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Blood and Transplant Matters

Information for hospitals served by NHS Blood and Transplant

Inside

Editorial Board:

Rob Webster
Consultant Haematologist, (Editor)
NHSBT, Sheffield
Email: robert.webster@nhsbt.nhs.uk

Lynne Hodkin
Senior PA, (Editorial Assistant)
NHSBT, Sheffield
Email: blood&transplant@nhsbt.nhs.uk

Brian Hockley
Data Analysis and Audit Manager
NHSBT, Sheffield
Email: brian.hockley@nhsbt.nhs.uk

Dale Gardiner
Deputy National Clinical Lead in Organ donation
Email: dale.gardiner@nhsbt.nhs.uk

Penny Richardson
Media and PR Manager
NHSBT, Liverpool
Email: penny.richardson@nhsbt.nhs.uk

John Girdlestone
Head of Laboratory
Stem Cells and Immunotherapies
NHSBT, Oxford
Email: john.girdlestone@nhsbt.nhs.uk

Paul Rooney
R&D Manager, NHSBT Tissue Services
NHSBT, Liverpool
Email: paul.rooney@nhsbt.nhs.uk

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

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

EDITORIAL

Welcome to Edition 54 of Blood and Transplant Matters. I hope you enjoyed the last edition and found areas of interest and use. After a review of funding and reader numbers, it has been decided to stop publication of Blood and Transplant Matters. So this will be the last edition.

Firstly, a big thank you to Penny Richardson, for her great contribution over many years, to the Editorial Board of Blood and Transplant Matters.

This edition starts with a re-visit to Harvey's Gang, this time why and how Harvey's Gang was started at Birmingham Women's and Children's Hospital. Michelle Wakelin describes how she started a local Harvey's Gang for the benefit of their young patients. I wonder who has the most fun – staff or patients! If you think your laboratory would benefit from a Harvey's Gang then visit: www.harveysgang.blogspot.com for more information and details.

Next Emily Rich from Kettering General Hospital provided a Transfusion Spot Check Audit complete with method and results. This is in a real time audit that is easy and quick to perform. Providing useful information identifying areas that require improvement. If this tool were adopted across different hospitals, the comparison of results could be both interesting and useful.

Su Brailsford outlines methods that the UK Blood Services use in order to ensure a safe supply of blood and components. This involves not only testing, but collecting transfusion transmitted infections with subsequent investigations. This is also extended across tissue, organs, and cord blood donors, with a continuing eye on emerging infection that might pose a risk.

Susan Brunskill provides a pathway outlining the way the top ten research questions in Transfusion Medicine may be further investigated and hopefully, answered.

Catherine Kimber and Susan Brunskill outline how the Systematic Review Initiative moved from physical filing cabinets and manual searching to a searchable electronic Transfusion Evidence Library and extension to Stem Cell Evidence and a monthly alerting Service. Both have their own URL Transfusion Evidence Library www.transfusionevidencelibrary.com Stem Cell Evidence www.stemcellevidence.com please use.

Next Dale Gardiner looks at how the Organ Donation Committees are being made more effective after a Rapid Improvement Event. The NHSBT and UK as a whole have a tremendous debt of gratitude to those who have served on local Organ Donation Committees, after the recommendations have been fully adopted, these committees should be even more effective.

Finally, but certainly not last, we have two patient's stories. This time describing the huge benefits that a corneal transplant can give to patient of all ages.

As usual there are some CPD questions (and answers) based upon the articles and a case study, which we hope you find interesting and potentially useful.

As this is the last edition of Blood and Transplant Matters, any potential future blood/component related articles could be submitted to Transfusion Medicine: http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-3148. Or to Bloodlines https://www.bbts.org.uk/whatwedo/bloodlines/submit/ if a member of BBTS.

I thank all that have contributed over the 15 plus years, which we have been publishing Blood Matters and the Blood and Transplant Matters.

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

Rob Webster
Consultant Haematologist, (Editor)
NHSBT, Sheffield
Email: robert.webster@nhsbt.nhs.uk

Birmingham Women's and Children's Hospital Laboratory open their Doors to Harvey's Gang

Introduction

Harvey's Gang invites ill youngsters to become trainee biomedical scientists for the day and to tour pathology laboratories with their families. The tours are specifically tailored to the individual children's interests and needs, to lessen their fears, to answer any questions they may have and to help gain an understanding of their healthcare giving them insight to what we do and why.

Background

The amazing initiative was founded by Malcolm Robinson (chief Biomedical Scientist) at Worthing Hospital, Sussex in 2014 in memory of Harvey Baldwin – an 8-year-old that underwent treatment for leukaemia. Malcolm arranged for Harvey to have a pathology tour after his curiosity as to where his blood went during his treatment. This had such a huge impact on Harvey and his family that they decided to allow other children to have the same experiences.

How did we set Harvey's Gang Up?

Harvey's gang tours are in many hospital trusts and spreading across the UK and well underway at The Birmingham Women's and Children's Hospital. Having read about this fantastic charity, as a blood transfusion practitioner I was thrilled to be involved in and work on to make an improvement in the pathology department and develop the individual patient experience. Having signed up we then received the package required to get started, this consisted of Harvey's Gang Goody bags full of presents such as; a Harvey's Gang pad and pen from Ortho-Clinical Diagnostics, a squishy penguin and pen from LabCold, a fabulous Harvey's Gang laboratory coat from Handelsbanken, pens from the SHOT office plus a Certificate of Attendance.

From here we had to get the message out and raise awareness starting with the haematologist consultants, as the highest users of blood products. For me, I was referred a patient and then took it upon myself to contact the family and discuss suitable times and dates. With this in mind, I liaised with the laboratory staff to finalise dates and assign a scientist to undertake the tour. This was my challenge! There was a reluctance to volunteer but after discussing this fantastic opportunity and highlighting the benefits I had a willing volunteer. From here staff could see the benefit that the tours had on the patients and their families and the fun that it involved and are now willing to take part even volunteering. To overcome the challenge of advertising to staff and letting the trust know about this amazing experience for children I contacted the trust communications team and wrote a blog for the daily voice. I have also spoken to staff members in departments to inform them about Harvey's Gang and how to make referrals. Finally, I was in contact with the patient experience team and invited them along to observe one of the tours.

What have we done so far: The Tours:

Young Cancer Patient, Laraib throws disease under the microscope:

Young Laraib, was my first patient to take a tour of pathology and meet with biomedical scientists who take part in her treatment plan, July 2018.

Laraib, aged 11, was diagnosed with ALL ABL2 Leukaemia in February 2017. She has been in and out of hospital ever since. Laraib undergoes regular blood tests and receives many blood transfusions.

After being presented with her own laboratory coat and scientist badge, she became a 'trainee scientist' for the afternoon, accompanied by her mum and cousin. She said she wanted to know the science to understand more of the tour. So Laraib's wish was Satnam's (Biomedical Scientist) command and he successfully made it as simple as possible without being too basic. During her visit, scientists explained to Laraib how her blood samples are tested and watching her own sample being processed as well as looking at all the various machines used in the laboratories. She also looked at her blood cells through a microscope. Laraib was able to see where the blood products are stored and learn the principles behind this storage. From blood bank, we continued Laraib's tour up to histology and finishing off in microbiology learning where all her swabs went.

This tour was a huge success with comments as below:

"I was really excited to be part of Harvey's Gang at the Children's. It was better than I could have imagined and score the experience 100/10"

A boy with Ewing's sarcoma, who has a fear of needles, got to find out more about blood samples:

My second successful tour was with 6-year-old Ollie, who was diagnosed with Ewing's sarcoma after going to the GP with a lump on his chest in January 2017. This condition meant that he must have regular blood samples taken to help monitor his treatment.

Ollie attended with his mother, to help him understand his condition and the laboratory process in the hope that Ollie would appreciate the need for blood tests and be less fearful of the needle! We later learnt that when Ollie returned for blood tests although it was still not without tears Ollie's mum reported that it was much better! She commented that the experience was "amazing and opened her eyes to the work that goes into this side of his treatment"

What will we do next?

Building on what we have already done, we will continue to invite our patients to improve their hospital experience from the laboratory. We have continued to spread the word as we are very much in the background of what the hospital does but are a vital piece of the care jigsaw. We are building momentum with our patient tours and aim to offer at least one tour per month. We are really proud of the work that has been put into Harvey's Gang and this has been recognised by the trust transformation team to which on 18th October 2018 we were awarded an acorn for the work we had done to date.

For more information about Harvey's Gang visit: harveysgang.blogspot.co.uk.

Michelle Wakelin (RNCB, SP)
Blood Transfusion Practitioner
Email: michelle.wakelin@nhs.net

Transfusion Spot Check Audit – Kettering General Hospital

Introduction

As a Transfusion Team we regularly audit various aspects of the transfusion process. This may be in the form of National Comparative Audits, or regional or local audits. These audits usually require us to have a look at patient notes and the transfusion prescription. We also may need to look at these documents for traceability purposes and incident investigation. While doing this we have often come across poor documentation compliance in some areas of the transfusion process.

We developed a quick and easy audit to help us to highlight areas of good and poor practice, and to show us which areas we needed to focus on to promote good practice and improved documentation. It is a real-time audit and is usually carried out while the patient is still being transfused. This means feedback can be given to the staff involved while they are still on shift and while they remember the transfusion.

Methods

We developed a proforma which fits on one side of A4 with 16 standards that should be fulfilled for each transfusion. Patients are selected at random from units scanned out of BloodTrack and each patient is only audited once in each month period. Any patient can be audited, but generally we don't select those who are in theatre or while the major haemorrhage policy is activated, to avoid getting in the way of staff working in these situations. We audit between 35 and 55 patients each month.

As it is a real-time audit we carry out the audit at various times of the day. If one of the Transfusion Practitioners (TP's) has a spare moment, we check BloodTrack to see if any units have been collected recently. Blood and platelets are audited, other products are only usually used in emergency situations at KGH. We then go to the location of the transfusion to carry out the audit. Twelve of the questions can be answered with a glance at the transfusion prescription form, especially if it has been completed correctly. The other four can be answered quickly and easily from elsewhere.

If any problems are found during the audit, for example really poor documentation, or critical steps missing (for example observations), we highlight to the member of staff administering the unit, and also the ward manager if appropriate. Occasionally a Datix is also required.

At the end of each month all of the data is collated and we feedback to all wards. We highlight good and less optimal practice, and provide all of the information on one side of A4 in the hope it is succinct enough to encourage people to read it.

The average time spent on the audit is around 20-30 minutes a day.

