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contact: blood&transplantmatters@nhsbt.nhs.uk

Next Edition

Issue 45 will feature articles on:

- Rare Donors – Wellcome Trust
- St John’s Organ Donation – Dale Gardiner
- UK Cell Salvage – Brian Hockley
- Regional Road Map for Therapeutic Apheresis Services in the North West – Catherine Howell/Dr K Pendry.

If you would like to comment on any of the articles in this edition of Blood and Transplant Matters please email the Editor: robert.webster@nhsbt.nhs.uk
I hope that the last edition of Blood and Transplant Matters was well received and welcome to Issue 44.

1996 became an important year for UK Transfusion Services – as that is the year from which the risk of acquiring variant Creutzfeldt–Jakob disease (vCJD) from meat in the UK was of very low risk – and this cohort has now reached ‘donor’ age. Andrew Broderick outlines the work that has been undertaken to utilize those donations to best advantage. Clinical Audit continues to provide useful information in actual Use of Blood Components and Brian Hockley reports a Regional Audit in the Use of Fresh Frozen Plasma and makes useful recommendations.

Many provide health care at a distance from any actual patient. Often this may result in forgetting the reason for all the quality initiatives, regulation and means that the true reason for all the paperwork and rules, are lost. Marie Collinson-Wallace provides a very moving reason why all that matters and, gives a real meaning to all health related effort. Part of that work is to ensure that we all work as efficiently as possible and reduce waste. Two articles demonstrate how such a drive for efficiency has occurred. The first by Frances Sear and Deborah Asher outlines how a whole region changed the way pathology was delivered and, in particular, the effect upon hospital-based transfusion. The second by Emily Turner covers the approach the NHSBT has taken. The theme of change continues with the articles by Andy Miller, Kairen Coffey, Chris Elding.

Andy Miller outlines the Changes in Scientific Careers and Training within the NHS as a whole, Kairen Coffey covers the provision been made for further Development of Transfusion Practitioners in England and Chris Elding describes how NHSBT has changed the Leadership of our Blood Donation Teams.

Matching the right blood or organ to the patient has always provided some challenges. Rekha Anand and Theo Clarke describe how Community Led Initiatives, Organisation and International Collaboration have improved the supply of rare blood types. Whilst Sue Davey outlines technical advances that will help improve Stem Cell Transplant outcomes.

Dale Gardiner has produced a very interesting article looking at the potential effect of the words and phrases that we use, that may affect the supply of donor organs.

Finally, Rajeev Desai presents some work that may help improve the supply of organs, even when the donor has a history of cancer.

As always, there are both CPD questions – with answers appearing in the next edition – and a case complete with outlined suggested answers, which I hope are both interesting and informative.

Have a happy read. Any comments should be sent to myself or my hard working Editorial Assistant Lynne Hodkin at blood&transplantmatters@nhsbt.nhs.uk.

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Using Blood and Blood Components from the Post 1996 Birth Cohort as a vCJD Risk Reduction Measure

Variant Creutzfeldt-Jakob disease (vCJD) risk reduction has been a key factor in UK blood safety policy, since the late 1990s. UK blood services, the Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) and UK health departments, have continued to advocate and support a range of specific interventions as the principal means of reducing secondary vCJD transmission. Primarily the interventions have required alternative processes to be established, which reduce the potential risk of prion transmission, or the sourcing of alternative supplies of particular blood components and products.

It is widely accepted that since 1st January 1996, interventions aimed at eliminating Specified Risk Materials from the food chain have been effective by reducing the risk of the primary source of infection, that is, no further consumption of contaminated meat or meat products.

It has been suggested that those born on or after 1st January 1996 will have an associated minimal risk of exposure to Bovine Spongiform Encephalopathy (BSE) infected meat and, consequently, have an equally minimised risk of vCJD.

UK blood services are currently engaged in an exercise to explore whether this population group has the potential to provide a source of blood and blood components which are equal to or, safer with respect to vCJD, than the current provision of UK and imported material. Developing such a cohort of donors as a further vCJD risk reduction method could, potentially, provide a cost-effective supply which could be considered as an additional or, potentially for some groups, a substitute for existing safety measures.

On 1st January 2013 the first of the post ‘96 birth cohort became eligible to donate. These donors, if all other donation criteria is met will be able to donate either whole blood or components by apheresis. This would enable the collection of the whole portfolio of currently supplied components – red cell concentrates, pooled platelets, cryoprecipitate, FFP and apheresis platelets.

This situation means that some blood components of UK origin, which are currently assumed to be of minimal risk of prion transmission, are now available and could, subject to further evidence, be progressively given to certain patient groups.

In collaboration with the Health Protection Analytical Team at the Department of Health, modelling work has been undertaken to determine the UK blood services’ potential supply of blood and blood components from this group, potential timeframes at which specific patient groups could be solely supplied with blood components from the post ‘96 cohort and, the various factors which influence such modelling. The modelling determines that patient groups with a small demand for blood components, such as neonatal and intra-uterine transfusions, could be wholly supplied from this cohort within months of any decision to initiate operational roll out of the project. Other groups, such as the general adult population would require up to 20 years before full demand could be met from this cohort. (DH HPAT 2013)

A risk assessment was undertaken to establish whether the cohort of donors could potentially pose any alternate risks to recipients. The assessment identified that the risk of transmitting Epstein-Barr Virus (EBV), Cytomegalovirus (CMV) and/or Parvovirus B19 (B19V) may be increased from this cohort as there is some evidence suggestive of a rapid increase in person to person transmission of these viruses amongst people aged 17-20 years of age. A joint Public Health England (PHE) and NHS Blood and Transplant study was commissioned to establish the prevalence of active infection in this age window, could have the potential to pose an increased CMV and EBV risk to susceptible recipients.

The findings of Phase 1 of the study which reported in June 2014, demonstrated that there is no difference in the prevalence of EBV, CMV and B19 viraemia between the study and control groups. Phase 2 of the study reported in October 2014, was to determine the rate of seroconversion of each of the viruses in the study group. The study identified a high seroconversion rate in previously CMV, EBV and B19 sero-negative donors from the 17 year old donor cohort using samples drawn at their first donation. A control group was established using a random selection of donors from the general blood donor population.

The findings of the study will be presented to SaBTO in December 2014. The committee will be asked whether or not it considers that blood and blood components from the post 1996 birth cohort, pose an additional risk to recipients and, if so, to consider how to direct donations from this cohort in the future.

However, regardless of the SaBTO decision, it will not be possible to implement operational roll out of any targeted
use of post ‘96 birth cohort donations, until an ongoing PHE led study of the prevalence of abnormal prion protein (deemed indicative of vCJD infection) in appendices removed from people born on or after January 1996 is completed and reported in early 2016. The study, which is also examining appendices removed prior to 1980, aims to establish whether prion accumulation is evident in either of these presumed negative groups. The absence of prions in the appendices of the post ‘96 birth cohort would be likely to lead to confirmation that the cohort represent a potential source of blood and blood components with an equivalent or lower risk of vCJD transmission, than those currently used.

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Reference:  
2013.

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Audit of the Use of Fresh Frozen Plasma (FFP) in the East Midlands Region

Introduction

Fresh Frozen Plasma (FFP) may be associated with high rates of inappropriate transfusion with some studies indicating rates of up to 50 per cent non-compliance with established guidelines. The current British Committee for Standards in Haematology (BCSH) guidelines on the use of FFP aim to reinforce the message regarding avoidance of its inappropriate use.

An audit of FFP use in 2007 in the South Central region, revealed that FFP was used for warfarin reversal in 26 per cent of the cases audited. FFP weight related dosage was poorly implemented with weight being recorded in only 32 per cent of cases. The 2009 National Comparative Audit (NCA) programme indicated that FFP continued to be used for warfarin reversal and, was frequently given where there was no evidence of actual bleeding. An audit of FFP use in the South West in one large hospital, found that following a period of intensive educational measures, appropriate use of FFP improved dramatically, particularly with respect to use for warfarin reversal. An earlier East Midlands (EM) regional audit into FFP use, demonstrated that there was continued use of FFP for warfarin reversal, under dosing with poor weight recording and transfusion of FFP, with normal pre-transfusion coagulation continued.

Following a meeting of the East Midlands Regional Transfusion Committee (RTC), it was decided to repeat an audit of FFP use across all hospitals in the region.

Methods

Regional Transfusion Practitioners elected to undertake the data collection using a hard copy data collection form. Approval to participate in the audit was obtained and Caldicott Guardians informed. Details of FFP use for a total of 20 cases were collected per site. Completed forms were returned to the RTC data analyst and audit facilitator. Information was manually entered into an Excel spreadsheet and analysed proportionately (n, per cent). Data anomalies were discussed at a subsequent RTC meeting, before final analysis.

Results

Organisational Survey

Fourteen hospitals (eight Trusts) make up East Midlands RTC with one independent site. Nine sites responded to the organisational questionnaire. Of these:
- Eight/Nine had an FFP use policy for all areas (including paediatrics). One site had a policy for adults only.
- Nine/Nine had a policy for over-coagulation with Warfarin.

Eight organisations who responded, used FFP variants for children under the age of 16 years.

Clinical Findings

Audit Standards

1. FFP should be used in appropriate situations as defined by BCSH guidelines.
2. FFP dosage should be based on the weight of the patient.
3. Coagulation screening should be performed pre- and post-transfusion.

