Clinical literature shows that people feel vulnerable, anxious, threatened and not in control when lying down and this impacts negatively on the overall experience of donation.
- Staff have to carry the current bed to and from their vehicles into the session venues raising concerns about the manual handling risks involved.

- In setting up and down of the beds and, in particular, in dealing with an adverse event during donation, there are a number of trapping hazards raised by the existing bed.

TRANSLATING IDEAS INTO PRACTICE WHILST NOT AFFECTING COLLECTIONS

NHSBT required a replacement plan that avoided any compromise to the sufficiency of red cell supply when this equipment reached the end of its life. As a result NHSBT created a project, in conjunction with the NHS National Innovation Centre (NIC), using an innovative procurement approach whereby NHSBT commissioned designers to create a "fit-for-purpose" bespoke donation chair and associated trolley transport system that met the full range of NHSBT requirements. As a result NHSBT own the design rights for the chair and trolleys – this gives the benefit where appropriate of assigning the rights to a manufacturer in exchange for royalties from sales to other non-NHS organisations.

Figure 2 New donation chair

To justify this development, we intend to judge the chair and trolley system against the following benefits:

Benefits Description	Baseline	Target	Realisation Date
Contribute towards a reduction in the risk of faints post donation	248 per 10,000 donors bled	230 per 10,000 donors bled	31/03/2013
Reduction in reported staff injuries during loading/unloading and setup/ dismantling of chairs	43 per year	10 per year	31/03/2013
Reduction in reported staff injuries when donors faint while sitting on the side of the bed.	13 per year	3 per year	31/03/2013
Contributing towards improving donor satisfaction targets.	64.60%	68%	31/03/2013
Reduction in external major non-compliances (rolling 24 month KPI)	9	5	31/03/2013

Validation of the principles of the chair use have taken place on several collection teams in well over 20 different venues and taking over 200 donations. During this time all of those donors using it said they preferred the donation chair over the current donation bed.

PLANNING FULL IMPLEMENTATION

We plan to manage the procurement process to include an initial low volume production run of 24 chairs and four complete sets of trolleys. We can then make sure that the prototype is capable of scale up production and so that we can further test the manufacturing process. Our current plan is to have two full teams using these initial sets by September 2011.

It is planned that all beds will be replaced, subject to successful procurement and funding availability, with chairs by 2013.

Randle Derbyshire
Lead Operations Support Manager
Blood Donation
NHSBT, Milton Keynes
Email: randle.derbyshire@nhsbt.nhs.uk

Jane Pearson
Assistant Director of Blood Donation – Nursing
NHSBT, Birmingham
Email: jane.pearson@nhsbt.nhs.uk

Update on variant CJD

In Spring 2008, Professor Marc Turner, Medical Director of the Scottish National Blood Transfusion Service (SNBTS) and Chair of the UK Blood Services Prion Working Group, reviewed the risk of transmission of vCJD by blood and tissues, summarising the (then) current status of vCJD and its impact on the Blood Services, focusing on risk reduction measures by UK Blood Services. This article describes developments since then.

In early 2008 there had been 166 definite/probable cases of vCJD reported from the UK National CJD Research and Surveillance Unit (NCJDRSU). The total is now 175, with 1 to 3 cases reported each year from 2008. It therefore appears that the primary epidemic, in individuals with susceptible genetic make-up, is continuing to decline. Nevertheless, the prevalence of subclinical disease in the UK population remains at an estimate of 1 in 4,000 to 1 in 20,000.

INFECTIVITY AND TRANSMISSIBILITY

There have been no further documented transmissions from an infected donor since the fourth case reported in January 2007. In all four cases a donor developed clinical vCJD after donating blood, and a recipient showed evidence of vCJD infection: three died of clinical vCJD; the fourth died five years after transfusion without symptoms of vCJD, but with pathologically demonstrated infection.

In addition to transmissions from known infected donors, the UK Blood Services have investigated all cases of vCJD reported in transfusion recipients. Of 10 reports, one was within one year of transfusion and three cases are linked to a known infected donor (see above). The others have no identified infected donor, but in all six cases vCJD occurred more than four and a half years after transfusion, which could therefore plausibly be the source. Only one has been reported since 2008, and this is the only case in which leucodepleted blood components were transfused. All recipients had lived in the UK for many years, so transfusion and diet both remain possible sources of infection. In all six cases all identified blood donors remain free from symptoms of vCJD, but have been advised that they are considered "at risk" for vCJD and are excluded from donation of blood, tissues and organs.

BLOOD COMPONENT PROCESSING

Since 2008, prion reduction devices have become available and offer potential of a 3 to 4 log reduction in infectivity in blood components. These devices have been independently evaluated and the manufacturer's claim for reduction in infectivity has been confirmed. Clinical trials have been conducted to establish the quality and safety of the resultant blood components and specifically to establish that there are no possible adverse consequences such as the stimulation of red cell alloantibodies which could influence future transfusion needs.

The Advisory Committee on the Safety of Blood Tissues and Organs (SaBTO) was satisfied in October 2009 that there is sufficient evidence that the filters reduce infectivity. SaBTO recommended that filtered red cells be provided to those born since 1st January 1996, subject to satisfactory completion of the clinical trial. The trial progress is good: six-month follow-up of patients treated with prion filtered red cells will be complete in mid-2011, with follow-up of the control arm due to finish in late 2011.

ANIMAL STUDIES

Transmission studies in a sheep model have confirmed that infected sheep can transmit abnormal prions during the incubation stage of illness. Studies are proceeding using leucodepleted blood components to mimic the human situation, but breakthrough transmissions have occurred, confirming that leucodepletion will not necessarily be effective at removing the risk of transmission from an infected but asymptomatic donor.

DONOR SCREENING

In 2008 it was reported that 10 to 12 peripheral blood assays were under development. Sensitivity had proved a significant challenge, and very few of those prototype assays are being actively pursued by their commercial manufacturers as screening assays for asymptomatic individuals. In February 2011 a group from the MRC Prion Unit in London reported the first results of a blood based assay to detect prion infection in individuals with symptoms of vCJD. The assay sensitivity was several magnitudes higher than any previously reported, and the assay was scored as positive in a number of samples from patients with clinical vCJD. The assay sensitivity was 71.4% (15/21 symptomatic patients tested positive) and specificity was 100%, as no samples from patients with other neurological diseases, or from normal blood donors, scored positive. The authors concluded that their ability to detect prion infection in blood of symptomatic individuals shows that a blood screening test for asymptomatic individuals is technically feasible. This report is encouraging, but much more work is needed before it is known whether the assay forms a basis for a practical blood screening test. It will require greater sensitivity to detect the presumably lower amounts of abnormal prion protein present in the blood of infected but asymptomatic individuals. Assay specificity will require assessment on much larger numbers of samples from healthy individuals to assess the true initial and repeat reactive rates.

Within the Blood Services, SNBTS is working in collaboration with the NCJDRSU and the French Blood

Service to develop a confirmatory test for vCJD testing of blood and tissues. This test is in early stages of development and, due to its complexity, could not be used as a mass screening test. A confirmatory test would be highly desirable from the Blood Services' point of view, should a screening test become available.

DONOR SELECTION

People born after January 1st 1996 are believed not to have been exposed to infected animal produce through diet. The oldest cohort of this group are approaching 15 and will be eligible to become blood donors in two years' time. UK Blood Services are looking at the possibilities of recruiting this cohort to provide a "vCJD safe" panel, which could be used to provide blood components for younger age groups who currently receive clinical FFP imported from non-UK sources, but are exposed to UK-derived cellular blood components.

CONCLUSIONS

The uncertain prevalence of subclinical vCJD amongst donor populations in the UK remains. Progress with commercial development of blood screening tests has been disappointing, but preliminary results from the assay developed at the National Prion Clinic lend some optimism to the development of a prion blood screening test. Prion filters are effective at reducing, but not totally removing, the risk of transfusion-transmission of prions, but at significant cost. Issues of cost benefit and potential negative impact on donors have not changed and present very real challenges to the UK Blood Services.

Dr Patricia Hewitt
Consultant Specialist in Transfusion Microbiology
NHSBT, Colindale Centre
London
Email: patricia.hewitt@nhsbt.nhs.uk

References

Clewley JP, Kelly CM, Andrews *et al* (2009) Prevalence of disease related prion protein in anonymous tonsil specimens in Britain: cross sectional opportunistic survey. *BMJ* **338**: b1442

Edgeworth JA, Farmer M, Sicilia A, *et al* (2011) Detection of prion infection in variant Creutzfeld-Jakob disease: a blood-based assay. *Lancet* **377** (9764): 487-493

Ghani AC and Garske T (2010) Uncertainty in the tail of the Variant Creutzfeld-Jakob Disease epidemic in the UK. *PLoS ONE* **5**(12) e 15626

Houston F, McCutcheon S, Goldmann *et al* (2008) Prion diseases are efficiently transmitted by blood transfusion in sheep. *Blood* **112**: 4739- 4745

UK NCJDRSU and UK Blood Transfusion Services. Transfusion Medicine Epidemiology Review (TMER). http://www.cjd.ed.ac.uk/TMER/TMER.htm

Guidance for the Emergency Transfer of Blood with Patients Between Hospitals

INTRODUCTION

The aim of this guidance is to standardise procedures for the emergency ad hoc transfer of blood and components with patients. These recommendations, developed in collaboration between the NHSBT Appropriate Use of Blood Group and the National Laboratory Managers' Group of the CMO's National Blood Transfusion Committee, have been prompted by various changes including:

- The regulatory framework requiring a vein-to-vein audit trail between donor and recipient (EU directive 2002/98/EC; Blood Safety and Quality Regulations 2005 (as amended).
- Improvements in the transfusion process, especially in documentation and patient identification (Better Blood Transfusion initiatives).
- Changes in the clinical management of patients with major bleeding and increased centralisation of health services in formal clinical networks ("hub and spoke") reducing the need for transfer of blood with patients.