Results

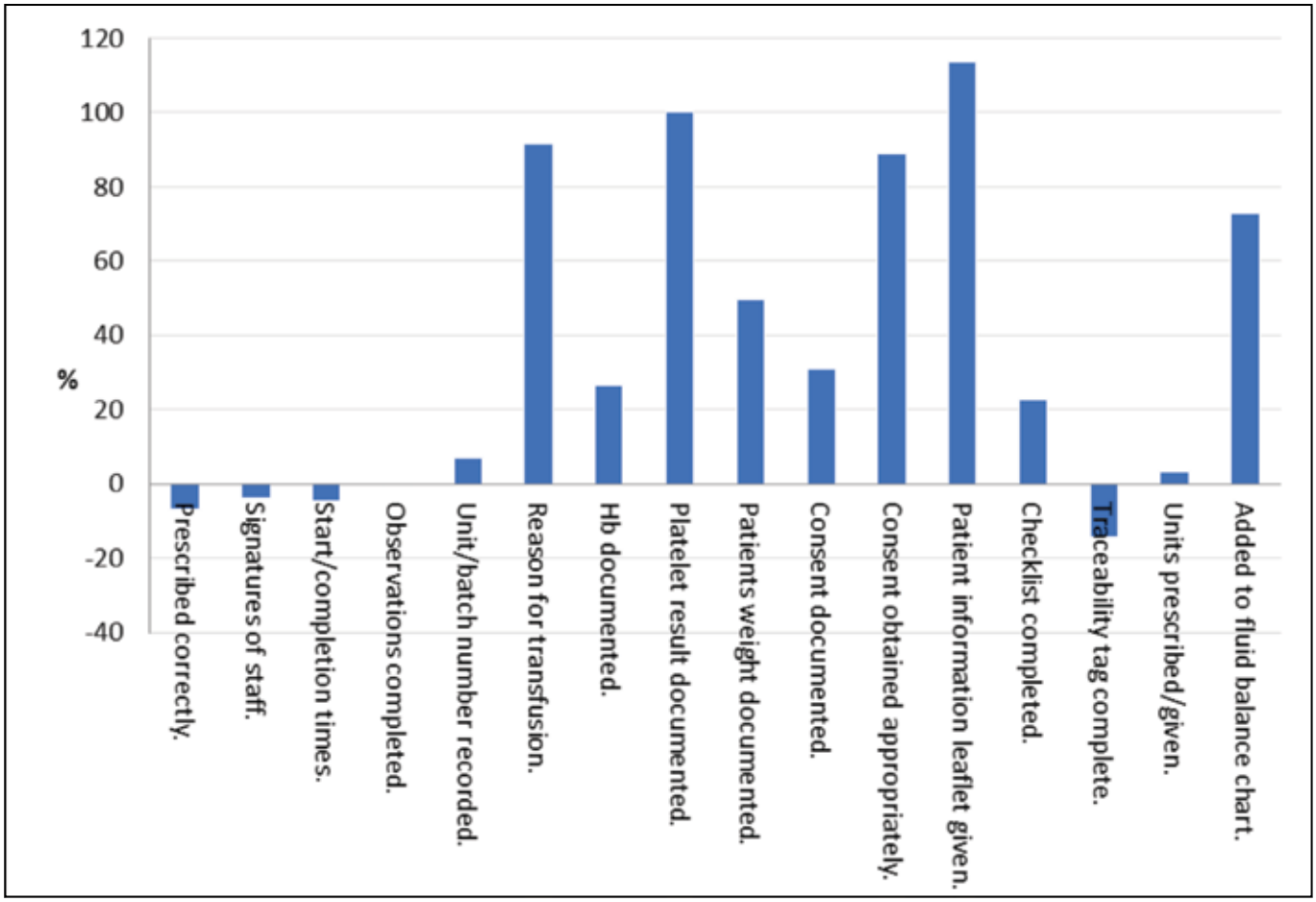
Table 1 shows the compliance to each of the standards over the first seven months of the audit. Those which are 90% or more are highlighted in green, less than 90% in red.

Table 1. Compliance with Spot Check Audit standards 2018

	Apr	May	Jun	Jul	Aug	Sep	Oct
Unit/s prescribed correctly.	100%	100%	100%	100%	98.1%	91.8%	93.1%
Signatures of staff checking/administering.	96.8%	100%	100%	100%	94.2%	100%	93.1%
Start/completion times.	90.3%	97.7%	90.1%	91.7%	92.3%	91.8%	86.2%
Observations completed.	93.5%	100%	97.7%	95.8%	98.1%	94.5%	93.1%
Unit/batch number recorded.	93.5%	86%	79.5%	87.5%	90.4%	97.2%	100%
Reason for transfusion documented.	37.8%	60.1%	38.6%	43.7%	63.5%	67.5%	72.4%
Hb documented – is prescription appropriate.?	63.3%	78.9%	83.8%	81.4%	70.2%	87%	80%
Platelet result documented?	0%	80%	33.3%	60.0%	88.9%	83.3%	100%
Patients weight documented.	32.3%	51.2%	59.1%	58.3%	65.4%	35.1%	48.3%
Consent documented.	71%	72.1%	83.7%	85.4%	76.9%	89.1%	93.1%
Was consent obtained appropriately?	45.4%	53.5%	60.5%	68.7%	64.0%	55.5%	85.7%
Patient information leaflet given out.	28.6%	29.0%	35.7%	40.7%	54.8%	24%	61.1%
Checklist completed (initials not just a tick.)	58.1%	71.4%	65.9%	70.8%	80.8%	64.8%	71.4%
Traceability tag complete and available for collection.	100%	100%	100%	95.8%	90.4%	64.8%	85.7%
Was the transfusion of RBC and number of units prescribed/given appropriate?	96.8%	100%	100%	100%	100%	100%	100%
Blood product volume added to fluid balance chart?	36.8%	57.1%	40.9%	40.0%	54.5%	50%	63.6%

Chart 1 shows the difference between compliance in April to that in October. Standards with lower compliance at the start have improved considerably. Those that were already relatively good to start with have remained relatively similar, other than the completion of the traceability tag.

Chart 1. Percentage change in compliance in Spot Check Audit standards 2018



Discussion

The results generally told us what we already knew, that some aspects of transfusion documentation were much better than others. Also that some wards are better than others at completing the documentation appropriately.

Most of the audit standards have shown a significant increased compliance over the past seven months. See Chart 1.

Documenting the reason for transfusion was highlighted initially as an area we needed to improve on, with only 37.8% compliance in April. We don't currently ask for indication codes, and therefore it is important that the reason for transfusion is documented in a clear and concise way and visible to anyone managing the transfusion, or requiring to know for audit or investigation purposes. This increased to 72.4% in October. We will be introducing indication codes on our revised transfusion prescription chart which we hope to introduce in early 2019.

Ensuring valid consent is obtained is also a key area we wanted to audit, and ensure it was being done appropriately. Several of the standards we audit are relevant to consent, and all of these have improved since we began the audit. When possible we checked with the patient that they had received a patient information leaflet. This often wasn't being done, sometimes members of staff said they forgot, sometimes they didn't know where the leaflets were kept on the ward, sometimes they had run out of leaflets on the ward. As a Transfusion Team we have made all wards aware that they should ensure they have stocks of leaflets available, and that they can easily get replacement copies from ourselves when they are running low. We also tell all staff in our mandatory teaching sessions of the importance of providing a patient information leaflet before the transfusion is given. This standard was classed as not applicable to long-term transfused patients as these patients are generally provided with information by their consultant when discussing treatment options and have a different consent documentation process.

Risk of transfusion associated circulatory overload (TACO) is a key area of focus in transfusion at the moment, especially following SHOT recommendations. Several of the audit questions are associated with this, and these had relatively poor compliance at the start of the audit in

April. Documented Hb and patient's weight can help to highlight those at higher risk of TACO, and the addition of blood to the fluid balance chart is an indicator of the patient being monitored appropriately. All of these have improved since April.

Generally, the basic information, that staff are used to doing for a variety of other reasons routinely, are well documented and complete (prescription, observations, start/finish times etc.). This information is also all on the front of the prescription form so perhaps easier to complete, and harder to miss. The documentation that wasn't as complete was mostly in the inner pages of the prescription (our prescription booklet is a folded A3 sheet, equivalent to four sides of A4). The vast majority of transfusions audited were also appropriate for the patient, which is very reassuring.

The audit has also highlighted how changes can affect compliance. On 1st September 2018 we changed to a new style of traceability tag. Although the process of signing to confirm the transfusion for both tags was the same, the compliance went down dramatically on introduction of the new tags. We have had to do more work to promote awareness and compliance is steadily increasing again. As a Trust we maintain 100% traceability, but the failure to follow procedure has meant a lot more work for us tracing up units and staff signatures.

Conclusion

The audit tool has been very useful to allow the Transfusion Team to see in black and white the key areas where improvement is required, and focus is needed.

Feedback given following the first few months' audits appears to have been taken on board by the wards and improvement can be seen following this.

Emily Rich
Transfusion Practitioner
Kettering General Hospital, NHS Foundation Trust
Email: EmilyL.Rich@kgh.nhs.uk

Safe Supplies: A Year of Change

Joint working of NHS Blood and Transplant and Public Health England

The joint NHS Blood and Transplant/Public Health England (NHSBT/PHE) Epidemiology Unit is responsible for the surveillance systems which report infections in blood, tissue, cell and organ donors across the UK and, as appropriate, infections transmitted by blood transfusion (TTIs). Blood donor surveillance started in the mid-1990s and has expanded as more screening tests have been added. NHSBT is responsible for collecting and issuing blood, tissues and some stem cells in England and responsible for organ donation across the UK. The Welsh Blood Service, Scottish National Blood Transfusion Service, Northern Irish Blood Transfusion Service and Irish Blood Service all provide data to the unit. Surveillance data to the end of 2017 are available here.

All donations are screened for markers of specific viral and syphilis infections which may be transmitted by transfusion or transplantation, in addition there are a number of other tests that may be carried out if a donor declares an infection risk, for example, a test for malarial antibodies if born in or travelled to a country where malaria is very common. Information about the current tests in use across the four UK blood services and the Republic of Ireland and the way that data is collected is available here.