Principle Findings

- 100 per cent of organisations had policy documents in relation to FFP transfusion.
- The average age (52 years) of FFP recipients, is less than in previous audits.
• The principal reasons for FFP use were massive bleeding, cardiac surgery and liver disease.
• Recording of volume of FFP transfused and, recording of consent to transfusion, may have room for improvement. Units were recorded as both “mls” and “number of units”.
• Use of idiosyncratic notation (dot) to denote “unit”.
• Pre transfusion coagulation data was present in a maximum of 98 per cent of patients (INR, APTT or PT). Post transfusion coagulation data were present in a maximum of 62 per cent of patients (INR, APTT, or PT).
• There was a low level use of thromboelastography. Where thromboelastography was used, results often reported as “normal” rather than actual values being shown.
• Post transfusion coagulation results (<3 hours) were completed in 37 per cent of cases. Overall post transfusion coagulation tests were completed in 62 per cent of cases.
• The benefits of FFP were documented in 21 per cent of cases.
• There is a wide range of laboratory reference ranges used across the region.
• In 46 per cent of cases, FFP was transfused in the absence of any bleeding. The NCA in 2009 reported this figure as 43 per cent, indicating no improvement in clinical practice.
• FFP continues to be used where there is little or no evidence of abnormal coagulation (over 30 per cent of cases). These figures have not changed substantially since the NCA in 2009.
• There has been a substantial reduction in the use of FFP for warfarin reversal, compared with the NCA FFP audit (14 per cent to 3 per cent).
• Ten patients with evidence of liver disease, did not receive vitamin K.
• FFP is underdosed and, does not appear to be used in relation to the weight of the patient, in a large proportion of the cases (Figure 4). There is also evidence of overdosing in some patients.
• No adverse effects were documented.

**Figure 4: Relationship Between Weight and Volume of FFP Transfused in Bleeding Patients.**

![Graph showing relationship between weight and volume of FFP transfused in bleeding patients.](image)

**Recommendations**

• Hospitals should have locally agreed, speciality specific, guidelines for the use of FFP. As a minimum, specific local guidelines should address the use of FFP in liver patients, cardiac surgery, trauma, Intensive Care Units and Neonatal Units. These guidelines should define appropriate dose (mls/Kg) of FFP.
• Hospitals should have local guidelines on the reversal of anticoagulation with warfarin and other vitamin K antagonists. This guideline, should clearly define exceptions where the use of FFP may be appropriate in addition to vitamin K, when Prothrombin Complex Concentrates (PCCs) are contra-indicated.
• Clinicians who prescribe FFP should be familiar with the guidelines for their specialty.
• Each high user clinical specialty, should perform regular (annual) audits of compliance with local guidelines. The audit findings and action plans should be disseminated to all clinicians within the specialty and, presented to the Hospital Transfusion Committee.
• Use of FFP for the treatment of bleeding should be guided, wherever possible, by appropriate laboratory or ‘point of care’ tests of coagulation before and after transfusing FFP.
• The East Midlands Regional Transfusion Committee, in collaboration with Hospital Transfusion Teams, should organise regional and local educational events, on evidence-based use of FFP.

A full copy of this audit can be obtained from:

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**Glossary**

APTT = Activated Partial Thromboplastin Time
INR = International Normalised Ratio
PT = Prothrombin Time
Acknowledgements:

Hospital Transfusion Practitioners, EM RTC Region for completing and submitting the data.

References:


South Central Regional audit of FFP. http://www.transfusionguidelines.org.uk/uk-transfusion-committees/regional-transfusion-committees

South West Regional audit of FFP. http://www.transfusionguidelines.org.uk/uk-transfusion-committees/regional-transfusion-committees

East Midlands regional audit of FFP. http://www.transfusionguidelines.org.uk/uk-transfusion-committees/regional-transfusion-committees

Olivia’s Story

My daughter Olivia was born on 19th May 2000. She grew into a happy, loving toddler. However, in January 2003 and following no apparent symptoms, our very astute General Practitioner had a suspicion Olivia was ailing. We were immediately referred to the Sheffield Children’s Hospital, where Olivia was diagnosed with Acute Lymphoblastic Leukaemia. This shocking news came exactly two days after I had found out I was pregnant with my third child.

Olivia’s consultant at the Sheffield Children’s Hospital explained to us, that children respond to treatment in different ways. The effects of the chemotherapy could put her life at risk.

On Olivia’s first night on ward M3, which was to become our home for almost three years, Olivia received her first blood transfusion to prepare her for surgery the following day. The result of that transfusion was a transformed little girl! However, that was to be the last time for many months that we saw her sparkle. That morning Olivia was taken to theatre and the first of numerous surgical procedures began.

Three weeks later, following an adverse reaction to chemotherapy, Olivia suffered a stroke affecting her left side. Treatment was halted to allow Olivia’s gradual recovery from the stroke. Unfortunately, this break in treatment allowed the ‘rogue cancerous cells’ to take control again. We were totally unaware at this stage that this was to be the first of many setbacks yet to come.

Treatment was supposed to take around two years, in blocks of three to four weeks. However, after three and a half months, due to the stroke and other complications, Olivia had yet to complete a single block of treatment. What kept her going was the seemingly endless supply of blood and blood components.

After about five months, Olivia had made enough of a recovery from the stroke to be declared fit for a second attempt of treatment. This was to be the start of the most harrowing, painful and helpless time of my life.

Within the first week of treatment Olivia became dangerously ill with septicaemia, and the treatment for leukaemia had to be abandoned once more. She was moved to an isolation unit within intensive care. She was ventilated, and on full life support. Her life was hanging by a thread, and we were told to prepare for the worst. With family close by, we kept a painful bedside vigil.

Doctors suspected Olivia had suffered a second stroke. The septicaemia meant that there was a serious possibility that some of her limbs would have to be amputated. She was also at high risk of pneumonia. Olivia was hanging on thanks to life support machines and, of course, donated blood, platelets and other blood components.

With devoted medical support, Olivia made it through. She finally left the Intensive Care Unit and returned to ward M3, in time for her brother Russell’s 10th birthday party, which was held at Olivia’s bedside.

Olivia had still not completed the first block of treatment for her leukaemia. Before the next attempt began, it was decided to let us have some ‘time out’ away from hospital. I was eight months into a difficult pregnancy, and we were all physically, mentally and emotionally exhausted.

Despite this we were determined to have some fun. Train rides, seaside visits, picnics in the woods and the park - all the things Olivia had missed were planned, and some were even happening, until she fell off the garden swing and broke her leg.

Olivia being Olivia, she just ’got on with it’! She adapted her mobility technique and, with the help of a little wooden
bike she zipped around the house and garden not at all hampered by the tubes, pipes and the plaster cast on her leg.

But only too soon the time came to return to the hospital. I often thought it quite ironic that the very drugs within the chemotherapy that were to cure Olivia of Leukaemia had so far put her life at risk on many occasions.

So, we moved back into our flat at the hospital, Olivia back onto Ward M3, and with that … the next crisis.

Olivia’s unborn sister was due on 28th September. Aware of this and wanting to get Olivia through the ‘worst part of the treatment block’ before the birth, it was decided to start Olivia’s treatment again, so she went into isolation to prepare. This was still the first block of unfinished treatment outstanding from the original diagnosis, almost nine months earlier.

Olivia’s treatment was delayed again, whilst I gave birth to her new sister. So, more blood and component transfusions were given to Olivia, to maintain her health.

Olivia continued to suffer infections, which meant further long spells in hospital and in isolation. During her treatment, which finally ended on April 14th 2006 she received numerous units of red blood cells, fresh frozen plasma, albumin, and many units of platelets.

Ward M3 at the Sheffield Children’s Hospital is just for the care of paediatric cancer patients. Olivia spent many hours in the school classroom on the ward, a place to make many new friends. Sadly not all of Olivia’s friends won their battle against their cancer, and it was another low point when Olivia’s friend and playmate, Emily, lost her brave battle against a solid tumour.

Olivia now lives life to the full and she’s a typical teenager. She loves school, shopping and socialising with her friends. She is a Young Ambassador for NHSBT often accompanying me as a guest speaker at NHS events.

Olivia still has, and always will have, regular hospital visits as there is always a risk a rogue cell will ‘blast back through’. She is closely monitored to watch for any undiscovered damage that her prolonged exposure to chemotherapy may have caused.

As a grateful parent to Olivia, a colleague to some of you reading my story, and on behalf of all of Olivia’s family and friends, thank you very much for the work you do and the ongoing progress being made.

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The Changing Face of Pathology Services and How this is Impacting on Blood Management

Background

In 2008 the Carter Report made recommendations for the transformation of pathology services, to allow for system reform and response to the challenges within the NHS. Following on from this, in 2010, the Transforming Pathology project commenced in the East of England with all 17 Trusts in the region taking part in the initial bidding process. As of 1st October 2014 there are three pathology networks within the East of England involving 12 of the Trusts: Eastern Pathology Alliance (EPA), The Pathology Partnership (tPP) and Pathology First.

The Network Model

The first network to start operating was EPA, commencing on 1st February 2014. It consists of a model of one large hospital acting as a hub laboratory, performing a full test repertoire, and two smaller hospitals being spokes. These laboratories only perform ‘hot blood science’ tests but maintain full on site transfusion laboratories.

There are a number of network posts which support transfusion: the Network Pathology Manager, Blood Science Manager, Quality Manager and Training Manager. Dedicated transfusion staff then include: the Network Transfusion Manager at band 8a and the Network Transfusion Quality Lead, Transfusion Leads at each spoke and two Transfusion Seniors at the Hub, at band 7. To cover 24 hour shifts seven days a week in haematology/transfusion there are 15 BMS Band 5/6 staff at the hub and seven BMS Band 5/6 staff at each spoke. Support staff are also employed and the role of the Associate Practitioner is being developed across EPA.

In the future it is envisaged that all Band 5/6 staff at the spokes will be multidisciplinary. However, the transition to this new model has been hampered by the lack of central funding for the transition, high staff turnover and the inability to recruit to Band 6 positions. There are currently five locums supporting transfusion/haematology across EPA.

Standardisation of equipment and procedures is progressing but there are no current plans to move to a common Laboratory Information Management System (LIMS). Rotation of staff between hub and spoke laboratories may be possible in the future once there is more standardisation.

Transfusion Services Under EPA

Blood transfusion workload within each hospital remains broadly as it was before transformation, although there has been some movement of antenatal testing. There has been standardisation of blood grouping analysers and technology as part of the EPA project, with all three sites now using Immucor Neo analysers. Laboratory and blood transfusion services are provided to the hospitals under terms laid out in a negotiated Service Level Agreement (SLA). Key Performance Indicators (KPIs) form part of the SLA with the three Trusts monitoring EPA’s performance and EPA monitoring the Trust’s performance. KPIs include:

- per cent Platelet wastage;
- per cent Red cell wastage;
- per cent O negative issues;
- traceability rates;
- number and type of SABRE reportable incidents;
- mandatory training per cent for Trust clinical staff.