CHANGES IN CLINICAL PRACTICE

Experience within vascular surgery networks has shown that survival following emergency surgery is improved by the transfer of patients to specialised units. The provision of specialist surgeons, anaesthetists, theatre teams and intensive care facilities outweigh early emergency surgery in peripheral hospitals. Recent changes in our knowledge of resuscitation favour permissive hypotension – this involves restrictive rather than aggressive initial fluid replacement to avoid normalising the blood pressure which may increase the risk of bleeding. Also there is significant emphasis on rapid transfer of the patient, usually without medically qualified escorts. Blood transfusion is rarely used during transfer. Clear fluids are administered sparingly to maintain consciousness or a palpable radial pulse regardless of the blood pressure, which is kept low to prevent further bleeding.

Blood transfusion and component therapy administered in the dispatching hospital aims to render

the patient stable enough for transfer. Surgical "first aid" such as packing liver lacerations has the same aim; if the patient remains unstable they are usually unfit for transfer and have a very low chance of survival.

AUDIT OF TRANSFER OF BLOOD WITH PATIENTS

In the London and South East, 425 units of blood were transferred with 113 patients over a three month period. Over 75% were not used for the intended patient and of these 56% were wasted, largely due to inadequate packaging or temperature control. Only 2.7% patients were transfused en route. Audit via the North East Regional Transfusion Committee showed that only 5% of the units transferred were wasted, however, only 46% were transfused to the transferred patient. The remaining 49% with the cold chain verified, were subsequently accepted into hospital stock. Hospitals reported the need to re-crossmatch the units to allow issue by their own IT systems. (www.transfusionguidelines.co.uk).

AVOIDING TRANSFER OF BLOOD WITH PATIENTS

The receiving hospital is, by definition, a specialist centre with on site transfusion laboratory facilities. The blood group and antibody results can be communicated from the dispatching to the receiving hospital laboratory, to provide advance warning. If blood transfusion is required urgently in the receiving hospital, group O RhD negative or type specific blood can be issued immediately and transfused.

It is recommended that provision of cell salvage facilities (equipment and trained personnel) should be considered in tertiary centres receiving such patients and, where appropriate, be set up ready to receive the patient.

Blood which may have been difficult to source should be sent by taxi/courier directly to the receiving transfusion laboratory to avoid risk of wastage rather than being transferred with the patient.

RECOMMENDATIONS

Transfer of blood or components with a patient is required in exceptional circumstances only. This should be reserved for patients who will need transfusing during the journey. Two units of blood should be sufficient.

The transfusion laboratory should coordinate the transfer of blood and this should occur from laboratory to laboratory. Blood should never be transferred without the knowledge of the transfusion laboratory.

PRINCIPLES OF LABORATORY GUIDANCE FOR THE TRANSFER OF BLOOD

The cold chain is a temperature-controlled supply chain of storage and distribution activities which maintain a given temperature range. Insulated boxes containing cool packs, or other validated packaging materials must be used to ensure that the optimum temperature is maintained for transport. Records must be kept of transport of blood and components to maintain an audit trail of the cold chain. The fate of individual units must be recorded by both the receiving and dispatching hospitals.

The guidance including sample documents that hospitals may adapt for local use (including NHSBT Temperature Storage Validation, Transfer Form, Transport Box label and Blood Transfer advice for clinical staff) will be available at www.transfusionguidelines.co.uk

PROCEDURE FOR THE DISPATCHING HOSPITAL

It is essential to make suitable transport arrangements before following the local validated procedure for packaging and transport of blood. The dispatching hospital must complete and fax a copy of the transfer form to the receiving transfusion laboratory and should confirm the following:

- Dispatching transfusion laboratory contact details.
- Time of dispatch.
- Mode of transport (courier or ambulance with the patient).
- Estimated time of arrival.
- Number and type of units.
- Patient identification details and the ward or department (if known) expected to receive the patient.
- Patient's blood group, any antibodies, special requirements and recent transfusion history.
- Use of Shared Care Document if appropriate to communicate any special transfusion requirements.

PROCEDURE FOR THE RECEIVING HOSPITAL

The blood should be sent to the transfusion laboratory immediately on arrival at the receiving hospital. Local policies should ensure received blood is transferred to suitable storage facilities as soon as possible, taking note of the expiry time displayed on the transport box.

On arrival, transfusion laboratory staff should check the integrity of the transport box, complete the transfer documentation and check the blood is still under correct storage conditions.

Blood samples must be taken from the patient immediately and sent to the blood transfusion laboratory for testing.

Blood received must be entered on the LIMS and the fate of all units be accounted and recorded as follows:

- Transfused to the patient.
- Wasted due to breach of cold chain.
- Not transfused but entered into stock.

The receiving transfusion laboratory must inform the dispatching transfusion laboratory (preferably by fax) of the fate of the units. This ensures the correct fate of the units is recorded at both hospitals.

WRISTBANDS

Wristbands must be used to identify the patient during transfer. Most receiving hospitals will re-register the patient and issue a second set of wristbands. Communication between the clinical area and the transfusion laboratory is necessary to ensure that patient identification is managed in a safe and appropriate manner. A policy should be in place to minimise the risk of multiple hospital numbers and, wherever possible, the NHS number should be incorporated.

Dr Shubha Allard
Consultant Haematologist
Barts and the London NHS Trust & NHS Blood and Transplant – Chair NHSBT Appropriate Use Group
Email: shubha.allard@bartsandthelondon.nhs.uk

Anna Capps-Jenner
Transfusion Laboratory Manager, Ealing Hospital NHS Trust – Representing the National Laboratory Managers' Group of the CMO's National Blood Transfusion Committee
Email: A.Capps-Jenner@tdlpathology.com

References

http://www.vascularsociety.org.uk/library/vascular-society-publications.html – The Provision of Emergency Vascular Services 2007.

Stahel PF, Smith WR, Moore EE (2009) Current trends in resuscitation strategy for the multiply injured patient. *Injury* **40**: Suppl 4:S27-35.

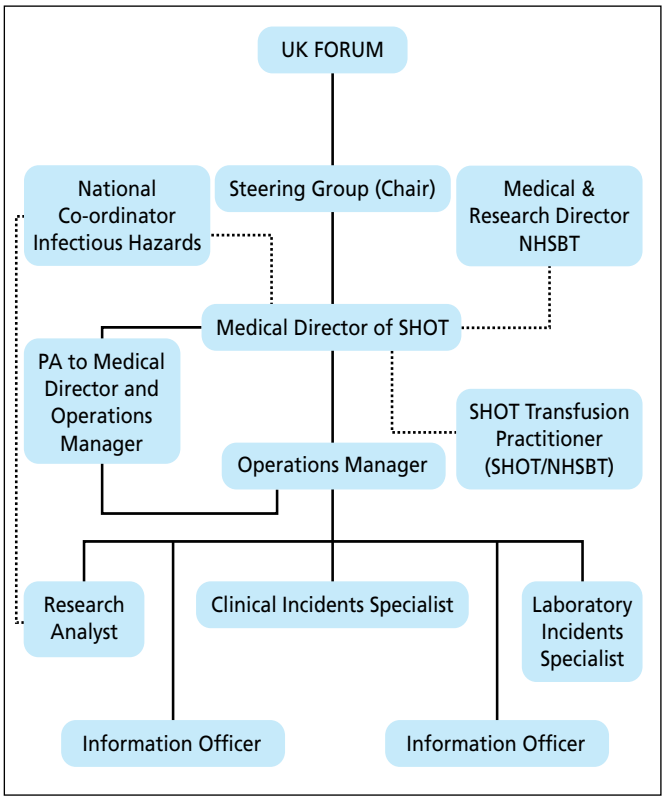
Geeraedts LM, Kaasjager HA, van Vugt AB, Frolke JP (2009) Exsanguination in trauma: A review of diagnostics and treatment options. *Injury* Jan;**40**(1):11-20.

SERIOUS HAZARDS OF TRANSFUSION **SHOT**

SHOT Reporting and The Role of the Incidents Specialists

Serious Hazards of Transfusion (SHOT) was established in 1996 and is the UK's independent professionally led haemovigilance scheme for the reporting of transfusion related serious adverse reactions/events (SAR/SAE). SHOT is funded by the four UK blood services via the UK Forum and is affiliated to the Royal College of Pathologists. It collects and analyses anonymised data relating to adverse events and reactions in blood transfusion from all healthcare organisations that are involved in the transfusion of blood and blood components in the United Kingdom. SHOT also collects data relating to incidents concerning the administration of anti-D and the use of intra operative and post operative cell salvage. Where risks and problems are identified, SHOT produces recommendations to improve patient safety.

SHOT consists of the SHOT office staff, the Steering Group and the Working Expert Group (WEG). The Steering Group provides professional ownership, strategic direction and monitors SHOT's performance. Steering Group membership includes designated representatives from the Royal Colleges and other professional bodies who bring views and ideas from their professional organisations to be discussed at the six monthly Steering Group meetings.



The WEG is an expert professional panel who analyse the SHOT data relevant to their area of expertise. They also initiate research, studies and audit relating to the blood transfusion process for and on behalf of SHOT. This may involve collaboration with allied organisations.

All members of the WEG are members of the Steering Group in their own right. The SHOT Medical Director acts as the Steering Group secretary and is professionally accountable through the Steering Group chair.

All adverse transfusion reactions and events should initially be reviewed by the Hospital Transfusion Team, who will decide whether it can be dealt with as an internal Trust incident or if it is externally reportable to The Medicines & Healthcare products Regulatory Agency (MHRA) and/or to SHOT.

The MHRA are the Competent Authority on behalf of the Secretary of State with regard to the Blood Safety and Quality Regulations 2005 (BSQR) and mandate the reporting of adverse reactions in patients and quality incidents related to the collection, issue, storage or distribution of blood components. SHOT accepts reports covering the entire spectrum of the transfusion process, including patient sample taking and other process errors made in the clinical area.