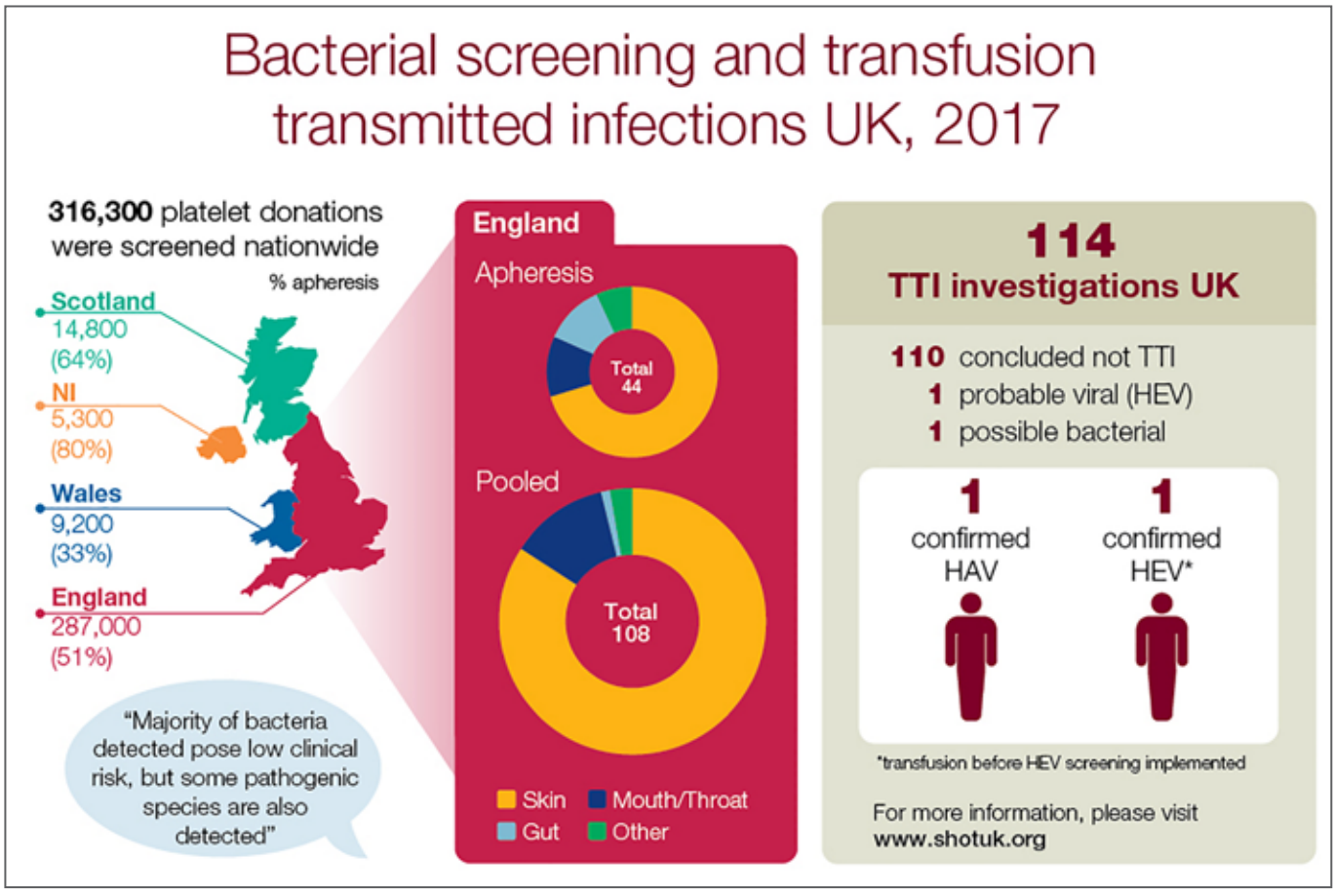
Blood donations which are positive for markers of infection are removed from the supply. The donor is informed and arrangements made for them to see their general practitioner or a sexual health clinic. During 2017 there were two major changes to the way in which donations were tested, in previous years all donations were tested for the presence of HTLV whereas from February NHSBT tested only donations from new blood donors and donations which were issued as granulocytes. Another major change was the move from testing at least 30% of donations for hepatitis E virus (HEV) to testing all donations for HEV.

In 2017, almost two million blood donations were screened across the UK. The majority of donations which were confirmed positive were due to either past or chronic infections, only a small number of newly acquired or acute infections were identified. The majority of recent infections were due to syphilis (23), three were acute hepatitis B infections and one was a recent HIV infection. All donors answer a series of questions at the time of donation – the donor health check questionnaire, to try and reduce the risk of donors with infection donating blood. Donor selection is used to reduce the risk of a donor with a very early infection donating and thus minimises the risk of an infection being missed on screening. The current

risk of releasing an infectious donation is less than 1 in 2 million donations. Further information about the risk of an early infection not being detected on screening can be found here.

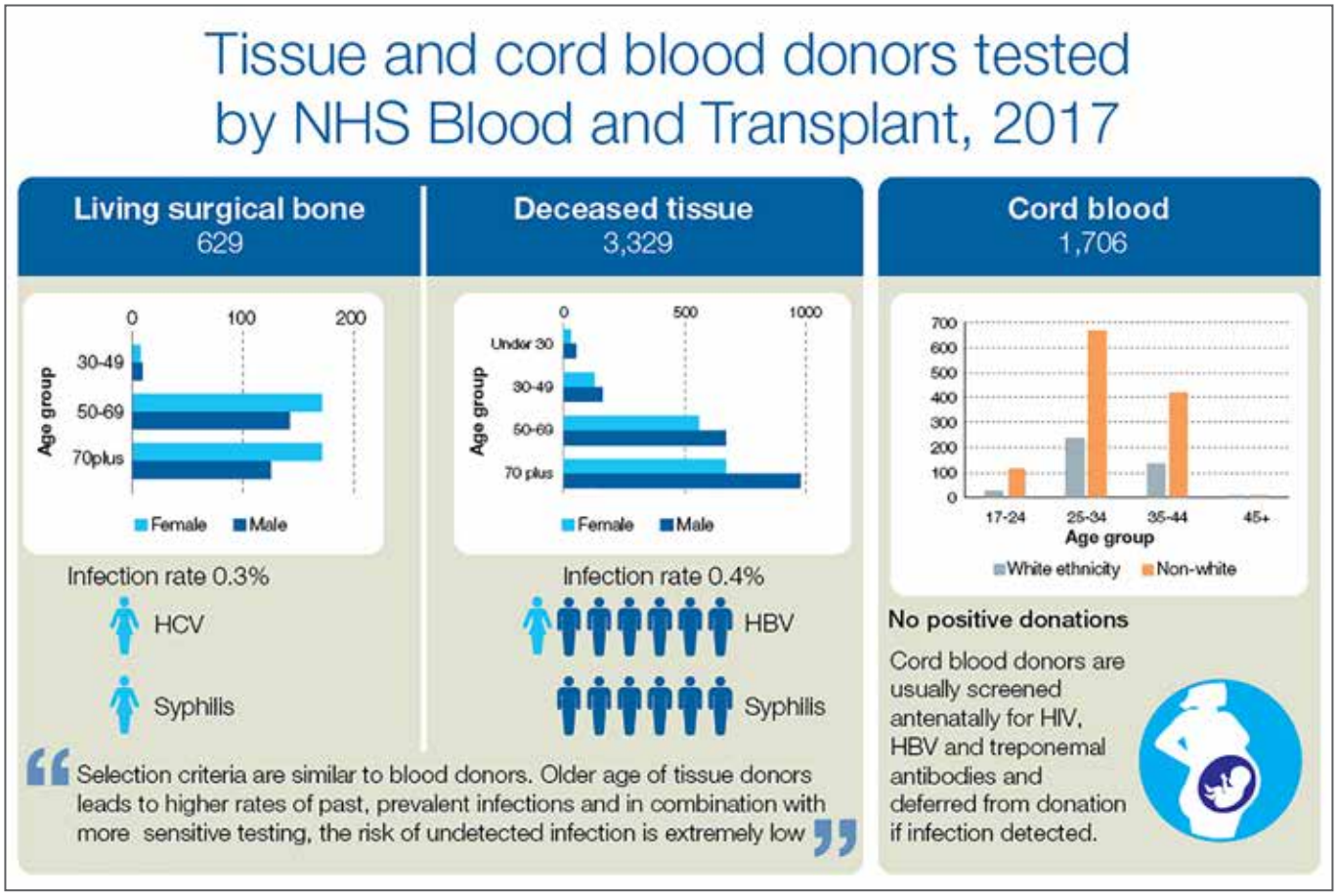
A combination of donor selection and donation testing is used to maintain the safety of the blood supply, blood donor selection criteria are kept under review as the national epidemiology of infections and test sensitivity changes over time. (https://www.gov.uk/government/groups/advisory-committee-on-the-safety-of-blood-tissues-and-organs), The Department of Health (DH) expert committee on the safety of blood, tissues and organs (SaBTO) is responsible for reviewing and making recommendations to certain donor selection criteria. During 2016 SaBTO reviewed the blood, tissue and cell donor criteria related to sexual behaviours, people who inject drugs and piercing events such as tattoos and body piercings and made a number of recommendations to government in 2017 (Infographics- LINK TO BOX [Safe supplies SaBTO timeline.pdf]). These recommendations took into account the current tests, epidemiology , ethical and behavioural considerations, reviewing available surveillance data collected by the epidemiology unit and our previous donor survey work looking at donor behaviours (link to SaBTO report https://www.gov.uk/government/publications/blood-tissue-and-cell-donor-selection-criteria-report-2017). In November 2017 the English, Welsh and Scottish blood services changed their donor selection criteria for donors with partners at increased risk, including men who have sex with men and commercial sex workers, to a three-month deferral since last sex. Recommendations relating to piercing events and injecting drug use could not be implemented because of the current law covering blood donation (https://www.gov.uk/government/publications/blood-tissue-and-cell-donor-selection-criteria-report-2017). The review and outcomes are summarised here.

All blood donations are screened for the presence of certain viruses and syphilis but only platelet donations are screened for the presence of bacteria because they are stored at 22°C, a temperature which may encourage the growth of bacteria. Following screening, platelets may have a shelf life of up to seven days; any platelet packs reactive on screening are removed from the supply and further tested. Donors may be contacted if their platelet donation grows bacteria which may indicate an underlying illness. The majority of bacteria detected on screening are unlikely to cause harm and are anaerobic; more significant bacteria detected are associated with the mouth and throat and carriage in the gut, or the skin such as *Staphylococcus aureus*.