At the hub, cross charging for blood components has been in place for over a decade: data is broken down by component, directorate and financial value and fed back to the Trust via the Hospital Transfusion Committee (HTC). This has been useful and ideally should be in place across EPA.

All three Hospital Transfusion Teams (HTTs) continue to meet and function as they did prior to transformation; however the Transfusion Practitioners, Consultant Haematologists and administration staff are now employed by different Trusts. The Network Transfusion Manager is the link to try and rationalise/standardise transfusion services where practicable.

Laboratory staff continue to try and provide quality management tasks that impact usage including:

- Monitoring Quality Indicators and highlighting issues to senior staff.
- Performing audit.
- Challenging inappropriate requests.
- Effective stock management and ordering.
- Timely management of de-reservation times.

Effects of Transformation on the Service

The changes involved with the network formation, affected the numbers and skill mix of staff available and, led to a massive training burden. The transition process, along with vacancies and an increase in workload, led to less staff being available to perform effective quality management tasks. Due to the long period of uncertainty leading up to the transition and the impact of that on staff morale and motivation and, the loss of staff in key
positions, one of the spoke laboratories had its CPA accreditation suspended and was placed under the MHRA’s competence management team. Following much hard work, CPA inspectors have now recommended re-accreditation of this laboratory. A re-inspection by MHRA is expected in the next six weeks. This demonstrates the need for awareness by other networks in development of effective operational and quality management, in the lead-up to and during the transition process.

**Effects on Blood Component Usage and Wastage**

The changes from the transition process and to staffing levels/skill mix had the potential to impact on blood/component use, by affecting the opportunity to manage this effectively. No formal audit or data collection has been conducted to compare the effect of transformation on blood use. However, utilising the usage and wastage data collated by EPA and that available through the Blood Stocks Management Scheme (BSMS) the following impact can be seen:

**Hub;**
- Red cell issues – slight drop.
- O negative percentage issues – no significant change.
- Platelet issues – no significant change.
- Red cell wastage – slight increase, now returned to pre-transformation levels.
- Platelet wastage – increase.

**Spoke 1**
- Red cell issues – slight increase.
- O negative percentage issues – slight increase.
- Platelet issues – increase.
- Red cell wastage – slight decrease.
- Platelet wastage – decrease.

**Spoke 2**
- Red cell issues – No significant change.
- O negative percentage issues – No significant change.
- Platelet issues – Decrease.
- Red cell wastage – slight increase last quarter.
- Platelet wastage – slight initial increase, now returned to pre-transformation levels.

The hub laboratory, which saw the largest increase in workload, showed a slight increase in wastage, although this has now reduced for red cells. One spoke site had significant staffing and regulatory issues, however, demonstrated a drop in wastage of components. The other spoke laboratory has shown stable usage of components, but wastage has slightly increased.

The wastage throughout EPA remains low despite the changes and problems. Close regular monitoring, with feedback, could be a factor in this.

As no formal audit has been performed, conclusions as to the reasons for any changes in usage and wastage cannot be made. However, anecdotally, it is felt that time-pressures on staff, have meant that pro-active stock monitoring and management suffered, particularly in the initial stages of transition.

**Moving Forward**

Moving towards a hub and spoke model should bring about opportunities to improve blood component usage and wastage by adopting best practise from each Trust and moving stock around the network to minimise waste. This has not yet been realised, as the impacts of the changes that transition has brought, have still to be resolved and new working relationships cemented. The most pressing ongoing issues are staff training and continued maintenance of the Quality Management System whilst maintaining an operational service.

The lack of time for audit means a lack of opportunity to identify areas for improvement of practice, reduction in inappropriate usage and wastage and the costs involved.

A number of lessons can be learned from the EPA network’s formative process to facilitate future pathology transformation and, its potential impact on blood component usage. Learning points include the need for:

- A well-planned, managed and funded transition period. Proper project management resource and, adequate transitional resource, is essential.
- Adequate staffing with appropriate skill mix and knowledge-base in every discipline to meet both operational and regulatory requirements.
- Common IT, equipment, policies and procedures make for an easier transformation, if feasible.
- Adequate time and resource for staff training – these should not be underestimated.
- Adequate, protected time to dedicate to maintaining a robust QMS.
- Use of KPIs for monitoring blood component usage and wastage.
- Maintenance of good working relationships within the HTT, despite having different employers.
- Maintaining excellent communication channels between network laboratory staff and Trust clinicians.
- Audit and monitoring the effect of the transformation process.
- Identifying areas of strength or need for improvement within the network.
Organisation and Workforce Development Modernising Scientific Careers (MSC)

**Why is Modernising Scientific Careers Necessary?**

As a workforce, the “scientists” have been overlooked by the National Health Service (NHS) for many years. Although over 45,000 scientists only make up around 3.5 per cent of the NHS workforce, they are involved in 80 per cent of patient pathways within the Service. Many scientific staff find themselves in enjoyable and challenging positions within Trusts, but they have no career development or structure, should they wish to advance. There are many dead-end jobs, no senior positions or difficulties in training- up the next generation of scientists, especially in the smaller disciplines. MSC encompasses all scientific staff, be they Biomedical Scientists (BMS), Clinical Scientists (CS) or Medical Photographers, Physicists and Engineers.

After tackling medical careers (Modernising Medical Careers) and nursing careers (Modernising Nursing Careers) the NHS turned its attention to the scientific workforce.

**What is Modernising Scientific Careers?**

MSC is a training and education strategy which supports a new career structure for all scientific staff within the NHS. MSC consists of four levels of training: Apprenticeships, BSc, MSc and doctorate-level.

As none of the traditional role descriptors, job titles or person specifications proved acceptable to adopt for all scientific staff, it was decided to form new titles: Healthcare Assistants, Associates, Practitioners, Scientists and Consultant Healthcare Scientists. MSC covers the scientific workforce from Agenda for Change Band 2 up to Band 8+/9.
Trusts are currently redefining their scientific workforces in the NHS Electronic Staff Record (ESR) – the so-called transition from “U” to “T” Occupational Codes. In the future, Health Education England (HEE), which now holds the entire (£5+ billion) NHS Training Budget, will base their allocation of funding on the ESR coding.

**Benefits**

All NHS scientists will have a complete career structure from bottom to top, and the training and education structure to realise their development / career aspirations.

The development of new roles for scientists, especially at the upper and lower end of the framework, to support their nursing and medical colleagues.

A far more mobile, responsive workforce which can react to changes in technology and medicine to drive innovative methods for patient care.

**Challenges**

None of the career / staff structures within Trusts perfectly match the MSC career structure therefore departments need to adjust their workforce descriptors onto the new framework. Departments will need to profile their scientific workforce through the work done in the department (and which grades of staff do that work) – this can be done using the NHS Workforce Profiling Tools outlined on the NHS Employers website.

**MSC Training Programmes**

The NHS has, and is currently devising and revising, programmes and curricula through the National School of Healthcare Science (NSHCS) to replace the myriad of university courses traditionally used to educate the scientific workforce. As NHS scientists undertake the MSC training programmes many of the university courses are no longer economically viable and cease to run. The timescale for this is unknown but, courses are now starting to be withdrawn. These courses are being replaced by the following national programmes:

**Apprenticeships:**

These are currently being developed for Assistant and Associate level scientific staff.

**Practitioner Training Programme (PTP):**

Five national BSc curricula delivered by a variety of universities. All transfusion-associated scientists would study the Pathology Sciences course. The aim of these programmes is to develop standard scientific staff who can work in a wide variety of NHS laboratories and departments. The PTP process is currently under revision by the NSHCS.

Applying to the PTP programme is done through the universities running those programmes – applications run on the normal academic year.

**Scientist Training Programme (STP):**

A range of MSc curricula aimed at developing more senior scientific roles. These positions are totally funded by HEE and the programmes are based on the medical Specialist Registrar (SpR) rotational mode of delivery, where students spend most of their time learning and practicing in industry. Trusts apply to host these positions, and potential students apply for these positions through a national process through the NSHCS.

Applying to the STP programme is a national process and begins in January of each year.

**Higher Specialist Scientific Training (HSST):**

This is a five-year workplace-based training programme, supported by an underpinning doctoral-level academic programme and, where appropriate, Royal College qualifications. Curricula are being developed to develop top-level scientists (not managers) and the training is equivalent to the current SpR training model.

**Funding**

HEE will preferentially fund training requirements for scientists based on the MSC framework, not the traditional framework.

**Benefits**

For the first time, scientific departments can design training resources for a “standardised” graduate (BSc) entry-level scientist, as they will all be trained to the same curriculum. This will facilitate co-operation on a national basis to develop high quality resources which can be used by Trusts and NHS Blood and Transplant services.

The graduate scientific workforce will be far more mobile, with the ability to work in a far larger variety of laboratory environments. This will drive-up employment standards for scientists, as departments attempt to keep their good staff, as well as making appointments in smaller departments easier.

Where gaps in programmes are identified the NSHCS will work with industry experts to develop suitable high-quality solutions.

**Challenges**

One-size does not fit all requirements; some specialised (and often small) but vital roles are not currently addressed by the training structures in the framework. Tissue Services and Stem Cell Technologies are such examples. HEE will continue to fund the traditional routes for qualifications in
these areas but departments need to prove that no MSC programmes are suitable for these roles. This can be a time-consuming task.

To host an STP position departments must build up their networks to cover parts of the curricula which cannot be completed in-house. The curricula are designed such that the student will need to have periods of time within other departments or Trusts. Sharing trainees or coming to agreements about what training will be delivered and where, together with what those other departments/Trusts will get in return, need to be developed.

The Academy of Healthcare Science

The Academy for Healthcare Science is the overarching body for the whole of the Healthcare Science Profession, working alongside the specialist professional societies. They work to ensure that Healthcare Science is recognised and respected as one of the key clinical professions in the health and care system, including working towards statutory regulation of all scientific staff groups to ensure protection for the patients they serve.