Reporting to SHOT is now required by a number of accreditation and quality inspection organisations and government bodies, such as Clinical Pathology Accreditation Ltd (CPA UK), Department of Health, Better Blood Transfusion initiative, NHS Quality Improvement Scotland and Healthcare Standards for Wales.

If the Hospital Transfusion Team determine that an incident is SHOT reportable, they need to select the 'share this report with SHOT' or the 'SHOT only' box on the SABRE database. In January 2010 SHOT launched a new online database designed in collaboration with Dendrite Clinical Systems™ to streamline reporting and enhance data capture to aid a more comprehensive analysis. Between January and December of 2010 over 3,000 reports were received via Dendrite.

Once the reporter has chosen to report to SHOT, the SABRE database will send a message the SHOT Dendrite database and create a record. An e-mail will be sent to the reporter with a link to Dendrite enabling them to complete a report. The reporter must then choose which category the SAE/SAR falls into. Documents with more information about 'Reporting to SHOT' and 'Definitions of Current SHOT Categories and What to Report' can be found on the SHOT website.

All completed SHOT Dendrite reports will be reviewed internally by the Clinical Incidents Specialist or Laboratory Incidents Specialist to ensure that the incidents have been categorised correctly. At the end of each year all of the anonymised data is divided into the individual SHOT categories and is forwarded to the relevant Working Expert Group (WEG) chapter authors. The Incidents Specialists act as the liaison between the WEG members and the hospital reporters if further information is required. The WEG members incorporate their analysis into their specific chapter and it is these that formulate the annual SHOT report. Analysis of these data identifies common themes, which will form the basis of the recommendations that aim to improve transfusion standards, reduce risk of errors and ultimately make transfusion safer for patients. The monitoring of trends that are identified following data analysis provides a benchmark against which the effectiveness of blood safety initiatives can be measured.

The SHOT Annual Report is published in June/July of each year to coincide with the requirement to submit annualised haemovigilance data to the EU Commission. In 2011 the 14th SHOT Annual Report was launched at the SHOT Symposium, held at Royal Society of Medicine in London, which was well attended and was a great success. Following the launch, the report it is widely distributed to a number of government and NHS bodies within the UK as well as to members of all the Hospital Transfusion Teams at reporting hospitals.

SHOT exhibits and presents at both national and international transfusion conferences to ensure that the SHOT Report reaches as wide an audience as possible. These activities provide an opportunity to meet a variety of personnel and are one of the best ways to promote SHOT and the significance of haemovigilance.

The SHOT Laboratory and Clinical Incident Specialists produce educational material, for example a questionnaire, including case studies, has been developed to look at incident reporting in both clinical and laboratory areas with the aim of identifying best practice when reporting SAR/SAE to SHOT. Feedback from this should establish areas in which we need to raise awareness and also act as a benchmark against which to measure future initiatives.

Further information relating to reporting categories alongside contact details for any further advice or guidance can be found on the SHOT website **www.shotuk.org**

Julie Ball
Clinical Incidents Specialist
SHOT Office
Manchester
Email: julie.ball@nhsbt.nhs.uk

NOTE: This article was first published in the British Blood Transfusion Society magazine, Bloodlines (Issue 98). If you would like more information about the BBTS, go to ***www.bbts.org.uk***

Common Inherited Disorders of Clotting: Part 2

Inherited deficiencies of plasma proteins involved in blood coagulation generally lead to lifelong bleeding disorders, whose severity is inversely proportional to the degree of factor deficiency. Haemophilia A and B, inherited as X-linked recessive traits, are the most common hereditary hemorrhagic disorders caused by a deficiency or dysfunction of blood coagulation factor VIII (FVIII) and factor IX (FIX) respectively. Together with von Willebrand disease, a defect of primary haemostasis, these disorders account for approximately 95% inherited coagulation factor deficiencies and are discussed below.

VON WILLEBRAND DISEASE

Abnormalities of Von Willebrand factor (VWF) result in von Willebrand disease (VWD), a bleeding tendency characterized by mucocutaneous bleeding: menorrhagia, epistaxis, easy bruising and prolonged bleeding post dental extraction. This is the consequence of the molecule's dual physiological role: VWF multimers play an important role in primary haemostasis forming an adhesive bridge between platelets and the subendothelium and also contribute to fibrin generation by acting as a carrier protein for FVIII. VWF abnormalities thus lead to impaired platelet adhesion and aggregation and reduced FVIII half-life. Abnormalities may be quantitative or qualitative – the latter is particularly relevant as VWF is a complex multimeric glycoprotein with the largest multimers being the most haemostatically active. Specific functions also map to specific VWF domains. Those of particular relevance are the D'/D3 domain which binds FVIII and the A1 domain which binds to platelet GP1b receptor. Three VWD subtypes are recognized: types 1 and 3 represent quantitative variants and type 2 qualitative abnormalities.

Type 1 VWD is the commonest autosomally inherited bleeding disorder affecting up to 1% population. It is the result of a partial deficiency of essentially normal VWF. Missense mutations predominate in type 1 VWD and act through mechanisms including rapid clearance and intracellular retention of VWF. Many mutations however are incompletely penetrant and attributing pathogenicity is challenging. Furthermore in up to 30% affected individuals no VWF gene mutation can be identified. In these cases confounding factors such as blood group O and platelet abnormalities may contribute to reduced VWF levels and symptoms.

Missense mutations affecting platelet- or FVIII-binding are responsible for the four type 2 subtypes; 2A, 2B, 2M and 2N. In type 2A disease high molecular weight VWF multimers are decreased either because of abnormal VWF dimer synthesis or increased susceptibility to post secretory VWF cleavage by the metalloprotease ADAMTS-13. Defective VWF dependent platelet adhesion results (see Table 1). Type 2B disease is the result of gain of function mutations within the A1 domain which binds to the platelet GP1b receptor. Physiologically increased binding leads to preferential loss of large VWF multimers and thrombocytopenia. In type 2M VWD VWF platelet interactions are impaired but high molecular weight multimers preserved. Causative mutations have again been localized to the A1 domain but at sites distinct from those of type 2B mutations. Type 2N VWD is caused by mutations within the FVIII binding site of VWF which spans the D' and part of the D3 domain. FVIII levels are reduced whilst platelet adhesive function is unaffected so that type 2N VWD masquerades as an autosomal recessive form of haemophilia A. It is therefore an important differential of any individual (male or female) presenting with a low FVIII.

Table 1: Type 2 Von Willebrand Disease Summary

Subtype	HMW VWF multimers	VWF-platelet interaction	Platelet count	FVIII	Mutation location	Pathophysiology
2A	Decreased	Impaired	Normal	Normal	A2 domain D2 domain	Enhanced proteolysis by ADAMTS-13 Impaired multimer assembly
2B	Decreased	Increased	Decreased	Normal	A1 domain	Increased VWF platelet binding leading to increased proteolytic degradation and loss of HMW VWF
2M	Preserved	Impaired	Normal	Normal	A1 domain A3 domain	Reduced platelet binding
2N	Preserved	Normal	Normal	Decreased	D'domain D3 domain	Reduced FVIII binding

Type 3 VWD is characterized by undetectable VWF protein and activity and FVIII levels of less than 10%. Affected individuals therefore have a bleeding phenotype akin to haemophilia A with a risk of haemarthroses in addition to severe mucosal haemorrhage. Nonsense and frameshift mutations distributed throughout the VWF gene are usually responsible.

HAEMOPHILIA A AND B

FIX, a serine protease together with its non-enzymatic cofactor FVIII form the Xase complex with cleaves factor X to generate the active enzyme Xa. Deficiencies of either FVIII or IX result in reduced Xase activity and thus severe haemorrhagic diatheses characterized by recurrent joint or muscle bleeds known as haemophilia A and B respectively.

Haemophilia A is an X linked recessive disorder with an incidence of approximately 1 in 10,000 births. Prolonged, delayed or renewed bleeding following trauma or spontaneous muscle or joint bleeds is typical. The bleeding severity can usually be accurately predicted by the level of residual FVIII activity. Some patients however with identical FVIII missense mutations have a variable bleeding phenotype suggesting modifying factors – possibly thrombophilia mutations – may influence clinical presentation. This apart, factor levels below 1% are typically associated with severe bleeding, levels between 1 – 5% with moderate bleeding and those with values of 5 – 25% with mild bleeding. Consequently patients with severe disease are usually diagnosed within the first year of life, those with moderate disease by five to six years of age whilst those only mildly affected may not be diagnosed until adulthood. Mutations in the FVIII gene are causative. The Haldane hypothesis predicts that one third of all patients with a lethal sporadic X linked disorder such as haemophilia A should represent new mutations. Such a high spontaneous mutation rate might be expected to lead to different mutations in unrelated haemophilia A patients. In fact 45% severe haemophilia A cases are associated with inversion of intron 22 as this region of the FVIII gene is particularly prone to rearrangement.

HAEMOPHILIA B

The clinical presentation of haemophilia B is indistinguishable from haemophilia A. It too is an X linked recessive disorder and it accounts for 20 – 25% haemophilia cases. Like haemophilia A the bleeding severity can usually be predicted by residual FIX activity. Haemophilia B results from heterogeneous mutations throughout the FIX gene. Mutations in the promoter region of the gene are of particular interest as these are associated with haemophilia B Leyden. This haemophilia B variant is unique in being characterized by low FIX levels in childhood with a severe bleeding tendency which resolves during adolescence due to normalization of FIX levels. This can be explained by age-related FIX gene regulation mediated by a puberty-onset gene switch: the age-related stability element.