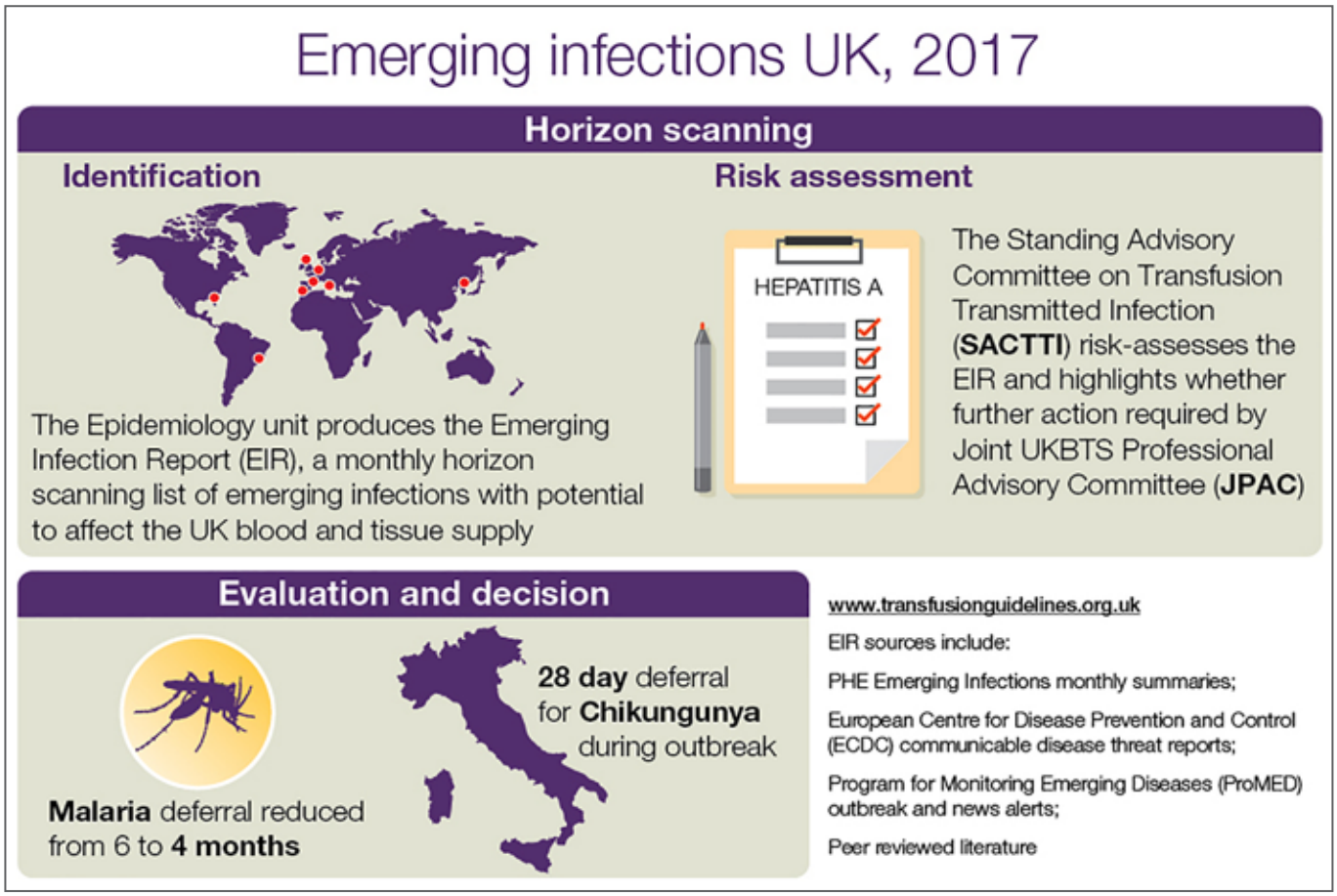


All transfusion transmitted infections (TTIs) reported to the blood services are investigated. In the case of viral infection this may be some years after the transfusion was given. More information on TTIs can be found on the Serious Hazards of Transfusion (SHOT) website. During 2017 one possible bacterial TTI and one probable HEV TTI, associated with an unscreened unit, were reported. Two TTIs were confirmed, one hepatitis A infection associated with a platelet transfusion linked to the ongoing hepatitis A outbreak in the general population and a HEV transmission associated with a pooled platelet transfusion when selective screening was in place, this donation had not been screened.

The blood services in the UK also collect, test and supply tissues and stem cells. Tissue donors may donate surgical bone as living donors at the time of hip replacements, whereas other tissues and corneas are collected from deceased donors. NHSBT collects cord blood from pregnant women attending hospitals around London. In recent years there has been a decrease in the number of living donors donating bone due to good stock levels. In 2017, two donors tested positive, one HCV and one syphilis positive. Deceased donors have highest rates of positivity which may reflect their age; six were positive for syphilis and seven HBV. During 2017 no cord blood donors tested positive, antenatal screening will select out women positive for HBV, HIV and or syphilis.



Another role of the unit is in horizon scanning for infectious diseases, particularly new and emerging infections, in conjunction with colleagues across PHE and wider blood services across the world. Data contribute to risk assessments and may result in additional tests or changes to donor selection criteria being implemented for example spread of Chikungunya in Italy resulting in a donor deferral being implemented.



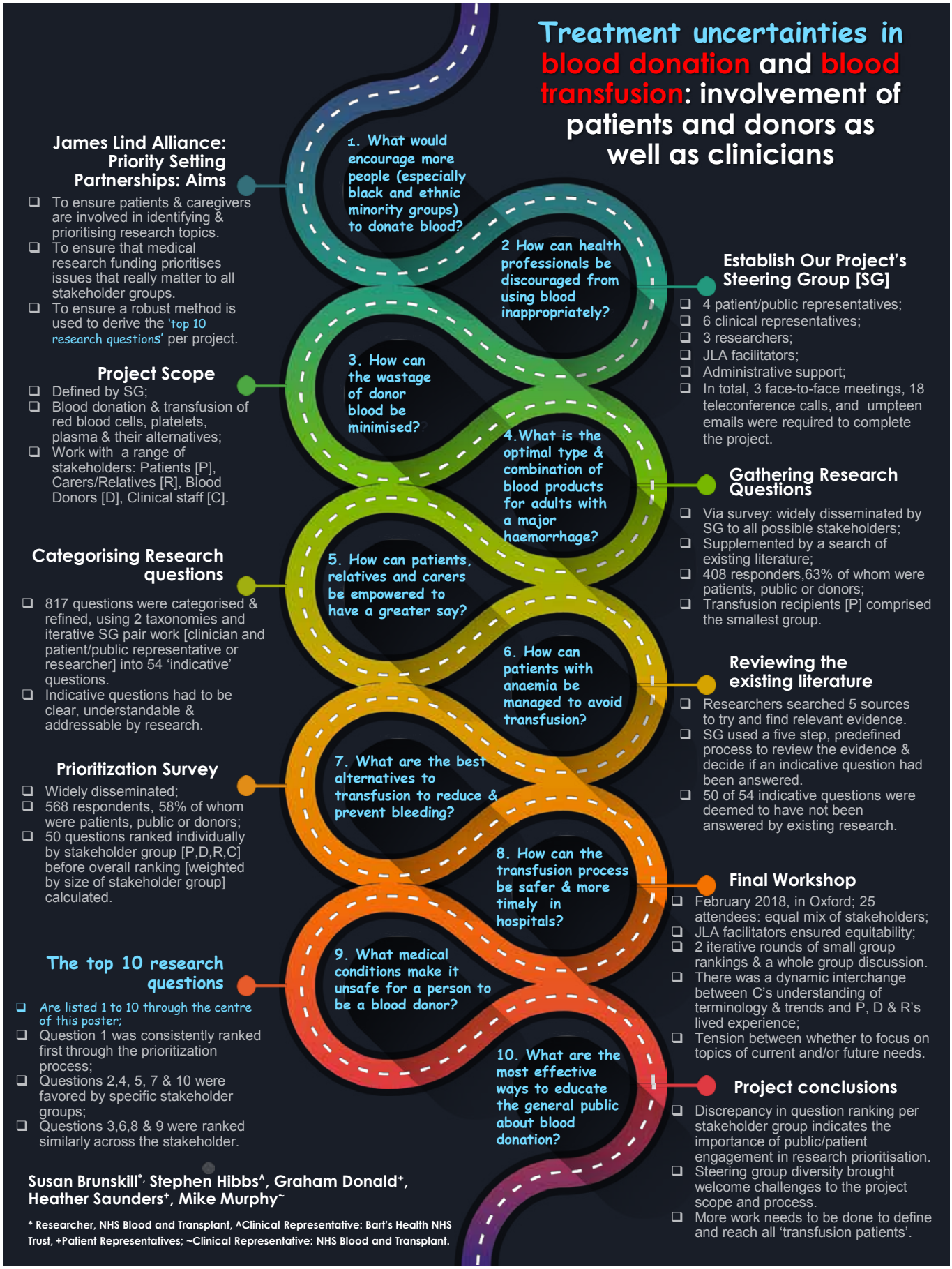
As well as standard surveillance of blood, tissue and organ donors, the unit also manages more specific work areas including the HTLV register which was established in 2004 following the introduction of routine testing for HTLV by NHSBT in 2002. This is a collaboration between PHE, Imperial College and NHSBT and is one of only two registers still recruiting patients in the world. Blood donors diagnosed with HTLV are invited to join the register at which point they are usually in good health and do not have any symptoms of HTLV. Patients on the register are contacted at regular intervals and asked about their health and any symptoms. To date we have 750 years of follow up data from 200 asymptomatic members. Data from the register will be used to inform wider treatment and management and understanding of the history of patients in the UK with HTLV. (INFOGRAPHIC- LINK to BOX [Safe supplies HTLV.pdf])

The Transfusion Medicine Epidemiology Review (TMER) is another more specialist surveillance system in collaboration with colleagues at the UK National CJD Research and Surveillance unit. The TMER was set up in 1996 to look for evidence that any form of Creutzfeld-Jakob Disease (CJD) may have been transmitted via the blood supply. Liaising closely with the UK National CJD Research and Surveillance unit, the study instigated UK blood service searches for donations made by people diagnosed with variant CJD (vCJD). Any recipients were then identified and flagged so that if they should develop vCJD the link to transfusion would be made. Where any vCJD donors were also identified to be recipients of blood their donors in turn were flagged. A similar process was also followed for other types of CJD where the family reported blood donation. In this way the TMER linked four recipients, three with clinical vCJD disease and one pre-clinical case to donations made by three donors who later developed vCJD and thus proved that transfusion is one route for vCJD transmission. No evidence has yet to be found that other kinds of CJD can be transmitted via transfusion. (INFOGRAPHIC- LINK to BOX [Safe supplies TMER timeline.pdf])

The Blood Borne Virus unit at PHE works closely with the epidemiology unit and colleagues within the wider NHSBT on issues that have an impact on the safety of blood, tissues and organs. In 2017, topics included HEV in donors and recipients, characterising hepatitis viruses and continuing to develop new tests for implementing in NHSBT and elsewhere. (INFOGRAPHIC- LINK to BOX [Safe supplies BBVU.pdf])

For more information please contact epidemiology@nhsbt.nhs.uk

Su Brailsford
Consultant in Epidemiology and Health Protection
NHSBT, Colindale
Email: su.brailsford@nhsbt.nhs.uk



Susan Brunskill
Senior Information Scientist
NHSBT, Oxford
Email: susan.brunskill@nhsbt.nhs.uk

Building Evidence Libraries: From Filing Cabinet to Screen

The Systematic Review Initiative (SRI) is a research group set up to strengthen the evidence base in transfusion medicine. Led by Professor Mike Murphy and funded by the four UK Blood Services, it has published over 90 systematic reviews in the past 16 years. Since 2007, it has also published the Transfusion Evidence Library, a database of all the systematic reviews (since 1980) and randomised controlled trials (since 1950) published in Transfusion Medicine.