The Academy holds the (currently) voluntary Register\(^3\) (like the Health and Care Professions Council Register) for smaller disciplines and scientists at Practitioner level. They also coordinate the Equivalence\(^4\) process for scientists who wish to be included onto the MSC framework without undertaking one of the training programmes.

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Useful Links:
Training Programmes: http://www.nhscareers.nhs.uk
Assistant\(^5\), PTP\(^6\), STP\(^7\) and HSST\(^8\) at NHS Careers
http://www.nshcs.org.uk/
National School of Healthcare Science
http://hee.nhs.uk/
Health Education England
http://www.ahcs.ac.uk/
The Academy of Healthcare Science

Medical Training

This edition was to include a section on medical training but this is currently undergoing a review. We will report on the results of that review in the Spring or Summer Edition.

\(^1\) http://www.nhsemployers.org/your-workforce/plan/healthcare-science-workforce/esr-and-the-healthcare-science-workforce
\(^2\) http://www.nhsemployers.org/case-studies-and-resources/2014/04/workforce-planning-tools
\(^3\) http://www.ahcs.ac.uk/the-register/
\(^4\) http://www.ahcs.ac.uk/equivalence/
\(^6\) http://www.nhseducation.nhs.uk/explore-by-career/healthcare-science/education-and-training/nhs-higher-specialist-scientific-training-(hsst)/

Leadership Development for Transfusion Practitioners in England

Background

The National Health Service (NHS) is undergoing a period of significant transformation, resulting in new challenges for everybody involved in healthcare. It is therefore, essential that staff have the knowledge, skills and behaviour to drive forward clinical excellence and promote improved patient care. This cannot be done without the development of core leadership skills.

In 2010 a National Survey of Transfusion Practitioners (TP) was conducted as a collaboration between NHS Blood and Transplant (NHSBT) and the National Blood Transfusion Committee (NBTC). The aim was to obtain an accurate picture of the TP role from their perspective and, identify factors which promote role effectiveness, including analysis of job satisfaction. The results varied but there was a common theme that emerged in that the TPs wanted to be professionally developed.
“Almost a third of TPs did not feel supported by their hospital management or in a professional capacity. 68 per cent said the role had changed significantly since they had been in post, 71 per cent wanted ‘better educational activities’ and 68 per cent required ‘better career opportunities’”.

National Survey of Transfusion Practitioners (2010)

One recommendation of the survey, was the promotion of personal and professional development for TPs. Further exploration of the TP role in relationship to Leadership Development and Continuing Professional Development (CPD) was required.

Method

A national Transfusion Practitioner (TP) workshop was held in 2011, which included TP representation from nine out of the ten Regional Transfusion Committees (RTC) in England. Initial discussions explored challenges to TP development and, in particular, the lack of formal qualifications in this specialty. The workshop identified the wealth of knowledge that TPs had accumulated through experiential learning. This included acknowledgement of a shift from a focus on qualifications and accreditation, to business-focussed learning and, the importance of further development of leadership skills, which are critical to the success of this role.

The workshop was aligned with the NHS Leadership Framework (NHSLF) which has since been superseded by a new, similar, Healthcare Leadership Model. The aim was to explore the leadership skills and qualities needed to be an effective TP.

The findings were summarised in a comprehensive document ‘The Transfusion Practitioner Development Framework’ (Figure 1). The document was made freely available to all TP’s, with excellent evaluation.

Figure 1: The Transfusion Practitioner Development Framework.

These leadership skills were identified as being critical for role effectiveness:
- Self-awareness
- Professionalism
- Influencer
- Negotiator
- Motivator
- Coach/mentor
- Visible role model
- Change agent
- Flexible
- Effective communicator
- Empower self/others
- Creative and innovative
- Credibility
- Intuition.

The framework was not intended to be an exhaustive list of development opportunities but, as a starting point to build upon.

The focus was very much ‘on the job’ learning and development, as this is widely recognised as the optimum way of enhancing and improving skills. (Figure 2)

- 70 per cent of learning is experiential, and occurs on the job, as a consequence of doing the work and consciously thinking about what you are doing (and how to do it better).
- 20 per cent of learning is “social learning” – informal coaching, mentoring and learning through the social network of the business.
- 10 per cent of learning is from formal “training”.

Results

Following on from the success of this initial workshop, a number of bespoke leadership development workshops have been requested at a regional level and now each RTC region has held at least one professional development day. Workshops were based on a series of focussed discussions,
exploring the role of TPs as leaders and the skills needed to be more effective on a day-to-day basis. Tools from the NHS Leadership Academy website were used to enable benchmarking and self-assessment on an individual level. The workshops enabled regional TPs to reflect on their role, their effectiveness and the barriers to further role and personal development. They also considered how they could support each other and find support and supervision in their own environment. At the end of the workshop, TPs left with the beginnings of a personal leadership plan.

As a follow up, second workshops were offered in all 10 RTC regions to explore the power and effectiveness of using coaching in everyday conversations using the GROW model (Whitmore 2002). The afternoon of this day focussed on Action Learning Sets (Revens 1982) as a possible solution to networking, problem solving and sharing best practice.

By the close of 2014, approximately 200 TPs will have been involved in at least one, if not both workshops and, written and verbal evaluation have been excellent. Anecdotal feedback suggests some TPs are displaying enhanced leadership skills and using coaching techniques in their conversations. In addition to this, TPs have actively sought out opportunities within their own hospitals, undertaking activities such as work shadowing and stretch projects as well as formulating strategies for change management and heightened self awareness. The workshops are still running with courses booked into 2015.

Comments from Delegates:

“I will be more proactive at my next appraisal, using the framework provided to ask and provide information about my development”.

“The best study day ever! It was re-awakening, revitalising - better than a day in the health spa. It needs to be followed up and kept alive”.

“It reminded me of the skills I have but were not using, as I had got ‘bogged down’ by daily routine”.

“My outlook will be more positive”.

“Plenty of elements of today will impact on my daily routine”.

Future Developments

Formal evaluation of the workshops is to be undertaken within the next 12 months with the focus on how leadership development has changed the TPs and what impact it has had on their roles. It will also explore, what development opportunities they chose to enhance their leadership skills.

Since the launch of these workshops, we have been approached by other interested parties including Transfusion Laboratory Managers (TLM) and we are looking at ways of starting similar work with them.

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References:


NHS Blood and Transplant and The National Blood Transfusion Committee 2010 Survey of Transfusion Practitioners http://jpac.spritecms.co.uk/uk-transfusion-committees/national-blood-transfusion-committee/better-blood-transfusion


Recommended Reading:

1. www.leadershipacademy.nhs.uk
2. www.kingsfund.org.uk/Leadership
3. www.e-lfh.org.uk/LeAD
Inclusivity Marketing Group (IMG): Overseeing a Decade of Improvement in Black, Asian and Minority Ethnic (BAME) Donor Recruitment and Retention

Remit and Context

NHS Blood and Transplant’s (NHSBT) Inclusivity Marketing Group (IMG) was set up in 2003 as a bespoke team, to address the recruitment of Black, Asian and Minority Ethnic (BAME) blood and bone marrow donors. It was tasked with increasing the awareness of donation amongst BAME communities and, increasing the number of donors/donations. The IMG is led by national BAME Marketing Manager Theo Clarke, with representatives from Regional Marketing departments, Communications and Campaigns; Dr Rekha Anand represents the medical function of NHSBT. Together, they create, maintain and expand upon the internal and external relationships, that are crucial to BAME recruitment and retention.

BAME individuals make up 14 per cent of the UK population, an increase of 5 per cent in 10 years; a percentage that continues to rise. Recent estimates state that 20-30 per cent of the population will be BAME by 2050. In the last decade the number of active BAME donors on the donor base has increased more than ten fold but the active donor base (4.5 per cent BAME) still doesn’t adequately represent the population at large.

BAME individuals are the source of many of our rarest types of blood, for example, the Bombay type and blood that is negative for antigens such as In. Black donors mainly have an “Ro” Rhesus (Rh) phenotype and, are more likely to be negative for the Jk, Fy and Fy antigens. For the first time, marketing activity is being planned to specifically address the supply of “Ro” donations – the most common Rh type amongst sickle cell patients in the UK.

Demand for red cells for recipients of “Black African”, “Black Caribbean” and “Black Other” ethnicities outstrips supply with over 17 per cent of frozen donations being provided by 0.57 per cent of all blood donors (NHSBT data, 2010). Donations from black communities are particularly important in the treatment of sickle cell disease and thalassaemia, conditions that are more common in these communities and require regular blood transfusions. Sickle cell patients are best transfused with phenotype-matched blood to prevent the formation of alloantibodies, which make it more difficult to source suitable blood for future transfusions.

Key Achievements

• Community led initiatives, such as the blood donation drives during Muharram with the Islamic Unity Society.

• Organisational collaboration, for example, working with the Sickle Cell Society (Sickle Cell and Thalassaemia Screening Programme) and the African Caribbean Leukaemia Trust. Faith group initiatives with the Seventh Day Adventist Church, Church of Latter Day Saints and the Sant Nirankari Mission.

• International collaboration, for example, involvement in the Missing Minorities Project (MIMI) led by Sanquin Blood Supply; the development of an Action Plan for Minority Recruitment.

Community engagement at a grass roots level is an essential facet of the IMG, raising awareness and myth-busting within the local community, to improve the identification and recruitment of rare blood donors. Its work has facilitated year-on-year increases in the number of BAME blood donors – over the last four years, at a time when the overall donor base is decreasing. Annual Bone Marrow registrations from BAME communities are consistently above population trends, with overall BAME registrants breaking 5 per cent for the first time.

Challenges

The BAME community remains a challenging landscape to operate in. It is more difficult to recruit and retain BAME donors and harder to raise the frequency of donation than it is in Caucasian donors. Many BAME donors regularly return to their countries of origin; thus the rules surrounding travel within our Donor Selection Guidelines, for example, from malarious countries, affect their eligibility to donate once they return to the UK. Forty per cent of the black community does not own a car, which impacts upon their ability to access donation sessions. The perception that religious beliefs affect the ability to donate, poses a significant barrier and has a greater impact than the beliefs themselves. All major faiths support the notion of blood donation - NHSBT has previously held donation sessions in Gurdwaras, Mosques, Mandirs, Synagogues and Churches of many denominations. An ageing population, along with increased demand from emerging treatments and innovations in the treatment of sickle cell disease, add to the challenge.