INHIBITOR FORMATION

In both haemophilia A and B patient care has been transformed by the introduction of specific factor concentrates, initially plasma derived and latterly recombinant. Inhibitor formation now represents the major complication of patient care and occurs at a frequency of 20 – 30% in severe haemophilia A and 3% in haemophilia B. Those mutations that result in the absence or severe truncation of FVIII/FIX proteins such as inversion of intron 22 in haemophilia A are associated with the highest risk for inhibitor formation. Thus presentation of a novel antigen is often causative. Alternatively the immunogenicity of the FVIII protein may be altered: missense mutations in the C1/C2 domains are particularly associated with inhibitor formation in mild haemophilia A. Genetic predisposition and environmental causes however also play a role: certain HLA subtypes predispose to inhibitor formation whilst discordant inhibitor status has been observed in monozygotic twins.

SUMMARY

The classical bleeding phenotypes associated with VWD and haemophilia A and B have long been recognized. Recent advances in their molecular basis now permit genotype-phenotype correlations to be made, advancing our understanding whilst permitting carrier status, prenatal diagnosis and inhibitor formation risk to be determined.

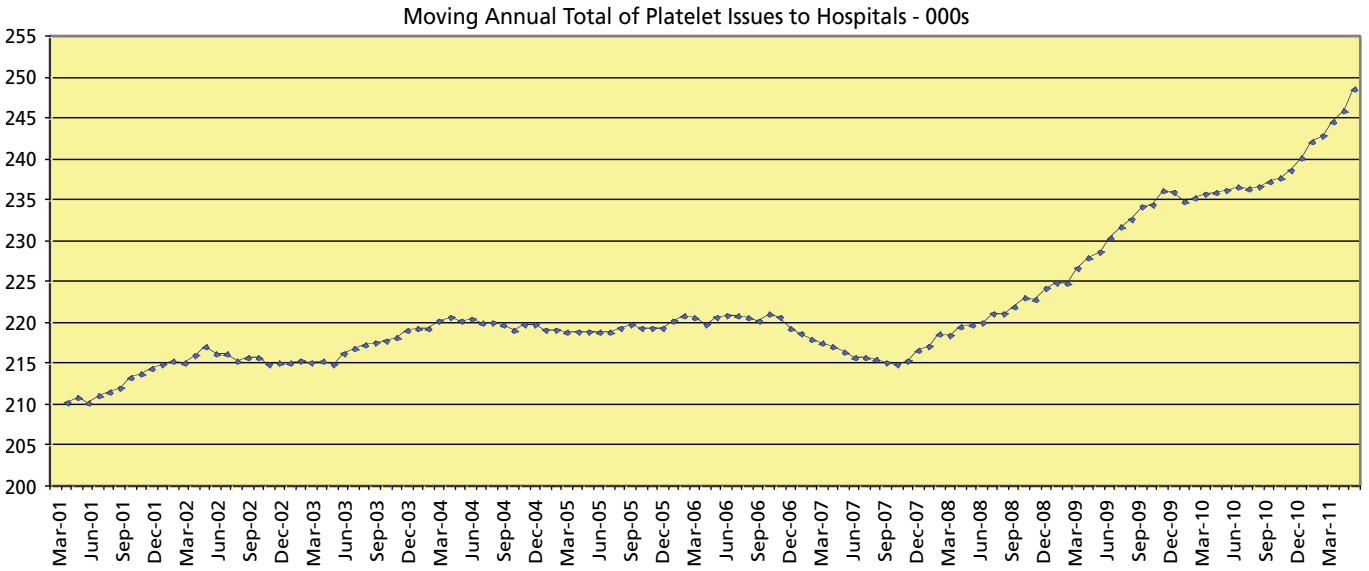
Dr Sarah Allford
Consultant Haematologist
Taunton & Somerset NHS Trust
Email: sarah.allford@tst.nhs.uk

An Audit of Use and Wastage in the North West of England and North Wales: Where Have all the Platelets Gone?

INTRODUCTION

Over the past few years there has been a continuing increase in the use of platelets (Figure 1). The National Comparative Audit (NCA) of the Use of Platelets in 2007 found that up to 45% of platelet transfusions did not comply with the audit standards. One of the recommendations from the report was that hospitals should carry out regular audits of compliance with guidelines on platelet use. In addition, NHS Blood and Transplant (NHSBT) requires information on the use of platelets, including the demographics of patients receiving platelets to allow for effective planning of supply and to understand the impact of introducing safety measures. The North West Regional Transfusion Committee incorporating North Wales (NWRTC) therefore commissioned a regional audit of platelet usage and wastage, intended to complement the follow up National Comparative Audit on Platelet use in Haematology patients.

Figure 1: NHSBT Platelet issues to hospitals March 2001 to May 2011



METHODS

Audit standards were developed from the recommendations of the National Comparative Audit on platelets of 2007, the British Committee for Standards in Haematology (BCSH) Guidelines on platelets and the Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO). All NHS and Independent Hospitals/Trusts in North West England and North Wales were invited to participate. The audit consisted of an organisational survey and a single page proforma to be completed on each transfusion episode occurring during the month of March 2010 using data available in the hospital transfusion laboratory without the need to review the patient's case notes. Participating hospitals received reports on their individual data together with regional results for comparison.

AUDIT SAMPLE

32 of 34 NHS Hospitals/Trusts in the North West of England and North Wales participated (94%). In addition, three independent hospitals were invited but none took part. Audit proformas were completed on 1,550 platelet transfusion episodes, accounting for 1,911 doses of platelets. During the period, 2,613 platelet doses were issued to these hospitals by NHSBT. Data collection therefore captured 73% (1,911/2,613) of platelets issued in March 2010.

RESULTS

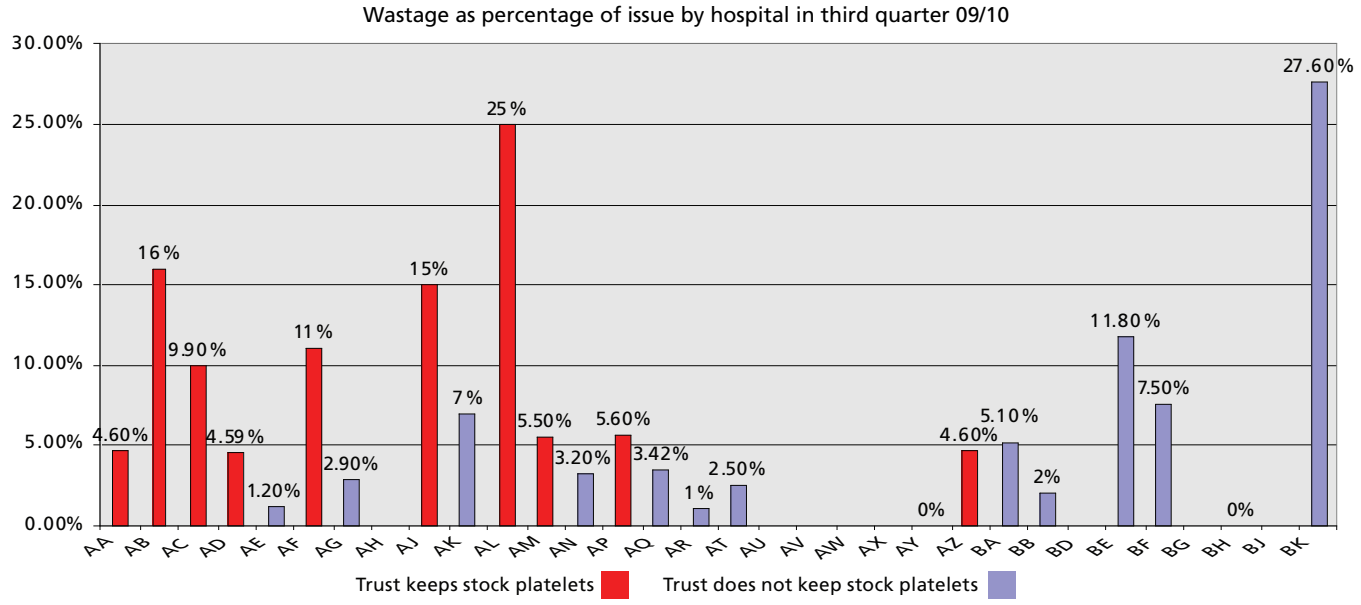
THE ORGANISATIONAL QUESTIONNAIRE

Of centres responding to the organisational questionnaire, 26/32 (81%) reported the existence of guidelines for platelet use; 18 (56%) had a specific guideline for haematology, nine (28%) for adult intensive care (AICU), and seven (22%) for neonatal intensive care (NICU). 27/32 (84%) had a guideline for massive haemorrhage. 11/32 centres had not undertaken an audit of platelet use within the last five years. The majority of Trusts (17/24) did not incorporate the National Indication codes for platelet requesting. 56% (18/32 trusts) operated a 'vetting' procedure through a combination of Biomedical Scientist and Haematology medical staff.

PLATELET WASTAGE

31/32 centres participated in the Blood Stocks Management Scheme. Platelet wastage, expressed as percentage of issue, in the third quarter of 2009/10 varied in Trusts between 0% and 27.6% (Figure 2). There was a tendency for centres holding stock to have more wastage (mean of 10% vs mean of 6%).

Figure 2: Wastage as percentage of issue by Trust in third quarter of 09/10



PLATELET USAGE

There was a wide variation between Trusts in the number of platelet transfusion episodes in the month, ranging from 4 to 160.

As in previous surveys, haematology was the commonest clinical speciality for platelet use at 57%. Of the other specialties there was a fairly even spread, with the next five largest specialties being: ITU 7.9%, cardiac surgery 6.5%, oncology 6.3%, general medicine 5.4% and general surgery 3.7%. There was very little platelet use in A+E, orthopaedics and trauma and obstetrics (see Figure 3).

There was increasing use of platelets with age, with patients in their seventies being the group with the most episodes (25% of the total). 100 episodes (6.5%) occurred in the neonatal period and a further 110 (7.1%) in children and young adults (1-18 years). In infants aged < 1 year, 65% of platelet transfusions were given in the absence of documented bleeding or surgical procedure.