The Transfusion Evidence Library started with a filing cabinet of systematic review and randomised controlled trial abstracts, painstakingly hand searched and photocopied from print journals and conference proceedings, and then stored for the SRI's reference. As the group grew and technology advanced, the SRI wanted to make this resource available to others in the transfusion field and beyond, so the Transfusion Evidence Library was launched and hosted on the Joint United Kingdom (UK) Blood Transfusion and tissue transplant Services Professional Advisory Committee website, allowing anyone who needed to, to locate these abstracts without duplicating the hand searching effort, or needing a key to the filing cabinet!

There was some way to go to unlock the full potential of the Transfusion Evidence Library, however. We built links with a similar resource, the Transplant Library, which led us to find a partnership with our current publisher, Evidentia Publishing. The revamped transfusion Evidence Library was launched in October 2013 on its own URL, www.transfusionevidencelibrary.com and expanded to include all transfusion-related systematic reviews, randomised controlled trials and economic studies, meeting strict criteria. The new interface was much more searchable and user friendly, and the new partnership opened up many more possibilities. Clinical Commentaries were launched on the site, and a free, expert-curated monthly alerting service launched. Today this alert has around 12,000 subscribers worldwide.

Ten years on from the Transfusion Evidence Library's first electronic incarnation, the SRI was looking to draw on our experience in electronic libraries and broaden the reach of our research activities. Since we had close links with the Transplant Library, which covers evidence in solid organ transplantation, the obvious area missing was stem cell transplantation: a key focus for NHSBT and our other funding bodies, and an area where we could really add value by collecting and collating the evidence base.

We formed a steering group, which was chaired by Professor Charles Craddock, secured funding from the NIHR Biomedical Research Centre (BRC) and UK Forum and set to work developing the new product. Our goal was to collect all the relevant evidence in haematopoietic stem cell transplantation into one user-friendly database, indexed by subject-specific keywords and fully searchable on both desktop and mobile devices. We also wanted to make it open access from the start. In April 2018, Stem Cell Evidence was launched, along with a monthly alerting service, the Stem Cell Evidence Alert, keeping subscribers up-to-date with the highest quality references each month. Plans for the future include Clinical Commentaries, along the same lines as the ones offered on Transfusion Evidence Library, and Patient/Problem Intervention Comparison Outcome (PICO) summaries of key articles in the field.

To find out more, please visit www.stemcellevidence.com where you can search the library and sign up for the Stem Cell Evidence Alert. You can also follow both libraries on Twitter @transfusionlib and @evidencestemc.

Catherine Kimber,
Assistant Information Specialist
(Systematic Review Initiative)
NHSBT, Oxford
Email: catherine.kimber@nhsbt.nhs.uk

Susan Brunskill
Senior Information Scientist
NHSBT, Oxford
Email: susan.brunskill@nhsbt.nhs.uk

Carolyn Doree
Systematic Review Initiative
NHSBT, Oxford
Email: carolyn.doree@nhsbt.nhs.uk

Strengthening the effectiveness of Organ Donation Committees

Organ Donation Committees (ODC) were established by a recommendation of the Organ Donation Taskforce in 2008. The Taskforce vision was that donation committees, a coalition of interested parties including clinical staff, donor families and lay people, would be the principle mechanism for challenging and overcoming those hospital-based obstacles to donation which the 2008 report recognised as holding back donation levels in the UK.

What the Taskforce recommendation did was make organ donation a local concern. It led to the establishment of over 160 organ donation committees, covering every UK acute hospital and founded upon a core 'triumvirate' of Specialist Nurse for Organ Donation (SNOD), Clinical Lead for Organ Donation (CLOD) and ODC Chair. On this local triumvirate of individuals, the UK success story in donation and transplantation was built. An unprecedented 95% increase in deceased donation has been achieved since the Taskforce baseline year (from 809 deceased donors in 2007/08 to 1574 in 2017/18).

The original Taskforce terminology used the term 'non-clinical champion' to describe the Organ Donation Committee Chair. If we are to realise our ambition to be world class in organ donation and transplantation the need for organ donation champions in UK hospitals remains as pressing now as it was in 2008.

To stay effective however, especially in an ever-changing NHS, it is important to regularly revisit established structures and ways of working. SNOD and CLOD roles have been recently reviewed and changes made. In 2017, two important reviews of the role of organ donation committees were carried out. The first was in Scotland and led by the Scottish Organ Donation Team and Government, and the second was in England and led by medical students from Imperial College London. The work of these two groups led directly to a two-day NHSBT improvement event in April 2018 on 'Strengthening the effectiveness of our Organ Donation Committees'.

Themes and Recommendations

Eight themes were identified during the improvement event and key recommendations were made which are set out in Table 1. Current work is aimed at delivering on these recommendations.

The ODC Chair role is a voluntary position and relies on the dedication of those who willingly give their time freely to promote organ donation. From the work of the two reviews into Organ Donation Committees it was clear that agreeing greater role clarity for ODC Chairs would be important, both by providing guidance to those recruiting Chairs and giving potential Chairs a better way of judging if the role and the required commitment was right for them. One proposal was, for the first time, to advise on a length of service. As for CLODs, the recommended term of appointment of ODC Chairs would be for three years, renewable for a further term, but with no prohibition on the post-holder reapplying thereafter.

A 2014 survey revealed that ODC Chairs come from a diversity of backgrounds, most having no healthcare background. This certainly fits the Taskforce's vision of non-clinical champions but means that for many new chairs their knowledge and influence within rigid hospital hierarchies may be limited. The improvement event did not wish to see the breadth of ODC Chairs diluted but considered it important to offer new Chairs the best welcome and support. For this reason, in addition to the annual Chair Induction Event, a welcome package for Chairs will be created and the current Chair handbook updated.

The ODC Chairs remain one of the most valuable resources NHSBT can call upon. Many Chairs have close community ties and influence. It was identified that we should do more to draw on the wisdom and expertise of our Chairs. What was less clear was how to do so.

In Scotland and the Midlands an ODC Chair has been appointed to act as a regional Chair. This Chair acts as a link person for communication and mentors the region's local chairs, as well as helping to ensure that the biannual regional collaborates meets the needs of Chairs. This model became a key recommendation from the improvement event. In the creation of this new role the successful, local triumvirate model of SNOD, CLOD and ODC Chair, could be replicated at a regional level with a regional manager, regional CLOD and regional Chair.

During the improvement event it became clear from sharing experiences across the UK that some committees are, unfortunately, not functioning. This may be the result of a number of reasons including retirement, sickness or a lack of prioritisation by hospital management. One outcome from the improvement event is the development of an 'emergency' committee structure to ensure that the key functions of the committee can continue until the committee can be re-established.

In 2018, donor reimbursement was replaced by Donor Recognition Funding. This was more than just a name change but a terminology better suited to an NHS where organ donation is a usual part of end of life care. A promise was made by NHSBT to seek to direct these funds to the ODC, thereby ensuring funding is targeted where

it will be of most benefit to the organ donation service. The improvement event recognised that it is difficult to guarantee this occurs as once NHSBT has paid over the money to local hospitals it loses control over how the money is used. It was proposed that accountability for these funds be strengthened by requiring ODC Chairs to confirm annually that their ODC was able to *advise* on how the money was used and by incorporating this requirement into a planned updated memorandum of understanding between NHSBT and local hospitals. This would have the additional benefit of raising the profile of ODCs in hospitals.

One of the surprising findings from the Imperial Medical Student review was that ODC Chairs wanted more feedback from the region on how they were doing as a committee. While falling under the theme of performance, it was proposed that the use of templates for committee meetings could help create a shared structure which would allow committees to compare themselves more easily with their peers. This model might also allow for promotional activities and initiatives to be disseminated rapidly and widely and could assist in achieving a related ambition to improve communication from NHSBT to ODCs.

The regular attendance of team managers at ODC meetings appears to be appreciated and should continue but the new role of regional Chair may assist in providing ongoing encouragement for local committees. A final recommendation from the improvement event was to create a landing site on the ODT website as a first port of call for Chairs. This would provide a place where information of relevance to Chairs can be easily accessible and regularly updated.

Conclusion

NHSBT and the UK as a whole owe a tremendous debt of gratitude to the men and women who over the last ten years have given so generously as Chairs of local organ donation committees and as committee members. Going forward we still need you. We trust that the recommendations that came from the improvement event do, as the title says, strengthen your effectiveness.

Table 1. Themes and Recommendations from the Rapid Improvement Event, April 2018.