As the BAME population increases, it is essential for NHSBT to integrate BAME donors into the current donation landscape – moving away from small infrequent sessions towards large scale frequent sessions. By developing and maintaining effective relationships with communities, it is essential that we overcome the barriers and misconceptions about donation, in order to meet the demand for suitably-matched blood and organs.
**The Future**

2015 will see the launch of an ambitious five year BAME strategy. With a focus on improving the frequency and retention of existing BAME donors and increasing recruitment of new BAME donors, the strategy aims to build upon the excellent foundations laid in the last decade. With ongoing support from senior management the IMG will use its wealth of expertise and experience to ensure that, wherever possible, demand from hospitals can be met by providing blood “off the shelf” or by calling in specific donors. NHSBT is working hard to investigate rare blood type requirements and usage on a national scale, to better embed these requirements within our donor engagement strategies. To this end, NHSBT aims to remain at the forefront of BAME recruitment and retention, for years to come.

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**References:**

Action Plan for Minority Recruitment (September 2013).  

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**Words Matter**

“All words have the “taste” of a profession, a genre, a tendency, a party, a particular work, a particular person, a generation, an age group, the day and hour. Each word tastes of the context and contexts in which it has lived its socially charged life; all words and forms are populated by intentions.” M. M. Bakhtin, The Dialogic Imagination, 1981.

I was recently reading a draft paper from an international colleague and every time I reached the words ‘organ harvest’, I found myself recoiling in distaste. I had not always had this aversion to the word ‘harvest’. Six years ago I remember being publicly challenged by my use of the word. That meeting was launching the Organ Donation Taskforce recommendations, to an intensive care community unused to such challenge. The word harvest, I was told, is deeply offensive to donor families. I have since spoken to many donor families and verified that this is indeed the case. Fortunately, it is a word now seldom heard coming from the mouths of health professionals in the UK and, no longer from my own.

You see, words matter. They do as the Russian philosopher Mr M.M. Bakhtin suggests, reveal our intentions. By the very nature of the way we describe organ donation as ‘donation’, it makes it very clear that we consider this a gift-giving activity. One cannot harvest a gift: except perhaps on Christmas morning in my house.

Since our words carry our intentions, choosing which word to use needs careful consideration and it is not always easy to find the appropriate choice. Organ retrieval is the way we describe the theatre process of organ donation within NHSBT publications and also the word we use when speaking to relatives. Less satisfactory is the use of organ procurement, a common term in the USA, which carries commercial connotations. I have heard other suggestions, such as the ‘patient is going to theatre for organ gifting’. This unwieldy use of the word gift suffers another problem; it can lead to the conclusion that our intention is merely cynical self-propaganda. Striking the right balance is something we must continually strive to achieve and, we must be prepared to shift our word choice over time.

I am finding myself describing the surgical removal of organs from deceased patients as organ recovery. This to me captures the nuances of our evolving practices and technologies. In Donation after Circulatory Death, every minute counts as warm ischaemia damages the organs further. The word ‘recovery’ captures the imperative that time is of the essence. As we move toward novel technologies in donation and transplantation, especially ex-situ assessment and treatment of deceased donor organs, recovery likewise reminds us that the dying process, whether that leads to Donation after Circulatory Death or Brain Death, damages the organs and that the organs can benefit from efforts to recover them, even after they have been removed from a deceased donor.

There may be other words in our transplantation nomenclature also in need of recovery. There is nothing marginal about a donor and, I challenge any surgeon I hear using this term. The organs may be marginal but the donor making this gift surely can never be. Extended criteria organs, whilst far from perfect, at least avoids any potential disparagement of the donor and their family.
Brain death or, brainstem death, are other words I believe we should be moving away from. These words are frequently misunderstood by the media (especially when it passes out of mainstream news outlets) and are even misunderstood by the health professionals who should know better. Is it any wonder then that the public is confused? In a 2013 Northern Ireland public attitudes survey, 21 per cent of those surveyed believed one could recover after brain death and 24 per cent didn’t know. I am not the first to suggest abandoning these confusing words. Without fanfare, and thus missed by most, the latest Academy of Medical Royal Colleges Code of Practice (2008) for the Diagnosis and Confirmation of Death removed any mention of the term ‘brainstem death’ or ‘brain death’ and instead refer to the diagnosis and confirmation of death in a patient in coma or after cardiorespiratory arrest. There is according to the Academy only one death but there are differing circumstances, and thus requiring different criteria, when a doctor must make the diagnosis. In my own practice when discussing neurological criteria for death with relatives I avoid any use of brain death or brainstem death. Instead my essential message is that death is suspected to have already occurred and that tests will be carried out to confirm or refute this suspicion.

Consent (authorisation in Scotland), deemed or otherwise, is part of ‘The Taking Organ Transplantation to 2020’ strategy which calls for a revolution in public behaviour. The words we choose to use, as we attempt this revolution, will shape the debate and our actions over the next six years. When we talk about family refusal or overrule of a known wish to donate, we clearly signal a belief that such decisions by families are wrong. Many may agree with us but many will not, especially those resentful of external moralising into an area previously the domain of private or familial choice. This might exacerbate the trend we are already observing, an increase in known wishes not to donate, as expressed by families during approaches for organ donation. The Welsh introduction of deemed consent will mean that the Organ Donor Register (ODR) for the whole of the UK will change, to ensure we maintain just one UK register, not two. Therefore from July 2015 everyone in the UK will have the option to register a wish on the ODR not to donate an organ. We must take extra care with the words we use, lest we counter our intention and promote opting out.

There is one final reason why we in the UK have a double obligation to be mindful of the words we use. As the home of the English language our word choices have international implications.

**References:**

**Next Generation Sequencing – Tissue (HLA) Typing Adult and Cord Blood Stem Cell Donors for Transplantation**

Only thirty percent of patients who need a haematopoietic stem cell transplant (HSCT) have a suitable related matched donor available. Thus, for the majority of patients, a search for an unrelated matched adult or a cord blood donor is necessary by haematopoietic stem cell registries such as the British Bone Marrow Registry (BBMR). Adult donors are currently recruited to the BBMR at blood donor sessions, with typically eight thousand new donors enrolling each year. In addition, over two thousand cord units are registered per annum, collected from consenting mothers by the NHS Cord Blood Bank from six hospitals in the London area.

Selection of a suitable unrelated donor is primarily determined by the degree of Human Leucocyte Antigen (HLA) ‘tissue type’ matching with the recipient. HLA plays a key role in the immune response and compatibility is essential to reduce the risk of post transplant complications, such as graft versus host disease and rejection, and improves overall survival. The HLA genes that are important for matching patients and donors code for more than 11,500 different alleles which makes HLA typing a complex procedure. Several molecular techniques are in use routinely, each providing results at different levels of resolution.

HLA typing of adult and cord blood donors registered with the BBMR is currently performed using sequence specific oligonucleotide probes (SSOP) on a Luminex platform, due to its high throughput capability and
suitability for automation. Luminex SSOP technology relies on specific DNA probes binding to complementary sequences of DNA on the HLA region of the genome and typically produces a low to medium resolution HLA type. However, recent publications have reported significantly better outcomes in patients who have received HSCT from donors HLA matched at higher levels of resolution. Consequently, further extended typing is required before final donor selection, to ensure that those identified as potentially compatible during the search process are matched with the recipient at the allele level. This delays the transplant and incurs significant costs associated with obtaining samples and performing additional testing. Extended typing of multiple donors is usually necessary before the best match is determined, particularly for patients with less common HLA types. The time taken to identify a suitable donor could be significantly reduced if registries performed HLA typing at allele level on all donors at the point of registration, thereby negating the need for future extended typing. However, this level of HLA typing requires the use of sequencing techniques. Whilst conventional Sanger sequencing based typing (SBT) was established over 20 years ago, it is expensive and difficult due to the polymorphic nature of HLA genes. In addition, SBT is not amenable for high throughput, making it unsuitable for registry typing.

Next Generation Sequencing (NGS) is a recent revolution in DNA sequencing technology, with its capacity to produce large amounts of data relatively quickly and cheaply. On single samples, NGS can generate a high proportion of an individual's genetic sequence in one experiment. However, when combined with novel DNA identification or ‘bar-coding’ technology, it can also be used to target a specific region of the genome from many individual samples in one pool. NGS has only recently been explored for HLA typing since the advent of bench top sequencers and improvements to the chemistry. As well as the ability to process high sample numbers, clonal sequencing (the basis of NGS technology) has the added advantage over conventional methods of resolving ambiguities caused by the high degree of HLA polymorphism.

Figure 1: Overview of NGS protocol.

Data analysis
Sequencing on the MiSeq
Pooling of amplicon
Pooling of HLA genes
Amplification of HLA genes
DNA preparation

The H&I R&D and service laboratories at NHSBT Colindale have developed an in-house, semi-automated protocol for sequencing HLA genes on a MiSeq (Illumina®) NGS platform, summarised in Figure 1. Briefly, DNA is extracted into a 96 well microplate and, subsequently purified and adjusted to a standard concentration. The normalised DNA is added to in-house ‘master mixes’ containing key ingredients and subjected to repeated cycles of heating and cooling to make multiple copies, so called ‘amplicons’, of each HLA gene. Following purification, amplicons from each HLA locus are then pooled, fragmented and labelled with a DNA barcode identifier to permit downstream pooling of up to 95 samples into a single tube, known as a ‘library’. The DNA library is subsequently loaded onto the MiSeq on which the clonal amplification and sequencing reactions occur (Figure 2).

Figure 2: The MiSeq (Illumina®).