64% of transfusion episodes were for prophylaxis, 22% for bleeding and in 14% the indication was not recorded. 65% of platelets were given for prophylaxis (n=983), when the platelet count was greater than 10 x 10^9/l. When looking specifically at prophylaxis in haematology patients, 56% of transfusion episodes occurred when the platelet count was greater than the recommended threshold of 10 x 10^9/l or 20 x 10^9/l if evidence of additional risk factors.

STANDARDS OF PLATELET REQUESTING

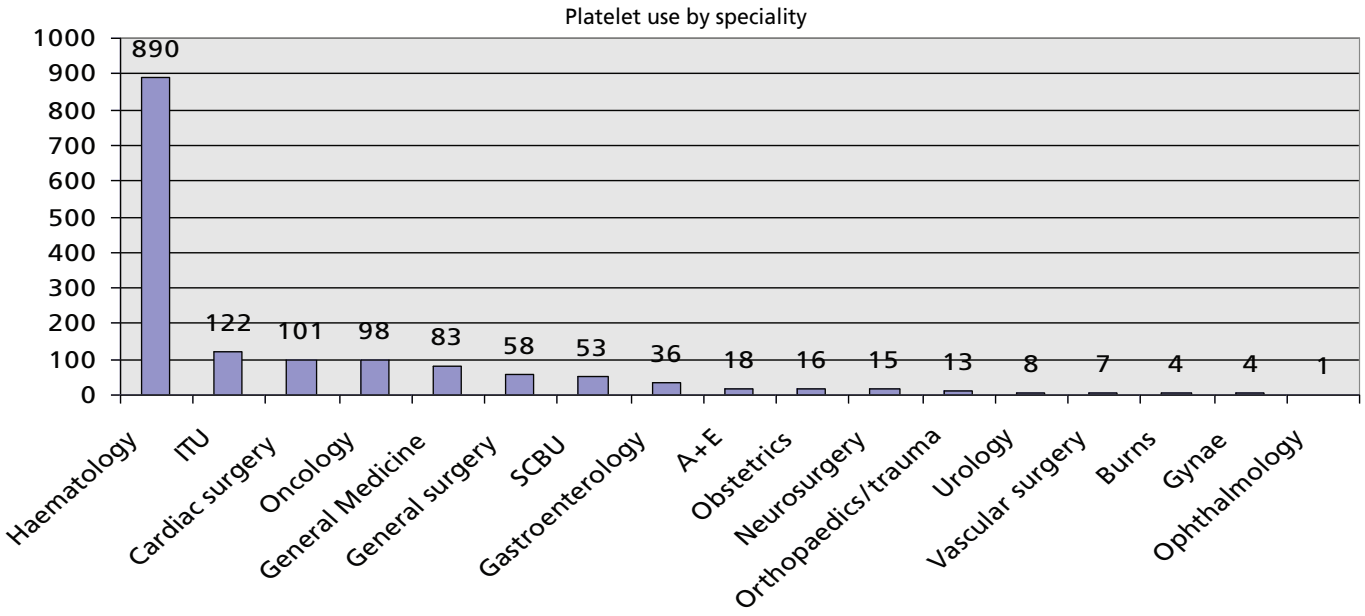
95% of requests had a record of the clinical reason for platelet use and 96.4% of episodes had a pre transfusion platelet count recorded. 70% were taken on the day of transfusion. 79% of transfusion episodes were followed up with a post transfusion platelet count but only 24% on the day of transfusion.

DISCUSSION

The aim of this audit was to evaluate the use of platelets by comparison to current BCSH guidelines, and to compare practice between Trusts in the North West of England and North Wales. There was significant variation between Trusts, but clear evidence that many of the transfusion episodes did not meet the BCSH standards. Not all Trusts had guidelines on platelet use and there was still a significant minority of doctors who were not receiving training in this area. It was also clear that audits on platelet use have not been undertaken on a regular basis.

Improvement in the level of appropriate requesting requires development of locally agreed guidelines based on national recommendations, effective dissemination of the guidelines through education and audit and the use of tools such as specific request forms with a menu of accepted indications (or electronic equivalent). The information provided at the time of the platelet request should be accurate and detailed enough to allow for effective vetting of the request by BMS and/or Haematology medical staff. In addition, each request

Figure 3: Platelet use by speciality



should be ideally linked with a pre platelet count again to support vetting of requests and a post transfusion platelet count should be taken as part of the assessment of the response to platelet transfusion.

The information collected in this audit has contributed to an analysis of blood demand drivers by the Department of Health that will be used by NHSBT to plan future platelet supply.

Correspondence:

Kate Pendry
Consultant Haematologist
NHSBT and Central Manchester University Hospitals NHS Foundation Trust
Email: kate.pendry@nhsbt.nhs.uk

Tony Davies
Transfusion Liaison Practitioner
NHSBT Better Blood Transfusion Team & SHOT

Acknowledgements:

Staff of participating hospitals, Jane Murphy NWRTC Administrative Assistant and Mike Patel Clinical Audit Officer NHSBT

References

National Comparative Audit of Blood Transfusion: Audit of Use of Platelets March 2007 http://hospital.blood.co.uk/library/pdf/Platelet_%20Audit_St_Elsewhere's_NHS_Foundation_Trust.pdf

British Committee for Standards in Haematology (2003) Guidelines for the use of platelet transfusions *British Journal of Haematology* **122**: 10-23

Understanding Platelet Usage in Wales Abstract No. 524 XXXIst International Congress of the ISBT, Berlin, Germany April 2010

South West RTC Audit of Platelet Use 2005 http://www.transfusionguidelines.org.uk/docs/pdfs/rtc-sw_audit_platelet_2005_new.pdf

NHSBT Tissue Services Retrieval Team Training Review 2009 Onwards

NHS Blood and Transplant, Tissue Services is the UK's major provider of human tissue for transplant. Our role is to co-ordinate, recover, process, bank and supply human tissue grafts for use in surgery within the NHS and independent hospitals in the UK. As part of the NHS, we operate as a not-for-profit organisation, with patient safety our core principle. Tissue Services is a multidisciplinary department within the Specialist Services function within NHS Blood and Transplant split into three discrete functions, Donation, Tissue Bank (Processing, Storage and Tissue Issue) and Research and Development. The Tissue Bank and Research and Development functions are housed in a purpose-built facility based in Liverpool, which is the largest Tissue Bank facility in Europe.

The Donation function is further divided into four discrete teams, three Regional Donation Teams, based in Colindale, Leeds and Liverpool and the National Referral Centre based in Liverpool. The National Referral Centre deals with all deceased tissue donor referrals throughout the United Kingdom and obtains lawful consent for tissue donation from all suitable donors. The Regional Donation Teams are involved in both the surgical and deceased tissue donation programmes from development and educational awareness to external stakeholders through to operational and facilitation of tissue donation. For the deceased donation programme, Tissue Services is unique within Europe in that our highly skilled, expert Donation Teams, comprising of Scientific and Nursing staff, perform the retrieval of tissues in accordance with the European Tissue and Cells Directive (2004/23/EC; 2006/17/EC; 2006/86/EC) and Human Tissue Authority Codes of Practice.

Looking specifically at the Regional Donation teams, each are comprised of Lead Tissue Donation Practitioners, Tissue Donation Practitioners and Tissue Donation Assistants. All of whom have set knowledge, skills and experience required to ensure they are fully trained and competent in the specialist role that they fulfil. This is particularly pertinent as Tissue Banking is such a unique speciality within the healthcare field, and as such there are no external specialised training programmes available for staff to attend or development themselves further. Therefore to ensure compliance with all regulatory requirements it is essential that a full training and competency package is available for the staff.

The parent directive for cells and tissues states, *"Personnel must be provided with initial/basic training as required when procedures change or scientific knowledge develops and adequate opportunities for relevant professional development."*

During 2009, it was acknowledged that although the task based competence and related knowledge was excellent, it was becoming apparent the scientific rationale behind the processes and clinical knowledge was limited and was inconsistent throughout the three Donation teams. In response to this, competency assessments were designed to ascertain the knowledge level of each member in the team primarily towards the deceased donation programme to allow us to propose a training programme to bridge all the relevant gaps.

Initial competency assessments were designed specifically for the Lead Tissue Donation Practitioners and Tissue Donation Practitioners who undertake a "Team Leader" role on deceased tissue retrievals. As Team Leaders, the Practitioners are responsible for the donation of tissues from the deceased donor where consent has been obtained in line with the Human Tissue Act and Human Tissue Authority Codes of Practice and the EU Directive for Cells and Tissues. The competency assessments comprised of over 20 scenarios based on real deceased tissue retrieval situations where the teams are working remotely on NHS Trust premises without direct Management supervision. Each scenario assessed how the Team Leader would react to an unexpected situation from the deceased donor identification problems, equipment failures to rationale for the Hospital location where a donation can take place and why.

The outcome from the Team Leader assessments was very high which confirmed that the Practitioners were highly skilled at handling difficult and often unexpected situations.

A general knowledge paper was designed for all staff within the Regional Donation teams enabling us to gain an understanding of the general base line knowledge of the teams so we could address gaps with specific training as required. This paper assessed the scientific rationale of processes within the deceased retrieval process.

The outcome from the general paper was varied and was evident that a formal training programme needed to be defined to ensure the knowledge gaps were closed whilst ensuring the staff competency was continually assessed.