Themes	Key Recommendations
1. ODC Chair recruitment and selection	• Create a clear role profile • Appoint regional Chairs
2. ODC Chair welcome package and training	• Develop a welcome package • Update the Chair handbook
3. Recognise established ODC chairs	• Encourage established Chairs to mentor new chairs • Seek the wisdom from established Chairs more
4. Reporting structures for ODCs	• Develop an emergency committee structure • More closely link donor recognition monies to ODCs • Include ODCs into the updated NHSBT MOU with hospitals
5. Raise the profile of ODCs in hospitals	• Investigate ways to grow recognition of the work ODCs do for hospitals
6. Performance metrics for ODCs	• Pilot use of ODC meeting templates and reporting. Example headings: Performance, Policy, Education, Promotion • Pilot incident reporting for missed opportunities
7. Communication with ODCs	• Create a landing page on ODT website designed for Chairs • Include Chairs in real time donation, activity updates from their hospital and missed opportunity communication • Continue to encourage Team Manager attendance at ODC meetings • Regional Chairs to assist with information dissemination
8. Organ donation promotion	• Raise awareness of ODT promotions hub • Minimal promotional activities for donation week to be defined

Corresponding author:
dale.gardiner@nhsbt.nhs.uk

Amanda Gibbon
Organ Donation Committee Chair Representative to the National Organ Donation Committee

Joanne Allen
Performance and Business Manager, Organ Donation and Transplantation
NHSBT, Bristol
Email: joanne.allen@nhsbt.nhs.uk

Liz Armstrong
Lead Nurse – Service Development, Organ Donation and Transplantation
NHSBT, Birmingham
Email: liz.armstrong@nhsbt.nhs.uk

Jill Featherstone
National Professional Development Specialist –Medical Education Lead, Organ Donation and Transplantation
NHSBT, Newcastle
Email: jill.featherstone@nhsbt.nhs.uk

Ratan Gor
Doctor at Chelsea and Westminster Hospital
BSc student at Imperial College London – Organ Donation Committee Effectiveness Team

William Saunders
Organ Donation Committee Chair,
Burton Hospitals NHS Foundation Trust

Geeth Silva
Medical Student at Barts and the London Medicine and Dentistry
BSc student at Imperial College London – Organ Donation Committee Effectiveness Team

Julie Whitney
Lead Nurse – Service Delivery, Organ Donation and Transplantation
NHSBT, Bristol
Email: julie.whitney@nhsbt.nhs.uk

Dale Gardiner
National Clinical Lead for Organ Donation
NHSBT, Bristol
Email: dale.gardiner@nhsbt.nhs.uk

Peter Martin
Organ Donation Committee Chair
Northampton General Hospital NHS Trust

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Corneal Transplants – helping patients see what they can only imagine

Benjamin Bates had two corneal transplants as a baby, after being born with a very rare condition that stopped the front of his eyes developing properly.

Benjamin, 4 years old from Huddersfield, was born with Peters anomaly, an abnormality of the eye which develops at the embryonic stage. It results in the central area of the cornea being opaque. The iris has holes and may be stuck to the back of the cornea and the lens. In some cases, the lens is also opaque and this may be stuck to the back of the cornea. He also has severe glaucoma.

Sarah, his mother said: "The second I saw Benjamin I knew he was blind. Both of his eyes were opaque, there was no visible pupil."

Sarah said: From the day Benjamin was born I knew the only hope he had of gaining any vision would be to go down the transplant route".

Benjamin – A couple of days old.

At five months old he had his first cornea transplant in his right eye, a DSEK (Descemet Stripping Endothelial Keratoplasty) procedure where only one layer of the cornea is replaced, which failed, followed by a full cornea transplant when he was seven months old.

When he was eight months old his family transferred his care to Manchester Royal Eye Hospital. Benjamin has had 13 surgical procedures and countless hospital appointments. He still needs eye drops every hour. Sarah said: "He doesn't try and fight against them anymore, he even tries to do them himself.

Benjamin – Day after Cornea Transplant

Today, Benjamin is registered blind. Doctors said a transplant in his left eye would fail, and he only has light perception in that eye. He can see colours with his right and track objects that are close to him. Sarah said: "It's still hard to tell exactly what his vision is as he's still so young. He can track objects which are close to him. He loves to paint and colour. He's recently started showing an interest in television too, even though he has to sit with his nose almost touching the screen!

"As Benjamin's eye condition is so complex he is going to need life-long treatment. Benjamin has had a couple of infections in his donor cornea, which have caused permanent damage, and it is no longer functioning as it should. The likelihood is that Benjamin will need another transplant in the future."

She added: "I am eternally grateful to the donors. They have totally transformed my little boy's life. I won't ever take for granted the precious sight Benjamin has. He doesn't see like me or you, but he can see. Watching him reach out to touch something or colour a picture, these are things I never knew I'd have. I feel very thankful."

Many people can donate their eyes for cornea transplants when they die, including people with most types of cancer. The cornea is the clear tissue on the front of the eye that help the eye to focus light. The sclera which is the white part of the eye, can also be donated to help people but the eye is never transplanted whole.

NHS Blood and Transplant needs 90 eye donations a week to meet the demand for sight saving transplants but there is a regular shortfall in donations. The shortage leads to longer waits for transplants.

In the last year, 3,504 people in England have had their sight restored through cornea transplants. One donor can help restore or improve the sight of up to ten people and help patients see what they can only imagine.

Sarah Bates

Benjamin – Summer Holiday 2017

Victoria Parsonson's eyesight was saved by a cornea donor, which enabled her to go on to become a doctor.

Victoria, 35, from Harborne, Birmingham was diagnosed with keratoconus, a progressive eye disease which causes distorted and blurred vision when she was 16 years old.

A dedicated student with dreams of a career in medicine, Victoria's eyesight continued to decline and by the time she was sitting her A Levels she was short sighted.

Victoria said, "I was using broadsheet style exam papers in order to read the text. Luckily, I passed my exams and I was so happy I had secured a place at Birmingham Medical School, but my eyesight was getting worse and I was legally blind. I was devastated, all I ever wanted to be was a doctor."

After visits to the optician, Victoria was eventually referred to an ophthalmologist at Bristol Eye Hospital and a series of tests were carried out.

Victoria said, "I was given special glasses but unfortunately they didn't help. I was then given contact lenses, but my vision still remained poor as they didn't fit correctly. After trying both these options I was informed that I would need a cornea transplant. At the time I was scared, I felt all my years of dedication to my education was hanging in limbo."

Victoria's Ophthalmologist was aware of her pending place at Medical School and supported her fully throughout the process while on the waiting list for a year. In 2001 Victoria had the cornea transplant at Bristol Eye Hospital.

Victoria said, "I was very apprehensive. I had so much relying on this surgery and I had so many questions. I was constantly asking myself, will it work? I also kept thinking of the donor's family and how they were feeling. I was privileged, and I found it amazing that someone was giving me the gift of sight. My feeling was very mixed."

Victoria describes the first time that she could see clearly, "My eye was bandaged for the first 24 hours, but the first time that this was removed, it was absolutely amazing. I could see the detail of someone's face. I struggled previously to see someone's face when they were standing across a room

After a gap year, Victoria was able to take up her place at Birmingham Medical school in September 2002 to begin her career in medicine.

In 2008 Victoria graduated from Birmingham Medical School as a doctor. She specialises in paediatrics and after a few years of work in the UK, Victoria went to Africa in 2011 volunteering at a hospital helping children.

Victoria said: "Having a transplant completely changed my life. It helped me to help other people. I like to think that I have been given the gift of sight and I hope in my career I am able to also give something back to people. My donor and their family are amazing and I can't thank them enough for what they have done for me."

CPD Questions

1. Harvey's Gang:

a) Was founded by Harvey in 2014.

b) Was founded by Malcolm Robinson in 2018.

c) Was founded by Malcolm Robinson in 2014 in memory of Harvey Baldwin.

d) Was initially founded at Birmingham's Women's and Children Hospital.

2. Harvey's Gang:

Invites ill youngsters to:

a) Have special lessons on pathology laboratories.

b) Be told about pathology laboratories.

c) See pathology laboratory from outside.

d) To tour pathology laboratories.

3. Harvey's Gang:

a) Only involves Blood Bank.

b) Only involves haematology and Blood Bank.

c) Tours are specifically tailored to the individual Child's interest and fears.

d) Never involves Microbiology.

4. Transfusion Spot Check Audit:

a) Was part of a National Comparative Audit.

b) Was a real-time audit.

c) Required at least two hours per day to complete.

d) Required information from many different sources.

5. Transfusion Spot Check Audit:

a) Provided unexpected results.

b) Reason for Transfusion was well documented.

c) No improvement in documentation of reason for transfusion occurred in audit period.

d) Reason for transfusion was poorly documented in early part of audit.

6. Transfusion Spot Check Audit:

a) Early feedback of poor documentation or missing critical step had a beneficial effect.

b) There was no change detected.

c) TACO was ignored.

d) Prescription booklet was found to be perfect.

7. Safe Supplies:

The following changes occurred in donation testing during 2017

a) From February, NHSBT tested all donation for HTLV.

b) From February 2017, HTLV is tested only in donations from new blood donors and those issued is granulocytes as well as all donations are tested for HEV.

c) About 30% of donations for HTLV.

d) From February NHSBT only test 30% of donation for HTLV.

8. During 2017, there was:

a) No possible bacterial infected units.

b) One possible bacterial infected unit.

c) Two possible bacterial infected units.

d) Three possible bacterial infected units.

9. Organ Donation Committees (ODC):

Some being established in 2008, ODCs – along with SNOD and CLOD – have helped in increased decreased donation by

a) 95%.

b) 85%.

c) 65%.

d) 45%. Over the last ten years.

10. Corneal Transplant:

NHSBT require, each week, the following number of eye donation

a) 20.

b) 150.

c) 60.

d) 90.

Question 1

A 30-year-old woman with underlying Sickle Cell Disease (SCD) presented with shortness of breath

Hb was 5.8 g/L; Ferritin tested a week ago was 160 ng/mL (range 13 – 150 ng/mL).

DAT was negative and antibody screen negative on admission.

The patient received two units of RhK matched compatible RBC units and post-transfusion Hb was 8.9 g/L.

Five days later the patient presented with a fever, joint pain and Hb was 6 g/L with laboratory evidence of hemolysis. On admission, relative reticulocytopenia was noted. DAT was negative and no new RBC alloantibodies were identified. Hb further dropped to 4 5. g/L the next day.

Questions:

1. What is the possible diagnosis?
2. What is the diagnostic criteria of this diagnosis?
3. What further investigations would you organize to support the diagnosis?
4. What are the causes of reticuloctopena?
5. How would you provide further transfusion support for this patient?
6. What are the pathogenesis of Post Transfusion Hyperhaemolysis Syndrome (PTHS).