Due to the complexity of the NGS protocol, it has been necessary to design and write programs for liquid-handling robots, to minimise hands on time and reduce the risk of sample transfer error. In addition, we have commissioned bespoke software to track each sample through the process. Raw data files generated by the MiSeq are analysed using commercial software which employs complex algorithms to assemble and align sequences, generated for each fragment. The resulting consensus sequence is then compared to a database of known HLA sequences in order to assign the HLA type.

This high throughput, cost-effective method, is currently undergoing formal validation at the H&I laboratory in Colindale, with the aim of typing all adult donors by NGS from December 2014. This will ensure that, in future, all donors recruited to the BBMR will be unambiguously HLA typed at the allele level and, in this way, contribute to the faster identification of the most compatible donor and, to an improved outcome of the procedure in patients transplanted with matched unrelated donors.

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Lean Working Within NHSBT

NHS Blood and Transplant has an ambition to be the best organisation of its type in the world. We want to be the supplier of choice to our customers, respected globally for our expertise and recognised by staff as a great place to work. Some key factors in helping achieve this, are ensuring that we are as efficient an organisation as we can be, delivering value to our customers and engaging and developing our staff.

We recognise that our customers, as well as us, face financial pressures as the NHS has to make spending cuts, hence we work on the principle that every £1 saved on the price of our products and services is £1 available to treat patients.

Approximately five years ago, a strategic review of NHSBT blood supply chain identified potential for improving productivity, which could release savings to the NHS. As an organisation, we benchmark against other ‘not for profit’ Blood Establishments who form the ‘European Blood Alliance’, and could see that we were behind some of our counterparts in terms of productivity. At that time, the price of red cells had also steadily increased year on year, to a high of approximately £140 per unit. NHSBT embarked on a programme of improvement to make efficiency savings, and improve productivity.

Our improvement programme utilised lean - a philosophy which focuses on the continuous elimination of ‘waste’, creating ‘value’ for the end customer and the involvement and empowerment of staff to make change. Lean considers that ‘value’ is any process that a customer would be willing to pay for; any other parts of the process are wasteful and should be reduced/eliminated.

Waste is categorised into eight types:

- Transportation (unnecessary transfer of work in progress).
- Inventory (work or information waiting for action).
- Motion (people or equipment moving more than required).
- People’s Potential (not using staff skills or experience at the right level).
- Waiting (time spent waiting for the next step in the process).
- Over Production (producing too many items ahead of demand).
- Over Processing (performing unnecessary processing steps).
- Defects (time and effort involved in checking or correcting defects or errors).

The programme started with a series of events looking at the current state of our processes, and then developed our ‘future state’, based on the blood supply chain strategy. A series of events were then held in order to identify improvements in each part of our process, implementing lean ‘cells’ which worked towards achieving our future state targets. The introduction of lean into the blood supply chain achieved significant improvements by streamlining the way we collect, process, test and issue of our products. Over the past five years, some benefits have been:

- A reduction in the red cell price from £140 to £123.
- An increase in productivity in component manufacture and testing which now places us in the upper quartile of blood services in Europe.
- The release of over £10m per year back to NHS front line patient care.

Following the successful implementation of lean to the blood supply chain, lean principles have been adopted right across the organisation. In April 2013, Histocompatibility and Immunogenetics (H&I), Red Cell Immunohaematology (RCI), British Bone Marrow Registry (BBMR), Cord Blood Bank (CBB) and Cellular and Molecular Therapies (CMT) embarked on a journey to utilise lean. The drive for our Specialist Services (SpS) functions was to remove waste in order to create capacity for growth of our services, improve quality and make non-pay savings where possible. In the 18 months since starting, these functions have trained 76 per cent of staff to understand basic lean principles, to recognise waste and be able to support improvement events, and have run over 100 events to identify and implement improvements. To date, over 28,000 hours capacity has been released within SpS which has enabled the functions to manage growth of the business within their original establishment of staff. In May 2014, our Stem Cell laboratories reduced the time taken from end of collection of hematopoietic progenitor cells for autologous transplants to reporting. This enabled them to improve their performance against the Service Level Agreement (SLA) with transplant centres.

NHSBT continues to work hard to embed lean and a culture of continuous improvement right across the organisation, in order to provide the best possible service to our users. Staff training has been essential to achieving our goals, and we are now in a position where we have the capability to deliver training and run improvement events without support from external lean experts. Our comprehensive training programme supported by ‘in house’ staff with specialist lean knowledge and experience, ranges from basic level awareness training via our on line
training portal, right up to training highly skilled lean experts. It is our goal to have 100 per cent of NHSBT staff aware of lean principles with the ability to recognise waste in any of the processes they undertake.

As we strive to continually improve and share learning, we have been working in partnership with many other public sector organisations such as RNLI, (Royal National Lifeboat Institution), CQC (Care Quality Commission) and West Yorkshire Police, in order to share best practice ideas to assist our development.

Where lean started out primarily as a set of principles that were applied to manufacturing industries such as car manufacturers, evidence of improvement within NHSBT and across other healthcare organisations has shown us that there is definitely a place for lean in healthcare.

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Blood Donation’s Leadership Induction Pathway – Investing in our Leaders of the Future

In July 2013, NHSBT’s Blood Donation directorate underwent a significant organisational redesign. The proposals outlined in the Blood Donation Organisational Design (BDOD) mark one of the most significant changes to the organisation, structure, span of control, reporting lines and accountabilities that NHSBT had implemented, in many years. The primary objective was to ensure that Blood Donation has an effective organisation structure in place, to ensure delivery of the Blood Supply Strategy over the coming years.

A big part of those changes was the implementation and development of a new leadership team, who would lead the blood donation teams forward through a transformational agenda, which would meet our hospitals and donors needs. Each Blood Donation Team was assigned a new nursing leader, who would take up the role of a Senior Sister/Charge Nurse. Supporting them is the creation of Area Manager/Matrons who work across 17 areas.

Many existing Area Lead Nurses and session nurses along with nurses attracted from across the wider NHS, were recruited into 67 positions across the mobile collection teams. A further 17 senior nurses and operational managers were recruited into the Area Manager/Matron posts.

NHSBT depends on having the right leaders in the right place, to drive transformational change, deliver continuous performance improvement and maximise the contributions of teams to deliver excellent donor experience. In order to prepare them to take up their role with confidence, a Leadership Induction Pathway (LIP) was designed, led by Organisational Workforce Development in collaboration with Blood Donation. The investment given to our new leaders was seen as an essential component of BDOD to ensure that the next generation of leaders is ready for the complex, challenging and exciting demands of running our organisation. The pathway involved an initial 12 week induction programme designed to prepare them to take up their role, followed by ongoing support whilst in the role, to ensure they have the skills, knowledge and behaviours required to lead our teams. The pathway is to be viewed as a 9-12 month journey, to nurture new leaders so they feel confident and competent in their roles.

The aim of the programme was to achieve the following three strategic objectives:

1. People will be customer-focused, providing the highest level of service to donors.
2. Leaders will work with their teams to deliver the highest standards of performance.
3. People will be empowered to deliver great leadership which engages and motivates their teams.

The pathway involves a combination of off-the-job learning in three leadership residential modules, peer mentoring, line manager support, master classes, coaching and on-the-job self-directed learning, culminating in a written assignment which can be submitted to gain masters level accreditation towards a Dynamics of Leadership module with Manchester Metropolitan University. The underpinning themes of the whole of the pathway, are explored within two themes: Leading Self and Leading Teams and has been designed to incorporate various messages as ‘golden threads’ through all sessions:

- Customer Service.
- Performance Management.
- Leadership.

The first of six cohorts of managers, embarked on their leadership pathway in October 2013. The final cohort has just completed their Induction in October 2014, all of which are now in position and many already seeing changes within their own teams.
Whilst we have yet to formally evaluate the programme, in terms of how well it prepared them and whether we have seen the effect of building strong leaders on sessions, one of its greatest successes has been the strength in the network of peer support. Each individual has built a network of colleagues, peers and friends who will provide support to them as individuals but, also, in challenging progress; providing a motivated and committed leadership team.

The successes so far have been:

- Fully-operational leadership team, in place having recruited significant leadership potential internally and externally. This has brought challenges of supporting mixed experience and confidence.
- Clear expectations of role and, subsequently driven and committed to a long awaited vision.
- Engaged and empowered management/leadership team working to a shared vision.
- Beginning to address the challenges of team morale, sickness and individual performance.

Some of the comments from those undertaking this programme have been:

“Excellent preparation for Senior Sister/Charge Nurses into their roles – really helped engage and motivate them for role particularly new and promoted people.”

“The confidence of knowing the values and direction of the organisation align with mine. Empowerment to make those things happen and take actions to improve performance and challenge individuals. Customer/donor focus on everything we do; this is a change.”

“Feeling of value, being given protected time out of business as usual reinforces the organisation is committed to helping us succeed.”

This Leadership programme has been seen by many across the organisation as a unique investment. Jane Pearson, Assistant Director and Chief Nurse of Blood Donation has said, “LIP has been the most important action we took as part of our overall change programme, it has both inspired and educated a new frontline leadership cadre to lead our staff to deliver balanced performance aligned to our aspirations for culture change and putting the donor at the heart of everything we do.”

Chris Elding
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Estimated Risk of Cancer Transmission from Organ Donor to Graft Recipient in a National Transplantation Registry

One of the risks of transplantation is transmission of cancer from the donor organ. This risk has been reported to be small (0.01–0.05 per cent) and must be balanced against the risks to the individual of not receiving a donor organ and remaining on the waiting list. Indeed, up to 20 per cent of those on the UK National Transplant List for heart, lung or liver transplants and 6 per cent awaiting kidney transplants, die or are withdrawn before a graft becomes available.

Between 2001 and 2010 in the UK, 15 (0.05 per cent) of 30765 transplant recipients developed donor-transmitted cancers, of whom three died as a consequence. During the same period, 4093 patients died while awaiting transplantation. Although a rare occurrence, donor-transmitted cancers are often reported in the media, whereas deaths among patients awaiting a transplant receive little or no publicity.