In response to the assessment outcomes, a new competency based training scheme for the Donation Team was launched. The competency handbook comprises of core modules such as health and safety, information governance and donor blood testing, to specific tissue banking modules such as retrieval of skin tissue and facilitating training sessions for the surgical bone donation

programme. To complement the competency modules, bi-annual training days have been mandated for all retrieval staff which will focus on specific modules in the competency framework where experts are invited to educate the staff. Recent training days have been very successful and have concentrated on the themes below:

Spring 2010 Training Day

- Donor identification workshop
- Physical examination of the deceased donor workshop
- DNA profiling – use in donor identification
- Paediatric/Neonatal Heart Valve anomalies

Autumn 2010 Training Day

- Deceased donor blood testing
- Organ donation
- Anatomy of Musculoskeletal tissue
- Transplantation of Musculoskeletal tissue

Feedback from the training days to date has been excellent and the outcome, following the tests of understanding, has been to a high standard. The training and competency assessment programme will continue as a full development and education programme for the retrieval teams and it is hoped over time, once the base-line knowledge is met, it will be possible to develop a two-tiered system to allow staff to progress and complete the British Association for Tissue Banking (BATB)/British Blood Transfusion Society (BBTS) Specialist Certificate in Cell and Tissue Transplantation Science.

Amanda Ranson
Regional Tissue Donation Manager
NHSBT, Colindale
Email: amanda.ranson@nhsbt.nhs.uk

Therapeutic Apheresis – Current Practices, Future Challenges and Opportunities

Therapeutic apheresis is a treatment modality in which apheresis technology is used to manipulate patient's circulatory contents through removal or exchange, to achieve a therapeutic target. This includes plasma exchange, red cell exchange, stem cells and lymphocyte collections, removal of excess blood cells in haematopoietic malignancies and removal of low-density lipoproteins or immunoglobulin using adsorption columns, as well as many other applications.

Apheresis systems can be of two types: centrifugal, which uses G-force to separate blood into its components and the less versatile filtration systems, which separates plasma from blood cells. The correct choice of technology is a crucial step in setting up a therapeutic service. The type of apheresis procedures required is a factor for consideration and although most machines are efficient in exchanging plasma, stem cell collections require a machine that is particularly efficient in this procedure. On the other hand, Extra Corporeal Photopheresis (ECP) and lipid depletion are best carried out using machines specifically designed for this purpose. Another factor to consider is machine requirements for single or double points of access to patient circulation. Single needle machines are kinder to patients but they may take a longer time to complete a procedure. Machines with small extra-corporal volumes suit young children and adults with low haemoglobin levels.

The analysis of the literature for evidence-based practice in therapeutic apheresis could prove confusing. This is because disorders treated by apheresis are spread across many specialities and apheresis systems used are also variable. It is beyond the capacity of a single specialist to assess evidence in all clinical situations where therapeutic apheresis would be considered. The American Society for Apheresis (ASFA), however, has produced a reasonably comprehensive review of evidence to support (or otherwise), the use of apheresis in relevant clinical scenarios. The ASFA guidelines on the use of therapeutic apheresis in clinical practice remain a reliable reference for most clinicians.

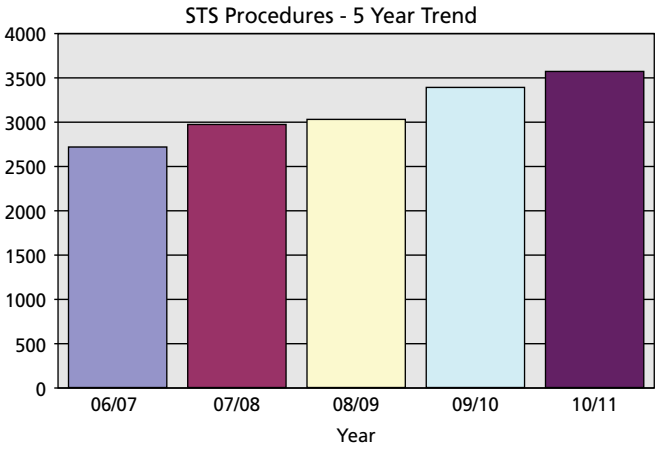
An important challenge facing therapeutic apheresis practice is the usually small numbers of procedures required in an average size hospital (for example, in comparison with dialysis procedures) and the unpredictable timing of many of these procedures, especially plasma exchange for Thrombotic Thrombocytopenic Purpura (TTP), red cell exchange for sickle emergencies and the collection of autologous stem cells. This makes it difficult for hospital management to allocate dedicated staff to undertake this work, which invariably results in problems for operators maintaining their competency. In the UK, most apheresis procedures are carried out by trained nurses in haematology or renal departments, who usually have other competing clinical commitments. Another complicating issue is that patients

who require therapeutic apheresis come from different specialities such as haematology, nephrology, neurology, rheumatology, transplant and lipid clinics. Consequently, the overall business management of apheresis is complex and the senior medical input into the service is a challenge. It is hard for Consultants to dedicate enough time in their roles to develop an interest in the field. Moreover, regulatory accreditations are required for Haemopoietic Stem Cell collections by the Human Tissue Agency (HTA) and The Joint Accreditation Committee-ISCT (Europe) & EBMT (JACIE). Robust care pathways to satisfy clinical governance are required for all patients. The funding agreements for certain procedures (such as ECP) are complicated and require specialist commissioning skills. A combination of these factors present a challenge for an organisation to maintain a responsive therapeutic apheresis service. On some occasions, patients are either sent to another service provider or less effective alternative therapies are used. Alternative therapies include plasma infusion for TTP, manual red cell exchange in sickle cell disease and the use of intravenous immunoglobulin (IVIG) in certain autoimmune disorders.

Therapeutic apheresis provision could be improved by increasing the size of the service, which better supports the allocation of adequate resources and development of expertise. This can be achieved by the establishment of regional services, where several hospitals/Trusts are served by a single service provider. Dedicated nursing and medical staff, as well as skilled management, should ensure a high quality and responsive service.

NHS Blood and Transplant (NHSBT) provides regional services across England and North Wales from our Specialist Therapeutic Apheresis Units based in; Manchester, Leeds, Liverpool, Sheffield, Oxford and Bristol. The national Specialist Therapeutic Services team offers a portfolio of therapeutic apheresis procedures for both adults and children including ECP. Patient treatments are undertaken in NHSBT therapeutic units or when clinically indicated at the patients bedside. The medical and nursing teams within each unit are highly trained and accredited by, or in compliance with, the requirements of the Medicines Healthcare Regulatory Agency (MHRA), Blood Safety Quality Regulations (BSQR), Human Tissue Authority and Joint Accreditation of ISBT and EBMT (JACIE).

The demand for apheresis procedures from these units is increasing (graph 1 below).



Centralisation of services helps to address important aspects of clinical governance, such as standardisation of clinical practice based on evidence and audit, through regular data collection and analysis. It also facilitates the achievement of relevant accreditations. Surveys by the International Apheresis Registry have shown that not only is apheresis practice variable between centres but collecting meaningful data is difficult. The establishment of a number of regional therapeutic apheresis services within the UK could be the basis for the establishment of a UK wide Therapeutic Apheresis Society or Registry, which would be invaluable to clinical and management decision making. In this particularly highly skilled but low demand health care practice, the regional model of service provision could improve the overall quality and quantity of service to patients.

Dr Khaled El-Ghariani
Consultant Haematologist and Clinical Director
Specialist Therapeutic Services
NHSBT, Sheffield
Email: khaled.el-ghariani@nhsbt.nhs.uk

Catherine Howell
Chief Nurse Patient Services
NHSBT, Oxford
Email: catherine.howell@nhsbt.nhs.uk

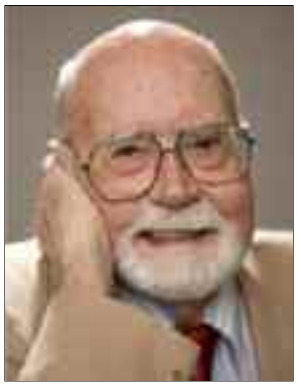
References

El-Ghariani K (2009) Stem cell collection and therapeutic apheresis, in Murphy M & Pamphilon D (eds) *Practical Transfusion Medicine*, WILEY-BLACKWELL

The American Society for Apheresis, Clinical application of therapeutic apheresis: an evidence based approach, *J. Clin Apheresis* (special issue) 5th edition, 2010, **25** (3)

Stegmayr B, Ptak J, Wikstrom B *et al*, (2008) World apheresis registry 2003-2007 data, *Transfusion and Apheresis Science*, **39**, 247-254

Pioneers in Stem Cell Transplantation – E Donnall Thomas



Edwin Donnall ('Don') Thomas was born in 1920, the son of a general practitioner in a small Texas village. His pioneering work in the field of allogeneic stem cell transplantation for leukaemia, severe aplastic anaemia and genetic disease has changed the lives of a great many patients. He attended the University of Texas at Austin where he studied chemistry and chemical engineering graduating with a BA in 1941 and an MA in 1943. Shortly after he entered Harvard Medical School receiving his MD in 1946. He met his wife Dottie at university and she became his partner in every aspect of his life after leaving a career in journalism and training as a laboratory technician. She undertook laboratory work, edited manuscripts and administered grants as well as raising their three children! After Don Thomas graduated in 1947, he completed his residency and internship in Boston where he became interested in normal and malignant haemopoiesis and witnessed the earliest attempts to treat leukaemia with anti-folate drugs. At this time he learned from Leon Jacobsen that shielding the spleen in mice protected them the otherwise lethal effects of irradiation and from Egon Lorenz that a similar radiation protection could be achieved by transfer of bone marrow from an unirradiated mouse.

In 1955 Don Thomas moved to become physician-in-chief at the Mary Imogene Basset Hospital in Cooperstown, New York at the invitation of Dr Joseph Farrebee and started work on marrow transplantation in humans and dogs. Shortly afterwards they published a report showing that, in humans, remission of leukaemia could be achieved by total body irradiation (TBI) followed by infusion of bone marrow from an identical twin. It proved difficult to expand these studies to patients who lacked an identical twin as at that time there was little understanding of the principles of human histocompatibility (HLA typing). Don Thomas said of his time at Cooperstown that "The long cold winters, absence of commuting problems and opportunity for long discussions were conducive to our work. Those years had a deep and abiding influence on subsequent work since most of the basic concepts were laid out during that time."