Question 2

Diagnosis of acute Post Transfusion Hyperhemolysis was made and as the patient was symptomatic additional transfusion of two RBC units were provided with methylprednisolone and IVIG cover

Hb further dropped to 3.2 g/L. After three days of immunosuppression, persistent symptomatic anaemia prompted another transfusion. Transfusion was discontinued after 50 ml as the patient complained of generalized pain and Hb further dropped to 2.1 g/L. Post transfusion samples: Both DAT/antibody screen remains negative. Patients with severe acute PTHS i) further transfusion may also further precipitate haemolysis ii) **but more importantly may die of profound anaemia if transfusion support not provided.**

Questions:

1. What is the diagnosis?
2. How would you further manage this case?
3. What is the role of Rituximab and therapeutic efficacy in PTHS?
4. What is the role of Eculizumab[20,21] and therapeutic efficacy in PTHS?

Answers to Clinical Case Studies

Question 1

1. What is the possible diagnosis?

Post-Transfusion Hyperhaemolysis Syndrome (PTHS) in a patient with Sickle Cell Disease (SCD).

2. What is the diagnostic criteria of this diagnosis?

PTHS. The term "syndrome" was first coined by Professor Petz in 1997.[1]

The following are the diagnostic criteria based on Petz *et al*:

1. Acute/delayed haemolytic transfusion reactions despite providing cross matched compatible units.
2. Post transfusion Hb dropped below pre transfusion level.
3. A marked reticulocytopenia. (A significant decrease from the patient's usual absolute reticulocyte level).
4. Not like classical DHTR additional transfusion may further exacerbate and may cause death.

i) **Acute/delayed haemolytic transfusion reactions despite providing phenotypically matched/ cross matched compatible units.** (With or without forming additional alloantibodies).[1]

PTHS is later classified into:

- **Acute and delayed forms.** This was based on analysing 29 cases from seven different publications. In that review 16 classified as acute form and 13 as delayed form.
- **Acute PTHS:** this usually occurs less than seven days' post-transfusion. DAT is usually negative. Serological investigation of follow-up samples may not reveal the formation of new red cell alloantibodies.
- **Delayed PTHS:** this usually occurs more than seven days' post-transfusion. DAT is positive. New alloantibodies identified.[2]

ii) Danee *et al*[3] have provided the case summary of eight SCD patients from their centre and an antibody profile of 49 SCD patients presented with PTHS in a recent review article (a total of 55 cases). No alloantibodies detected in post-transfusion sample (31 patients: acute form PTHS) (23 with additional new alloantibodies: delayed form) and in the remaining three patients, autoantibodies detected in post transfusion samples.

iii) There were six PTHS cases with underlying SCD reported in 2016 annual SHOT report[4]. No antibodies or no new additional antibodies detected in 5 cases, (acute form) all of the cases developed hyperhaemolysis after receiving Rh K matched and cross matched compatible units.

The patient developed a more severe anaemia after transfusion (i.e. post-transfusion Hb level lower than pre-transfusion level) and suggested that not only the transfused cells were haemolysed.[1]

a) The destruction of both donor RBC and patient's RBC were later substantiated by serial analysis of urine by high performance liquid chromatography demonstrating both the HbS and HbA in the urine[5] and

b) King *et al*[6] also proposed that sequential quantitation of HbA% and HbS% in the patients' blood sample assist to capture the trajectory of haemolysis.

A marked reticulocytopenia (a significant decrease from the patient's usual absolute reticulocyte level) during haemolysis[1] and recovery manifested by a rise in reticulocyte count.

Additional transfusion, even with antigen-matched cross match-compatible units, may further exacerbate the anaemia and it may become life-threatening or even cause death.[1]

3. What further investigations would you organize to support the diagnosis?

High serum ferritin values are typical of an acute phase response and consistent with abnormal macrophage activation and have been used as a biomarker of macrophage activation.

Therefore, it has been recommended to measure serial ferritin level as a disease marker in post-transfusion hyperhaemolysis in SCD and documented that the serum ferritin levels rise during haemolysis and drop with an improvement in Hb level.[7,8]

4. What are the causes of reticuloctopena?

In classical DHTR there is a compensatory reticulocytosis in association with haemolysis. In PTHS the patient presented with reticulocytopenia at the time of haemolysis and recovery manifested by a rise in Hb and reticulocytosis.

In view of this low reticulocyte count

i) Petz *et al*[1] have proposed "suppression of erythropoiesis theory"

ii) Win *et al*[5,9] have studied the bone marrow aspirate conducted to a SCD patient presented with PTHS (recorded reticulocytopenia at the time of marrow study): showed erythroid hyperplasia. It was concluded that the reticulocytes are destroyed by peripheral consumption: adhesion between sickle cell reticulocytes and macrophages via α4 β1/ VCAM-1 mechanism.

Danaee *et al*[10] have done the bone marrow study in a patient with underlying HbH presented with PTHS and demonstrated erythroid hyperplasia, supporting reticulocytes are destroyed peripherally.

5. How would you provide further transfusion support for this patient?

If possible transfusion should be withheld as additional transfusion may further exacerbate haemolysis and it may become life-threatening or even cause death. Petz *et al* recommended to "try oral prednisolone 1-2 mg/kg/day and to monitor closely."

In symptomatic patients with severe PTH, further transfusion is unavoidable and additional transfusion has been successfully provided with **IVIG/steroids** cover. IVIG and steroids are the first line therapy for severe PTHS.[3,9,11,12,13,14] Recent reviews[3] showed that 50% use the low dose regime (0.4 g/kg/day x 5 days) and the remainder 50% use high dose regime (1g/kg/ day for 2 days) (A total dose of 2g/kg).

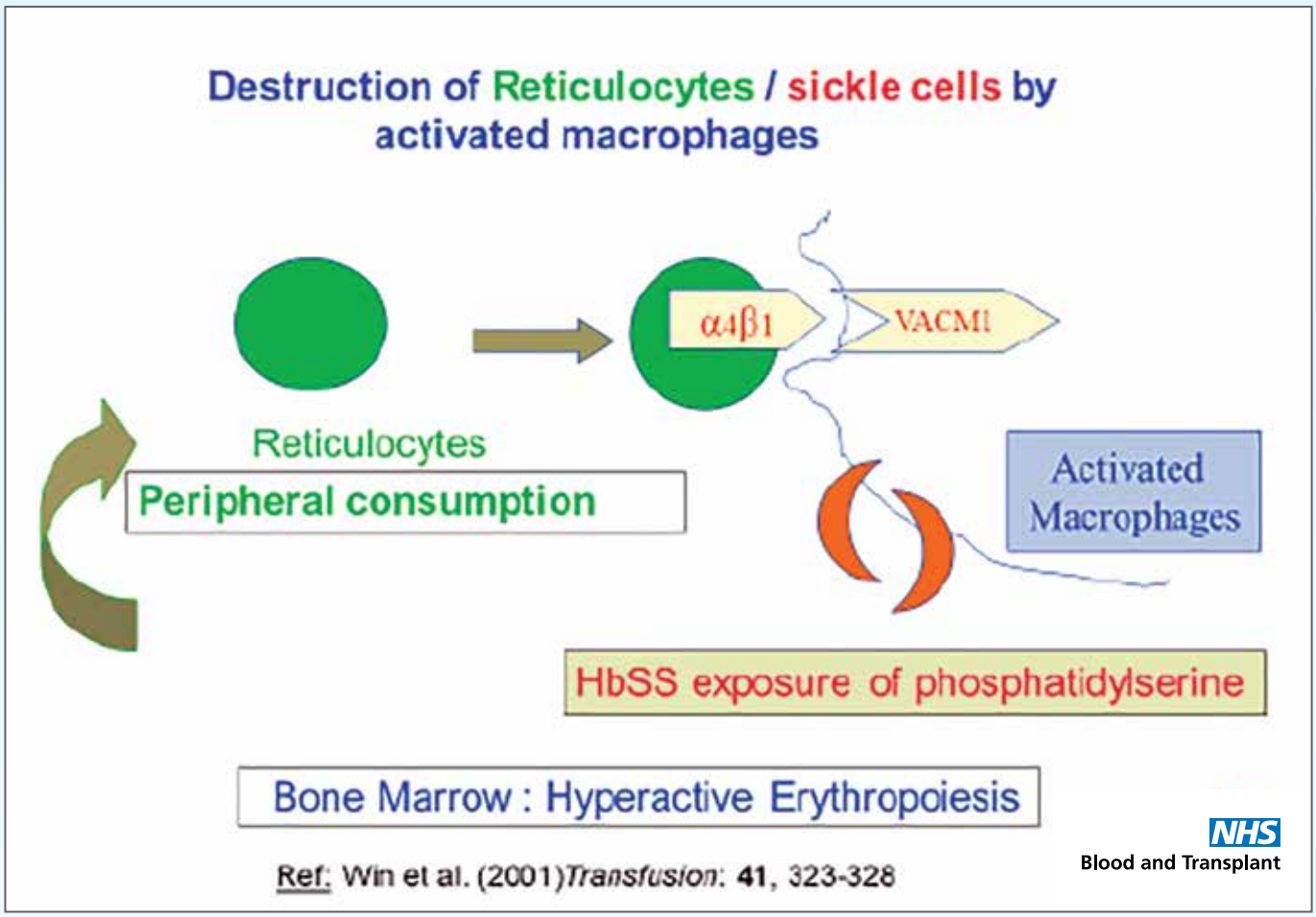
Several possible mechanisms on suppression on macrophage activity has been proposed and have also been suggested that IVIG may prevent adhesion interactions between sickle erythrocytes, reticulocytes and macrophages.[12] Steroids are also prescribed in conjunction with IVIG in hyperhaemolysis. Optimal steroid dose is not well established (IV methylprednisolone 0.5g/day to 1g/day (adults) and 4 mg/kg (paediatric patients) for 2 days. **Steroids and IVIG may have a synergistic effect in suppressing macrophages**.[12]

6. What are the pathogenesis of PTHS

Although the first case of PTHS was reported in 1993 in a SCD patient[2] the pathogenesis still appears to be a subject of debate.[8] Various non-exclusive hypotheses have been proposed, including: marrow suppression,[1] bystander mechanisms[1,8,9] and macrophage activation.[10,11]

In acute form of PTHS there is no evidence of antibody mediated HTR (ie. DAT negative, no alloantibodies detected).