Guidelines for the use of organs from donors with a history of cancer have been developed by the Council of Europe (CoE) and the Organ Procurement and Transplantation Network/United Network for Organ Sharing (OPTN/UNOS) in North America. The guidelines focus primarily on reduction of cancer transmission risk. An inevitable consequence of reducing this risk by excluding some donors is further exacerbation of the donor shortage and, an increase in transplant waiting-list mortality.

The aim of our study was to explore the English experience of transplanting organs from donors with a history of cancer, to assess the risk of cancer transmission and the potential for safe expansion of the donor pool. The study was a statistical analysis of actual donors from 1 January 1990 to 31 December 2008 and resident in England and potential/possible donors (defined below) in the UK from 1 October 2009 to 30 September 2012 (data from 1990 to 2008 was not available).

The following definitions were used. Possible donation after brain death (DBD) was from an individual whose suspected neurological death met the criteria of apnoea, coma of known aetiology, need for ventilation and fixed pupils. A possible donation after circulatory death (DCD) was from a person receiving ventilatory support whose imminent death was anticipated and for whom a clinical decision was made to withdraw treatment. A potential DBD/DCD donor was defined as a possible DBD/DCD donor with no absolute-relative contraindication to donation.

The cancer transmission risk of actual and potential/possible donors was classified according to the CoE and OPTN/UNOS guidelines into standard/non-standard or unacceptable/high. Donors with a non-standard risk were those with a history of cancer (except unacceptable/high-risk tumours) with a cancer-free interval of less than 10 years.

Results

Actual Donors with Unacceptable/High Risk of Cancer Transmission and their Recipients

Of the 202 donors with cancer, 61 had cancers classed as having an unacceptable/high risk of transmission according to the CoE and OPTN/UNOS guidelines. These 61 donors donated 140 organs to 133 recipients, comprising a total of 86 kidneys, 22 livers, 10 hearts, 8 lungs and 7 multiple organs (4 kidney–pancreas, 2 heart–lung and 1 kidney–heart).

Comparison of the survival of recipients of single organs from donors with an unacceptable/high risk and standard/non-standard risk of cancer transmission revealed no significant difference in unadjusted survival or risk-adjusted hazard of death (Table 1).

At 10 years after transplantation, the additional survival benefit of transplanting the organs from donors with an unacceptable/high risk of cancer transmission was 944 (95 per cent confidence interval (C.I) 851 to 1037) life-years, with a mean survival of 7.1 (95 per cent c.i. 6.4 to 7.8) years per recipient. Eight of these recipients developed post-transplant cancers, but none had the same cancer type as their donor, indicating these were likely to be de novo cancers (Table 2).

Potential Donors Excluded Based on a Medical History of Cancer

Data from 23376 possible donors were examined (3996 DBD, 19380 DCD). Six people were identified with a history of cancer classed as unacceptable/high risk and no other contraindication to donation. Among these were three patients with treated breast cancer without recurrence at five, ten and 15 years, two with treated colorectal cancer without recurrence for 12 and 18 years, and one patient with melanoma treated 15 years previously without evidence of recurrence.

At present in the UK, the mean number of organs retrieved is 2.6 per DCD donor and 4.0 per DBD donor. Thus, these six donors (all possible DCD) would be anticipated to have donated 15 additional organs for transplantation (five additional organs per year).

<table>
<thead>
<tr>
<th>Recipient group</th>
<th>Transplants from donors with an unacceptable/high risk of cancer transmission</th>
<th>Transplants from donors with a standard/non-standard risk of cancer transmission</th>
<th>Risk-Adjusted hazard of death for recipients from donors with unacceptable/high risk***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidney</td>
<td>Mean age (years)</td>
<td>Recipient survival (years)</td>
<td>Mean age (years)</td>
</tr>
<tr>
<td>86</td>
<td>47.4 (43.7, 51.0)</td>
<td>8-79 (3.80, -)*</td>
<td>23,994</td>
</tr>
<tr>
<td>Liver</td>
<td>22</td>
<td>41.2 (32.6, 49.9)</td>
<td>5.37 (0.11, -)*</td>
</tr>
<tr>
<td>Heart</td>
<td>10</td>
<td>34.3 (22.8, 45.8)</td>
<td>3.75 (0.01, -)*</td>
</tr>
<tr>
<td>Lung</td>
<td>8</td>
<td>39.0 (28.1, 49.9)</td>
<td>0.43 (0.04, 5.94)</td>
</tr>
<tr>
<td>Pancreas</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Values in parentheses are 95 per cent confidence intervals. *Upper confidence limit for survival of recipients was not under 75 per cent, and therefore not estimable. **Comparison of recipient survival (log rank test). ***Cox regression modelling.

Table 2: Post-Transplant Cancers in Recipients of Organs from Donors with Unacceptable/high-risk Cancers.

<table>
<thead>
<tr>
<th>Donor cancer</th>
<th>Interval between donor cancer diagnosis and donation (days)</th>
<th>Organ transplanted</th>
<th>Recipient cancer</th>
<th>Interval from transplant to diagnosis of recipient cancer (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemangiosarcoma</td>
<td>3</td>
<td>Kidney</td>
<td>Glioma</td>
<td>307</td>
</tr>
<tr>
<td>Medulloblastoma</td>
<td>0</td>
<td>Kidney</td>
<td>Small cell cancer liver secondaries</td>
<td>339</td>
</tr>
<tr>
<td>Hodgkin’s lymphoma</td>
<td>4,715</td>
<td>Kidney</td>
<td>Colonic adenocarcinoma</td>
<td>828</td>
</tr>
<tr>
<td>Glioblastoma</td>
<td>2</td>
<td>Kidney</td>
<td>Thyroid adenocarcinoma</td>
<td>933</td>
</tr>
<tr>
<td>Medulloblastoma</td>
<td>0</td>
<td>Heart</td>
<td>Acute myeloid leukaemia</td>
<td>1,371</td>
</tr>
<tr>
<td>Glioblastoma</td>
<td>2</td>
<td>Kidney</td>
<td>Melanoma</td>
<td>3,751</td>
</tr>
<tr>
<td>Neuroectodermal tumour</td>
<td>2</td>
<td>Heart</td>
<td>Prostate adenocarcinoma</td>
<td>3,930</td>
</tr>
<tr>
<td>Glioblastoma</td>
<td>1</td>
<td>Liver</td>
<td>Non-Hodgkin’s lymphoma</td>
<td>3,994</td>
</tr>
</tbody>
</table>

Primary liver tumors found in the explant, non-melanoma skin cancers and in situ carcinomas are excluded.

Discussion

The present study, points to a potential overall benefit in survival, if organs from selected donors with a history of cancer are used for transplantation. A small, yet real, risk of cancer transmission is present, of which the recipient should be advised. Notably, although the risk can be reduced by careful assessment, it cannot be abolished.

In the UK, the waiting-list mortality rate for patients in the first year of being listed for transplantation ranges from 2 per cent for kidney to 17 per cent for lung candidates. When organs from a donor who has had cancer are offered for transplantation, the risk of cancer transmission has to be balanced against the consequence of declining such organs. The present study found that recipients of organs from selected donors with an unacceptable/high risk of cancer transmission had the same survival and risk of death as recipients of organs from donors with a standard/nonstandard risk. In addition, there was no cancer transmission from 61 donors with unacceptable/high-risk cancers, although the cohort of such donors was small and these organs were transplanted after careful risk assessment.
Nonetheless, this evidence indicates that there is a proportion of donors with a history of cancer currently classified as unacceptable/high risk, whose organs can be transplanted without compromising recipient survival and, with very low rates of cancer transmission. Therefore, it is likely that strict adherence to the present guidelines has resulted in inappropriate exclusion of some donors, whose organs could have been transplanted, with very low risk of cancer transmission.

In addition to highlighting the non-transmission of cancer from actual donors, the present data on potential/possible donors suggest that an increase in the number of donor organs could be achieved by including selected donors with a history of cancer. Although the projected number of additional organs is small (about five per year), these would make a real difference to outcomes, especially when an urgent life-saving transplantation is needed.

References:


CPD Questions

Using Blood and Blood Components from the post 1996 Birth Cohort as a variant Creutzfeldt – Jakob disease (vCJD) risk reduction measure

1. Club ‘96:
   a) NHSBT sponsored Holiday Club.
   b) Are people who have had an appendectomy and born on or after January 1996.
   c) Are people who have never eaten meat.
   d) Are blood donors born on or after January 1996.

2. Studies have shown for previously CMV, EBV and B19 sero-negative donors from a 17 year old donor cohort:
   a) No detectable CMV, EBV and B19 viraemia.
   b) A low seroconversion rate.
   c) A high seroconversion rate.
   d) Pose no risk to potential recipients.

3. Club ‘96 Blood Donors:
   a) Could meet all demand for blood products very soon.
   b) Could meet neonatal and intra-uterine demand for blood products within months.
   c) Have been shown to have no prion accumulation.
   d) In the 17-20 year olds group carry a low risk of CMV transmission.

Audit of the Use of Fresh Frozen Plasma (FFP) in the East Midlands Region

4. Background:
   a) The use of FFP has significant evidence to support benefit in all clinical areas.
   b) Is indicated as first live treatment in the reversal of warfarin.
   c) Intensive educational measures can improve appropriate use of FFP.
   d) Is only used with abnormal pre-transfusion coagulation.

5. Principal Findings:
   a) All had policy documents in relation to FFP transfusion.
   b) Thromboelastography was often used to guide therapy.
   c) Actual volumes of FFP transfused are always known.
   d) Benefits of FFP transfusion were always documented.

6. Recommendations:
   a) Local guidelines should define appropriate dose (number of units) of FFP.
   b) Local guidelines on the reversal of anticoagulation with warfarin should emphasis sole use of FFP.
   c) Regular audits of compliance with local guidelines are not required.
   d) Use of FFP for the treatment of bleeding should be guided by appropriate tests of coagulation before and after transfusing FFP.

The Changing Face of Pathology Services and How this is Impacting on Blood Management

7. The Carter Report:
   a) Details the success of the 39th American President.
   b) Made recommendations for the transformation of Pathology Services.
   c) Was quickly adopted and implemented.
   d) Did not affect Blood Transfusion.