He continued to concentrate his attention to studies in an outbred canine model, moving to Seattle to become a professor at the University of Washington in 1963, where he developed a system for histocompatibility typing in the dog (DLA typing). By selecting DLA-compatible littermates and using methotrexate post-transplant to suppress graft-versus-host disease (GVHD), bone marrow transplants (BMT) were successful and in the late 1960's he returned to allogeneic transplantation in humans. With financial support from the National Cancer Institute he established a team of doctors, nurses and support staff and the first allogeneic transplant in a patient with leukaemia was carried out in 1969, one year after Dr Robert Good performed the first transplant in a child with immunodeficiency in Minnesota.

In 1975 the team moved to the newly-created Fred Hutchinson Cancer Research Centre (FHCRC) in Seattle when the Seattle Public Health Hospital where they were based was threatened with closure by the federal government. That year they published a paper in the New England Journal of Medicine showing not only that allogeneic BMT was feasible but that there was a plateau on the survival curves indicating that some patients were cured. Don Thomas continued to work at the FHCRC as Head of the Clinical Division until his partial retirement in 1989. Since that time he has been Professor Emeritus at the University of Washington and Director Emeritus of the clinical research division at the Fred Hutchinson Cancer Research Center, where he continues to participate in academic activities.

In 1990 he shared the Nobel Prize in Physiology or Medicine with Joseph E Murray for the development of cell and organ transplantation. *Time* magazine reports the citation for both men by the Nobel committee for their work as "crucial for those tens of thousands of severely ill patients who either can be cured or given a decent life when other treatment methods are without success."

Don Thomas also received the National Medal of Science in 1990, but has always emphasised that his work was part of a team effort involving, amongst others, Dean Buckner, Rainer Storb, Reg Clift, Alex Fefer and Ted Graham together with the nursing and support staff and the transplant patients and their families. Most recently he has been a great advocate for stem cell research – a subject that has become a politically-dominated issue – aiming to clarify the issues for both the public and legislators. He has always believed that stem cell research should be directed by scientists and not politicians, a sentiment with which I agree. Don Thomas' studies dominated the world of stem cell transplantation for decades and his work has always been an inspiration to myself and countless others.

Dr Derwood Pamphilon
Clinical Director Stem Cells and Immunotherapy
Medical Director, British Bone Marrow Registry and NHS Cord Blood Bank
NHSBT, Bristol
Email: derwood.pamphilon@nhsbt.nhs.uk

FURTHER READING

Blume KG, Forman SJ, Appelbaum FR. (2004) E Donnall Thomas. A Tribute. *Thomas' Hematopoietic Cell Transplantation.* Blackwell publishing, Malden, MA, USA

E Donnall Thomas an Autobiography http://nobelprize.org/nobel_prizes/medicine/laureates/1990/thomas-autobio.html

NNDB Tracking the entire world. Entry for E Donnall Thomas at: http://www.nndb.com/people/364/000132965/

E Donnall Thomas Nobel Prize Lecture at: http://nobelprize.org/nobel_prizes/medicine/laureates/1990/thomas-lecture.pdf

The Creation of a National Blood Service in Chile: Benefits of a Cooperation Agreement between NHS Blood and Transplant and The Chilean Health Ministry

Introduction by Steve Morgan, Associate Director International Services, NHSBT.

Patrick Sullivan recently retired as Head of Operations (Specialist Services) after 20 years with NHSBT. In the last 10 of these Patrick spent much of his time supporting blood services in developing countries, in particular Chile. In this article he summarises the impact of the Cooperation Agreement.

The safety of the blood supply in the developed world depends in part on the safety of the blood supply in the developing world. So stated Dr Cristina Martinez, Director of the only regional transfusion centre in Chile at the International Society of Blood Transfusion's Congress in Vancouver, 2002. This still holds true nearly a decade later, and is one of the reasons NHSBT takes its international responsibilities seriously. Dr Martinez shared a platform with the NBS' CEO, the catalyst for a formal cooperation agreement.

In the 1990's, blood services in Chile comprised a large number of small hospital-based blood banks. The amount of blood collected from voluntary donors was insignificant, demand for blood was not met, there were no national standards for Blood Services and Transfusion Medicine, and the service was inefficient.

In 1998, health service officials began discussing plans to create a national service, but six years later progress was minimal. The Minister of Health recognised the potential benefits of establishing a formal relationship with an established national blood service, and in 2005 a co-operation agreement was signed to assist with the development of a national service in Chile. The Agreement covered:

- Assistance with developing a new model for regional blood centres and transfusion medicine units
- Assistance with developing a model for increasing voluntary blood donation
- Training support in Transfusion Medicine, laboratory techniques and management and essential management systems
- Support in the application of a quality management model
- Advice on suitable IT systems.

NHSBT agreed to help Chile create a sustainable national service and develop a national plan in line with World Health Organisation (WHO) and Pan-American Health Organisation (PAHO) requirements. This assistance was provided through a series of visits to Chile by NHSBT experts, including contributions to workshops, as well as visits by leaders from the Chilean blood service to NHSBT blood centres.

The agreement did not include funding. The nature of a truly self-sustaining blood service in any country is for the government to show commitment by making available a sufficient recurring budget. Critically, NHSBT worked with Chile's health funding agency FONASA (Fondo Nacional de Salud) to ensure the costs of existing services were fully understood as well as the recurring costs of proposed plans.

In addition to NHSBT, a network of other organisations contributed to the project including Etablissement Français du Sang (EFS), Blood Transfusion International (BTI) and the International Society of Blood Transfusion (ISBT).

METHODOLOGY AND USE OF A SITUATION ANALYSIS

BTI created a scheme of assessment to enable developing countries to make stepwise, sustainable improvements to their blood services taking account of WHO (World Health Organisation) recommendations for the Minimum Requirements for Blood Transfusion Services. A small number of countries piloted the scheme, including Chile. A critical part of the scheme's methodology is a situation analysis. The first analysis was conducted as part of this project and performed by current and retired NHSBT staff. As a result of the analysis, the newly formed National Commission for Blood developed proposals for consideration by the Chilean Health Minister. Two national workshops were an integral part of this and at the second, the President of the Commission presented the proposals to the Directors of all the country's Health Services.

EDUCATION AND TRAINING

As part of the project, ISBT provided funding to run Chile's 2008/9 Diploma in Transfusion Medicine in conjunction with a University. Organisations in the network contributed expert speakers.

The purpose of the Diploma was to increase knowledge in Transfusion Medicine. The main benefit to Chile has been 35 newly trained specialists, who work mainly in hospitals. This enables them to influence clinical practice through promoting appropriate use, adherence to clinical standards and guidelines for transfusion and by supporting hospital transfusion committees. The training also addressed the advantages of consolidation of blood services, as recommended by WHO.

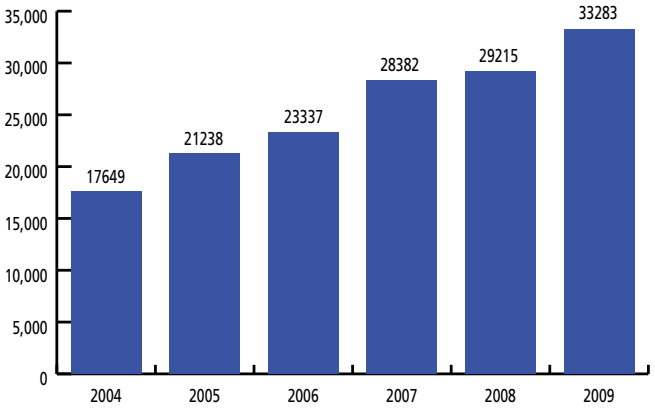
ACHIEVEMENT

The work carried out during the Agreement led to the creation of a committed and engaged group of Chilean experts. As a result, the network has made a significant contribution to the following achievements:

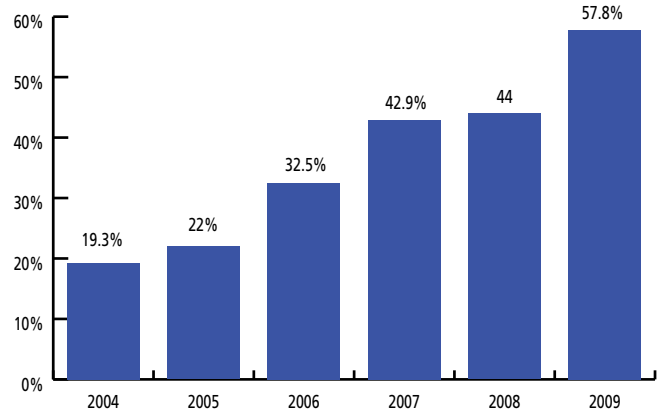
- Creation of the National Commission for Blood
- Development of a national plan based on the gradual consolidation of processing and testing to three regional blood centres
- Sustained increase in voluntary blood donation at mobile clinics in the three centres in Concepción, Valparaiso and Santiago, and the opening of three static clinics or 'Donor Houses'
- Agreement with FONASA for a specific recurring budget for the blood service
- Development of national standards for blood services
- Creation of a Transfusion Medicine handbook
- Participation in external UK and PAHO Quality Assurance schemes
- A successful series of accredited diplomas and courses in Transfusion Medicine resulting in 35 doctors, medical technologists and nurses fully trained as the next generation of specialists to lead Blood Services
- Advice on specifications for IT systems
- Advice on the construction of new regional blood centres.

In 2010, the Director of the Concepción Regional Blood Centre visited NHSBT to further develop plans for a new regional centre and improve her expertise in transfusion medicine by attending the annual UK SHOT Symposium.