Figures explain the adhesion mechanisms: "Hb SS adhere to macrophage more readily than HbA RBC through aminophosphatides (phosphotidylserine) express on the outer membrane of sickled RBC. Activated macrophages express vascular cell adhesion molecule (VCAM-1) which interacts with α4β1 integrin. α4β1 integrin is expressed in reticulocytes in SCD. Interaction between the intercellular adhesion molecule (ICAM-4): a glycoprotein which express both on mature BRC and reticulocytes, and the integrin CD11c-CD18, which is also over expressed in activated macrophages, may trigger red cell destruction. Via this adhesion mechanism patient's own autologous RBC, transfused RBC and reticulocytes are destroyed in both SCD and non SCD patients."[10,11] (see figures). Macrophage activation theory was further supported by monitoring Ferritin. Ferritin is a non-specific biomarker for macrophage activity. Serial measurements of ferritin revealed a significant rise from baseline during haemolysis and decrease with recovery.[12] Same findings were also confirmed in a CLL patient presented with PTHS.[13]


Destruction of Reticulocytes / sickle cells by activated macrophages
α4β1
VACM1
Reticulocytes
Peripheral consumption
Activated Macrophages
HbSS exposure of phosphatidylserine
Bone Marrow : Hyperactive Erythropoiesis
Ref: Win et al. (2001)Transfusion: 41, 323-328
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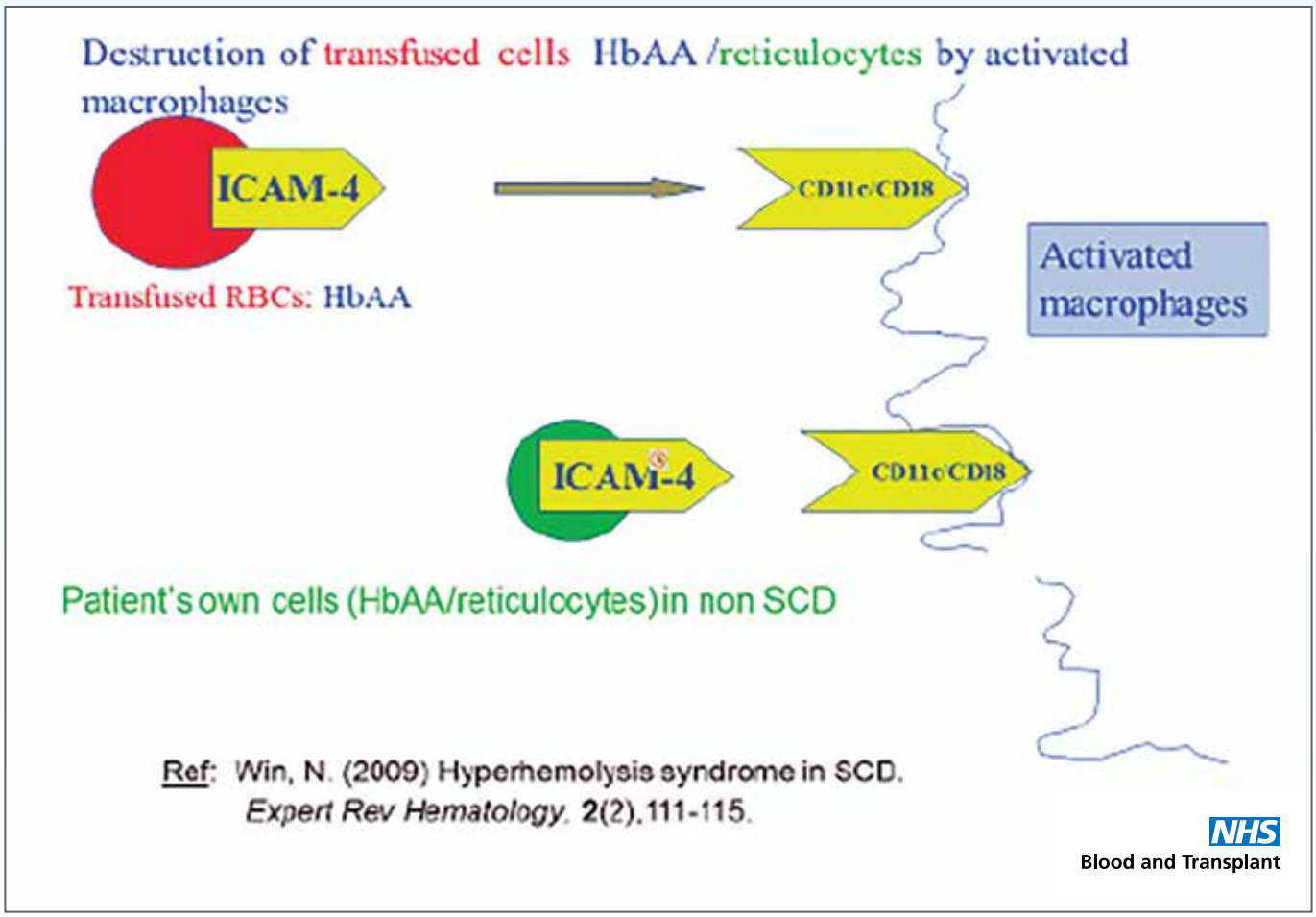
Blood and Transplant


Destruction of transfused cells HbAA /reticulocytes by activated macrophages
ICAM-4
Transfused RBCs: HbAA
CD11c/CD18
Activated macrophages
ICAM-4
CD11c/CD18
Patient's own cells (HbAA/reticulocytes) in non SCD
Ref: Win, N. (2009) Hyperhemolysis syndrome in SCD.
Expert Rev Hematology. 2(2).111-115.
NHS
Blood and Transplant

Question 2

1. What is the diagnosis?

Acute form (DAT negative and no alloantibodies identified) of **resistant PTHS** not responding to **standard** IVIG/steroids **therapy**.

Further study demonstrated very high Ferritin, suggestive of Macrophage activation.

2. How would you further manage this case?

For patient with resistant PTHS, with severe acute haemolysis the patient will need top up transfusion to correct anaemia but will need some immunomodulation.

Following additional therapies have been tried for resistant PTHS.

- Another dose of IVIG/steroids.[10]
- Splenectomy Delmonte *et al*[15,16] (patient with splenomegaly responded to splenectomy).
- Rituximab.[17,18,19]
- Eculizumab.[20,21]
- Plasma exchange has been tried as a life saving measure for recurrent resistant case (only one case report in patient with underlying SCD).[22]

3. What is the role of Rituximab and Therapeutic Efficacy in PTHS?

A small observational study on alloimunised SCD patients with a history of severe DHTR has suggested that Rituximab may potentially minimise the potential risk of further immunisation but does not prevent haemolysis in all patients.[17,18,19] Rituximab causes depletion of B lymphocytes and there is a potential increased risk of infection and it has been suggested that the informed consent should be obtained from the patient before Rituximab is prescribed.[16]

4. What is the role of Eculizumab[20,21] and Therapeutic Efficacy in PTHS?

This is a severe form of resistant of acute PTHS evidence by DAT negative, no antibodies detected, not responding to standard IVIG/steroid therapy as Ferritin is high Macrophage specific therapy might be beneficial in this case.

A physician from USA looking after the SCD patient with severe resistant acute PTHS case with nadir Hb dropped to 22g/L contacted an NHS Blood and Transplant Consultant regarding further management of that case. Requested to check Ferritin (base line 157 ng/mL raised to 16300). Use of anti-macrophage specific therapy Tocilizumab was discussed. As this is a novel therapy it was agreed that they should explain to the patient/family member the rationale behind why we want to try this new therapy and seek consent from them.

Fortunately, the drug was readily available and Tocilizumab was prescribed with good outcome, patient survived. Submitted to ASH by LL "Targeting Macrophage Activation in Hyperhemolysis Syndrome with Novel Use of Tocilizumab" accepted and is the process of writing up the case. Further transfusion was given with Tocilizumab cover and Ferritin level decline with therapy.

Patient with severe PTHS may die of severe haemolysis.[24] There are three case reports in SHOT.[23]

The case from USA was presented at the Royal London SCD team and they are planning to prescribe Tocilizumab for rare severe resistance PTHS cases. These are rare and may occur about one or two cases per year.

If any of you come across severe life threatening resistant cases, please let me know or in my absence please contact Fred Chen on 07957 441933 or 0203 246 0338/9 – Royal London PA. (Frederick.chen@nhs.net).

It is important that the Ferritin should be measured and the case should fulfil the criteria for acute PTHS as described.

Gupta *et al* have tried Ecluzimab in PTHS and reported unresponsive to therapy.[20] Dumas *et al* have tried Eculizumab as salvage therapy in patients with SCD and authors have concluded that further assessments are required in prospective studies, taking into account the cost and possible side effects of this therapy.[21]

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6. A	7. B	8. B	9. A	10. D

Diary Dates

2019

DATE 6 – 8 March
The London Haematopathology Course
Location: Cellular Pathology Department, The London Hospital, Whitechapel, London.
For more information contact:
www.b-s-h.org

DATE 11 - 15 March
Manchester Blood Coagulation Course
Location: The Hallmark Hotel Manchester South, Manchester M14 6AF
For more information contact:
www.b-s-h.org

DATE 31 March
BSH Making Sense of Haematology
Location: SEC Centre Glasgow,
For more information contact:
www.b-s-h.org

DATE 1 - 3 April
British Society for Haematology 59th Annual Scientific Meeting
Location: SEC Centre Glasgow.
For more information contact:
www.b-s-h.org

DATE 8 May
UK Forum for Haemoglobin Disorders 48th Academic Meeting
Location: Cavendish Conference Centre, London.
For more information contact:
www.b-s-h.org

DATE 14 June
World Blood Day
For more information contact:
www.awarenessdays.com

DATE 1 – 3 April
British Society for Haematology 59th Annual Scientific Meeting
Location: SEC Centre Glasgow.
For more information contact:
www.b-s-h.org

DATE 19 June
The 26th International Congress on Thrombosis
Location: Megaron Athens International Conference Centre, Athens, Greece.

DATE 21 June
Targeted Treatments for Haematological Cancers
Location: The Royal Marsden Educations Conference Centre, Stewarts Grove, London.
For more information contact:
www.b-s-h.org

DATE 7 July
Annual SHOT Symposium
Location: Rothamsted Centre for Research and Enterprise, Harpenden, Hertfordshire.
For more information contact:
www.b-s-h.org

DATE 8 July
An Introduction to Immunology
Location: University of Warwick – School of Life Sciences, Warwick
For more information contact:
www.b-s-h.org

DATE 17– 20 September
16th International Congress on Antiphospholipid Antibodies
Location: Manchester Central, Manchester
For more information contact:
www.b-s-h.org

DATE 18 – 20 September
BBTS Annual Conference
Location: Harrogate
For more information contact:
www.bbts.org.uk

DATE 19 – 22 October
AABB Annual Meeting
Location: San Antonio, TX
For more information contact:
www.aabb.org

Notes

Notes

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Oak House, Reeds Crescent, Watford, Herts WD24 4QN
(Telephone 0114 358 4804)

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