8. Learning Points:
   a) Staff skill mix is not a major consideration.
   b) Use of Key Performance Indicators is not useful.
   c) Common procedures and equipment is helpful.
   d) No requirement to monitor effect of transformation process.

9. Modernising Scientific Careers:
   a) Will remove the need for university education.
   b) Will remove the need for work-placed learning.
   c) Only affects Medical Physicists.
   d) Will create a more responsive work force.
10. Modernising Scientific Careers:
   a) Affects all the scientific work force from Agenda for Change Band 2 up to Band 9.
   b) All will be required to obtain a Doctorate.
   c) All parts of the curriculum must be delivered in-house only.
   d) Individual trusts will fund the necessary training from existing sources.

Leadership Development for Transfusion Practitioners in England

11. Learning is:
   a) 5 per cent from formal training.
   b) 10 per cent from formal training.
   c) 20 per cent from formal training.
   d) 70 per cent from formal training.

12. Experimental Learning is:
   a) Learning from experiment.
   b) Learning exponentially from mistakes.
   c) Learning from others.
   d) Learning from experience.

Overseeing a Decade of Improvement in BAME Donor Recruitment and Retention

13. Currently BAME individuals make up:
   a) 5 per cent.
   b) 14 per cent.
   c) 20 per cent.
   d) 30 per cent
   Of the UK Population

14. Commonest RH type amongst Sickle Cell Patients in the UK is:
   a) r.
   b) R_r.
   c) R_s.
   d) R_o.

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.
Clinical Case Studies

Scenario Part 1

A young man was transferred from an overseas military medical unit. He had suffered with severe polytrauma and had received damage control resuscitation including transfusion. He was transferred to the UK for further surgery and intensive care. On admission to Intensive Therapy Unit, he was re-assessed prior to urgent surgery. The baseline haematology results are shown below:

- Hb 8.2g/dL
- WBC 3.3 x 10⁹/L
- Platelets 45 x 10⁹/L
- INR 1.5
- APTT 1.5

Transfusion support was requested. The blood group and antibody screen was performed using a semi-automated DiaMed method. A tile group was also performed. The card is shown below:

The results were recorded in the laboratory information system as follows:

<table>
<thead>
<tr>
<th>S</th>
<th>S</th>
<th>S</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>MF</td>
<td>MF</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Question 1

Describe and interpret the findings.

Question 2

What are the possible explanations and what is the most likely?

Question 3

What advice would you give concerning the selection of blood components?

Scenario Part 2

During the next five days he received 50 units of red cells, four units of Fresh Frozen Plasma and five units of platelets. He became increasingly unwell and required urgent surgery with further transfusion and renal support. You are contacted by your Blood Bank Manager to be informed that clinical staff have taken eight units of Group O Fresh Frozen Plasma together with the Group O red cell units.

Question 4

What risk does this present and what advice would you give concerning the investigations, monitoring and care of the patient?

Question 5

What advice would you give concerning the further transfusion support for this patient?

Question 6

What other techniques could you use to determine the blood group of this patient and what are the limitations?
A1 Answers

a) The card shows anomalous ABO results in a DiaMed card.

b) The forward group is indeterminate as the anti-A and anti-D show mixed field results with predominantly group A cells and RhD positive cells. The reverse group shows only anti-B. The DiaMed card suggests that there are dual populations in both the anti-A and anti-RhD columns. The antibody screen is negative and the negative control excludes the presence of cold antibodies in the patient sample.

c) Anomalous results should be resolved initially by repeat grouping and if necessary by the testing of a further blood sample. The cell group should not be taken on its own to represent the group of the patient if the serum group obtained differs from the expected.

A2 Answers

The most logical explanation is that he is a group A RhD positive patient who has received emergency group O RhD negative blood in a field hospital.

The following causes may be considered in the event of mixed fields:

a) Transfusion of O into A.

b) A3 subgroup.

c) Post BMT.

d) Chimerism. Chimerism has been shown in military patients several years after transfusion with non-leucodepleted blood.

e) Polyaagglutination.

f) Anti Lu<sup>a</sup> and Sd<sup>a</sup> (if using tube method with microscopic reading).

g) Massive fetomaternal haemorrhage.

A3 Answers

a) Request transfusion history. In other words, what is his recorded blood group, if known, and has he received group O negative blood.

b) If he is a British soldier, check historical blood group on NHSBT Hematos system.

c) Perform a direct antiglobulin test and test for evidence of haemolysis. If the direct antiglobulin test is negative and there is a historical group, treat as group A positive.

d) If there is no historical blood group, and the direct antiglobulin test is positive, use compatible donor blood components; O negative is the universal group but, if he is likely to need a massive transfusion, consider O positive red cells; AB or A fresh frozen plasma; and A or B platelets.

e) Once the group is confirmed, he should then be treated with group-specific or group-compatible components.

A4 Answers

a) Eight units of group O fresh frozen plasma may present a risk of haemolysis due to anti-A and anti-B. The severity will depend on a variety of factors, such as the haemolysin level of the fresh frozen plasma, the plasma volume and the amount of circulating group O red cells.

b) The patient should be monitored and managed for haemolysis due to ABO and disseminated intravascular coagulation. The disseminated intravascular coagulation may be associated with the ABO incompatibility or may be due to the underlying condition.

c) Repeat the antiglobulin test. If this becomes positive, elution studies can be performed, to confirm whether this is due to anti A or an alloantibody.

d) Additional activity should include Blood Bank security and education of clinical staff. It is a common misconception, that the use of group O red cells as universal blood, should be accompanied by group O fresh frozen plasma.

A5 Answers

a) If the direct antiglobulin test is positive, the patient should continue to be supported using universal components, in other words, Group O red cells, Group A platelets and Group A or AB fresh frozen plasma, until the direct antiglobulin test becomes negative.

b) In this patient the direct antiglobulin test continued to be positive three weeks later. The Haemoglobin fell slightly following surgery, however, the serum bilirubin did not rise. There was no associated disseminated intravascular coagulation. The full blood count and clotting corrected with general supportive measures.

A6 Answers

a) Continue with universal components until the direct antiglobulin test is negative. Group O positive blood should be used for males requiring large transfusion. However, as this patient has been repeatedly transfused, confirm that there are no allo-antibodies. See recently updated National Blood Transfusion Committee guidelines, for the Appropriate Use of group O negative blood.

b) Consider genotyping using a PCR-based assay on peripheral blood or a buccal smear. In most of these UK cases, all the blood used is leucodepleted. All whole blood counts in a peripheral blood sample should be derived from the patient and, not from the blood. However, if fresh whole blood has been used, in some cases leucocyte depletion cannot be assumed.

It should be noted that in some individuals the genotype does not reflect phenotype. In addition, PCR for ABO is subject to an error-rate and clinical decisions should interpret the results within the clinical context and the serological results.
2015

18-23 January
Genomics and Clinical Microbiology
Location: Wellcome Trust Genome Campus, Hinxton, Cambridge
For more information contact: www.b-s-h.org.uk

23-24 January
ESH-ENERCA Training Course on Haemoglobin Disorders and Laboratory Diagnosis and Clinical Management
Location: Barcelona, Spain
For more information contact: www.esh.org/conferences

29 January
Association of Clinical Pathologists Laboratory Haematology Preparing for the FRCPath
Location: Hallam Conference Centre, 44 Hallam Street, London
www.b-s-h.org.uk

31 January – 2 February
International Conference – the Management of Haematological Malignancies
Location: Marrakech, Morocco
For more information contact: www.esh.org/conferences

13-15 February
35th EHA-ESH Hematology Tutorial Hematological Malignancies and Sickle Cell Disease
Location: Dublin, Ireland
For more information contact: www.esh.org/conferences

5-8 March
World Cord Blood Congress V and Innovative Cell Therapies for Non-Malignant Disease
Location: Monaco, Principauté de Monaco
For more information contact: www.esh.org/conferences

6-8 March
EHA-SWG Scientific Meeting: Red Cell and Iron Disorders, and Myelodysplastic Syndrome (MDS)
Location: Lisbon
For more information contact: www.esh.org/conferences

7-8 March
Revision Course-FRCPath 1
Location: Education Centre, Kingston Hospital, London
For more information: www.b-s-h.org.uk

27-29 March
26th EHGA Hematology Tutorial Stem Cell Transplantation
Location: Yerevan, Armenia
For more information contact: www.esh.org/conferences

25-26 April
EHA-ESH Hematology Tutorial Bone Marrow Failure (Congenital and Acquired Aplastic Anemia)
Location: Erzurum, Turkey
For more information contact: www.esh.org/conferences

27 April – 1 May
Manchester Blood Coagulation Course
Location: Chancellors Conference Centre Manchester University Hospital South of Manchester
For More information contact: www.b-s-h.org.uk

7-9 May
International Conference on The Tumour Microenvironment in the Haematological Malignancies and its Therapeutic Targeting
Location: Lisbon, Portugal
For more information contact: www.esh.org/conferences
21-23 May
19th Training Course on Haemopoietic Stem Cell Transplantation
Location: Malaga, Spain
www.esh.org/conferences

3 June
UK NEQAS for Blood Coagulation Annual Scientific & Participants’ Meeting
Location: Atrium Conference Centre, Sheffield Hallam University, Sheffield
For More information contact:
www.ukneqas.org.uk

9-11 June
Stem Cells: From Basic Research to Bioprocessing
Location: Cineworld: The 02, Peninsula Square, London
For more information contact:
www.b-s-h.org.uk

27 June – 1 July
25th Regional Congress of the ISBT in conjunction with the 33rd Annual Conference of the British Blood Transfusion Society
Location: London
For more information contact:
www.isbtweb.org/events-congresses

29 June
UK NEQAS for Leucocyte Immunophenotyping Scientific Meeting
Location: Sheffield Hallam University, Sheffield
For More Information:
www.ukneqas.org.uk

8-10 September
The 2015 Tissue Engineering Congress
Location: Cineworld: The 02, Peninsula Square, London
For more information contact:
www.b-s-h.org.uk
Notes

CPD Blood and Transplant Matters

Answers Issue 43