Graph showing the increase in total blood donations in Concepción since 2004



Graph showing the increased rate of voluntary blood donations in Concepción since 2004



THE 2010 EARTHQUAKE

Dr. Martinez made a visit to the Regional Hospital where some children needed to be transfused after being seriously injured after the earthquake and tsunami

Part of the training provided under the Agreement included Emergency Planning and Business Continuity. This proved vital in helping the Concepción Centre to recover so quickly following the earthquake which devastated the city on 27th February 2010. During the final visit under the Agreement, a workshop reviewed what could be learned by the Concepción Centre's Management Executive from its response to the earthquake.

BENEFITS TO NHSBT AND THE NHS

These include:

- Contributing to a safer, more sustainable blood supply for patients in developing countries
- Maintaining and enhancing NHSBT's reputation within international blood community
- Contributing to corporate social responsibility and the direct link to three of the Millennium Development Goals
- Blood is a truly international commodity and the NHS benefits from any increase in aggregate safety in the global blood supply
- Personal development for staff
- Learning from the countries we support.

CONCLUSION

These achievements demonstrate that establishing a co-operation agreement with an existing national blood service, as well as having the support of a network of other organisations has provided a successful low cost way to facilitate the development of a sustainable national service and contribute to specific improvements in standards. The emphasis has been on the transfer of knowledge and expertise to leaders of the blood service in Chile.

Patrick Sullivan
Head of Operations (Specialist Services) Retired
Email: patricksullivan18@hotmail.co.uk

Steve Morgan
Associate Director, International Services
NHSBT, Filton, Bristol
Email: steve.morgan@nhsbt.nhs.uk

Please let us know if the mailing address for your copy of Blood and Transplant Matters is not correct contact: **carol.griffin@nhsbt.nhs.uk**

Next Edition

Issue 35 will feature articles on:

- Selection and Allocation of Organs
- Hospital Blood Transfusion Training Passport
- Learn Blood Transfusion – elearning for Safe Transfusion
- HIV Look-Back Audit in England & Wales: 1995-2009
- Significance and Measurement of HLA and their Antibodies
- 'Do you know who I am' Campaign

If you would like to comment on any of the articles in this edition of ***Blood and Transplant Matters*** please email the Editor: derwood.pamphilon@nhsbt.nhs.uk

CPD Questions

Where Do Platelets Go

1. During The Audit Period:

a) Platelet wastage was lower for centres holding stock.

b) Platelet usage was greatest in trauma.

c) Platelet usage for prophylaxis was over 60% of transfusion episodes.

d) Platelets given for prophylaxis with a platelet count of less than 10 x 10^9/L is over 65% of transfusion episodes.

Where Do Platelets Go

2. During The Audit Period:

a) Over 90% of requests had a record of the clinical reason for platelet use.

b) Over 90% of transfusion episodes were followed up with a post transfusion platelet count.

c) Over 25% of the post transfusion platelet count were on the day of transfusion.

d) There was little variation between Trusts.

3. The Donation Chair:

a) Lying flat facilitates regulatory control of blood pressure.

b) Sitting for donation reduces the feeling of vulnerability.

c) All NHSBT requirements met by existing "off the peg" models.

d) Donors prefer the current donation bed over the donation chair.

4. NHSBT Tissue Services:

a) Only provides a Research and Development Service.

b) Deals with all deceased tissue donor referrals for England only.

c) Does not deal with surgical tissue donation.

d) Is the UK's major provider of human tissue for transplant.

5. Common Inherited Disorders for Clotting:

a) Haemophilia A and B and Von Willebrand disease account for over 90% of inherited coagulation factor deficiencies.

b) Haemophilia A is inherited as a dominant trait.

c) Haemophilia B is caused by a deficiency or dysfunction of blood coagulation factor VIII.

d) Von Willebrand disease is caused by a deficiency or dysfunction of blood coagulation factor IX.

6. Common Inherited Disorders for Clotting:

a) Type 2 Von Willebrand disease is the commonest autosomally inherited bleeding disorder.

b) Type 3 Von Willebrand disease is characterised by factor VIII levels less than 10%.

c) Von Willebrand is characterised by recurrent joint or muscle bleeds.

d) Type 1 Von Willebrand is the least common inherited bleeding disorder.

7. Common Inherited Disorders for Clotting:

a) Haemophilia A or B is characterised by mucocutaneous by bleeding.

b) Factor VIII is a serine protease.

c) Factor VIII is a non-enzymatic cofactor of Factor IX.

d) Deficiencies of either Factor VIII or IX result in reduced V ase activity.

8. Haemophilia A

a) Factor VIII factor levels between 5-25% are associated with moderate bleeding.

b) Is an autosomal recessive disorder.

c) Always diagnosed in first year of life.

d) Incidence of approximately 1 in 10,000 births.

Emergency Transfer of Blood

9. Over a three month period in London and the South East, Blood transfused into the patient:

a) Was used for the intended patient in 75%.

b) Was wasted in less than 20%.

c) Was transfused en route in over 20%.

d) Wastage was due to inadequate packing or temperature control.

10. Myalgic Encephalomyelitis and Donor Exclusion

a) A diagnosis of Myalgic Encephalomyelitis results in the permanent exclusion of a blood donor.

b) A diagnosis of Myalgic Encephalomyelitis results in a temporary deferral.

c) A diagnosis of Myalgic Encephalomyelitis does not exclude a blood donor.

d) A diagnosis of Myalgic Encephalomyelitis can be accepted as a blood donor if asymptomatic.

NHSBT The Challenge Ahead

11. The cost of blood is at the same price as in:

a) 2007/08.

b) 2009/10.

c) 2005/06.

d) 2006/07.

12. Optimal Blood Use:

a) Optimal usage of blood is well known from studies.

b) SANGUIS showed no difference in elective orthopaedic surgery outcome despite wide variation of blood usage.

c) TRICC showed critically ill patients cannot be harmed by transfusion.

d) SHOT was the first Haemovigilance programme.

13. SHOT:

a) Is funded by the EU Commission.

b) Is part of the Department of Health.

c) Reports to MHRA.

d) Has produced 13 annual reports.

14. Update of vCJD since 2008 – there are

a) 1 to 3

b) 4 to 7

c) 8 to 12

d) 12 to 15

reported cases each year.

15. Update of vCJD

a) Prion reduction devices offer a potential of a 5 to 6 log reduction in infectivity of blood components.

b) vCJD transmissions from known infected donors has not been demonstrated.

c) Last documented case of vCJD transmission of vCJD from an infected donor was reported in 2007.

d) Leucodepletion is effective at removing the risk of transmission.

The CPD Section is a self-assessment exercise which allows readers to evaluate their understanding of each article. The answers are to be found within the articles themselves. Most CPD schemes allow this type of exercise to be eligible for credits as self-directed learning.

Diary Dates 2011

21-22 September 2011
The St Mary's Two-Day Course in Advanced Haematology Morphology
Location: Hammersmith Hospital
For more information contact: www.bsh.org.uk

22-25 September 2011
ESH-iCMLf Conference, Chromic Myeloid Leukaemia – Biology and Therapy
Location: Estoril Congress Centre, Estoril, Portugal
For more information contact: www.esh.org

23-24 September 2011
9th ASH State-of-the-Art Symposium (SAS)
Location: Palmer House Hilton, Chicago, USA
Details: This year's program will focus on new developments in the treatment, diagnosis and management of hematologic malignancies, with a focus on plasma cell disorders.
For more information contact:
www.hematology.org/sas

6 October 2011
Induced Pluripotent Stem Cells: Production and Utility in Regenerative Medicine
Location: The Penridge Suite, London
For more information contact: www.bhs.org.uk

14-16 October 2011
ESH-EHA Scientific Workshop, Acute Myeloid Leukaemia – 'Molecular'
Location: Pullman Mandelieu Royal Hotel, Mandelieu, La Napoute, France
For more information contact: www.esh.org

22-25 October 2011
AABB Annual Meeting and CTTXPO 2011
Location: San Diego, California, USA
Details: Learn the latest in blood banking, transfusion medicine and cellular and related biological therapies.
For more information contact:
www.aabb.org/annualmeeting

27-29 October 2011
ESH Eurocord – Ed Netcord EBMT World Cord Blood Congress III
Location: Hotel Nazionale Rome, Rome, Italy
For more information contact: www.esh.org

7-9 November 2011
ESH-ISTH Advanced Course in Thrombosis and Hemostasis
Location: Hotel Quinta da Marinha Resort, Cascais, Portugal
For more information contact: www.esh.org

11-12 November 2011
ESH-EHA Type I Tutorial Focus on MDS
Location: Diplomat Hotel, Prague, Czech Republic
For more information contact: www.esh.org

17 November 2011
NEQAS (UK) BTLP and BBTS Blood Technology Joint Meeting
Venue: Birmingham Motorcycle Museum
For more information contact: www.bbts.org.uk

20-23 November 2011
XXIInd Regional Congress of the ISBT, Asia
Location: Nangang Exhibition Hall, TAITRA, Taipei, Taiwan
For more information contact: www.isbt.web.org

23 November 2011
Current Treatment Options in Haematological Malignancy and Support Therapy
Location: Hilton Newport Hotel, Langstone, Newport
For more information contact: www.bbts.org

10-13 December 2011
53rd ASH Annual Meeting and Exposition
Location: San Diego, CA, USA
For more information contact:
www.hematology.org/meetings/annual-meeting

2012

9-10 February 2012
ESH Updates in Clinical Hematology
Location: Hotel Pullman Paris Bercy, Paris, France
For more information contact: www.esh.org

16-18 April 2012
BSH 52nd Annual Scientific Meeting
Location: SECC, Glasgow
For more information contact:
sarah.lapsley@bshconferences.co.uk

7-12 July 2012
32nd International Congress of the ISBT
Location: Cancun, Mexico
For more information contact: www.isbtweb.org

Blood and Transplant Matters is prepared
and issued by NHS Blood and Transplant,
Oak House, Reeds Crescent, Watford, Herts WD24 4QN
(Telephone 0117 921 7414)