

National Blood Transfusion Committee and NHS Blood and Transplant

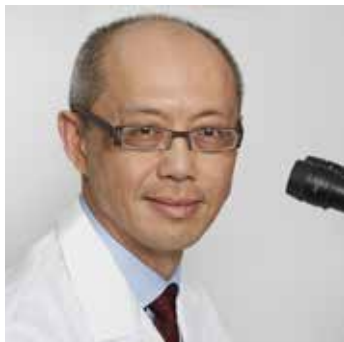


Transfusion 2024

A Five-year Plan for Clinical and Laboratory Transfusion



FOREWORD



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Acknowledgements:

A summary of stakeholders involved in Transfusion 2024 are detailed at the end of the report.

The support of the following is specifically acknowledged:

Dr Jon Cort, Deputy Chair,
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Dr Shubha Allard, Secretary,
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Transfusion 2024 is a call to action and provides a plan for us all to push boundaries and achieve the best possible transfusion care for all patients. Transfusion 2024 also marks a defining moment for how the National Blood Transfusion Committee and NHS Blood and Transplant worked together in an inclusive manner. We listened to the diverse views, expertise and experience of our stakeholders, and we are fully committed to continue in this way to deliver Transfusion 2024.

We are both excited about its ambition to improve safety, experience and outcomes for our patients. This lies at the very heart of modern medicine and we are determined that Transfusion 2024 sets an exemplar of how clinical, laboratory, scientific and technological advances can be embraced efficiently and translated effectively. Its delivery will challenge us all, but we are confident of success because the transfusion community has shown itself to be resilient and adaptable, especially during COVID-19.

We are proud to be part of the transfusion community in these uncertain and frightening times; where innovation and resilience has supported donors, healthcare workers and patients to consolidate the NHS as an exemplary healthcare system that we all can be proud of.

Our confidence also stems from the rich history of pioneering transfusion medicine in the UK, which has provided such solid foundations to further build upon.

We have several asks of you. Firstly, to engage and embed these recommendations. Secondly, to be the champions and ambassadors of Transfusion 2024. Do share this with the leaders of your service and organisation. Do help them recognise how they too are included in supporting this important work for patients. Last but not least, we want to learn from you – about what works and what could be done better – so that together, a whole system approach is truly delivered to level up transfusion medicine.

Transfusion 2024 could not have taken shape without the dedication and efforts of many. We are indebted to them and look forward to their continued drive towards its successful delivery. We are both privileged to be leading on this and take pride in recommending Transfusion 2024 to you.

With our best and warmest wishes always.

EXECUTIVE SUMMARY

- The best practice guidance contained within this publication will facilitate the necessary change in pathway design to meet the transfusion challenges and pressures for the restoration of a cohesive, and functional, healthcare system following the COVID-19 pandemic.
- The Transfusion 2024 plan outlines key priorities for clinical and laboratory transfusion practice for safe patient care across the NHS for the next 5 years. It is based on the outcomes of a multi-professional symposium held in March 2019, organised by the National Blood Transfusion Committee (NBTC) and NHS Blood and Transplant (NHSBT), attended and supported by Professor Keith Willet and Dame Sue Hill on behalf of NHS England and Improvement.
- Around 2 million units of blood and components are transfused in hospitals across England each year. They support the care of adult and paediatric patients across a wide spectrum of clinical disciplines such as trauma, surgery, cancer, renal, haemoglobinopathy, and intensive care. It is essential to define a clear policy for the multiple healthcare teams involved to support safe and appropriate use of blood for effective patient care.
- The symposium highlighted the importance of building on the successes of previous Better Blood Transfusion Health Service Circulars.^{1a, b & c} This led onto Patient Blood Management initiatives² with the NBTC and NHSBT working collaboratively with hospital teams, Royal Colleges, professional bodies, regulators, healthcare providers and patients to help determine priorities for transfusion care in line with key NHS strategic direction.
- Over the last ten years there has been considerable improvement in transfusion practice supported by evidence from clinical trials, implementation of guidelines and process improvements that have resulted in an overall reduction in blood use and significant cost savings for the NHS. However, there is evidence of ongoing variability in transfusion practice within and between hospitals that may impact on patient outcomes needing further action.
- There are over 200 hospital transfusion laboratories within Trusts across England with major challenges and concerns around the current delivery of service to support safe transfusion for patients. It is essential to define key actions with emphasis on an educated and trained workforce, with appropriate IT support working in integrated partnerships with specialist NHSBT laboratories and across pathology networks within the principles of current NHS strategy. The COVID-19 pandemic has acutely highlighted the need for greater partnership and closer working between NHSBT and hospital laboratories, underpinned by rapid good quality data exchange.
- There are many opportunities for innovation in processes, technology and blood components that will improve services to hospitals and benefit patients. Some key areas identified by user groups for continued research and translation into practice include the use of big data, new component development and donor genotyping.
- The recommendations for further action are in line with the NHS Long Term Plan³ with emphasis on a skilled and trained workforce, better use of data and technology, integrated models of working and promoting inter-operable digital solutions as highlighted by the Department of Health and Social Care while promoting a safer culture in accordance with the NHS Patient Safety Strategy⁴.

SUMMARY OF RECOMMENDED ACTIONS AND KEY MEASURES

There is a history of strong partnership between the NBTC and NHSBT in developing national guidance. This has successfully influenced best practice with significant benefits to patient care. There are further priorities that need action within the new NHS operating model following the onset of the COVID-19 pandemic.

This strategy builds on recommendations of previous Better Blood Transfusion Health Service Circulars relating to the safe and appropriate use of blood^{1a,b,c, 2} with many of the actions outlined below being implemented within the regulatory, training, and operational infrastructure already developed including Hospital Transfusion Committees and allied teams. We recommend ongoing NHSBT support for clinical transfusion and PBM initiatives across the NHS.

The key actions together with measures for determining progress and target groups responsible are summarised in four key areas as follows:

A: Patient Blood Management

	Action	Deliverable	Key Responsibility. Other stakeholders
1.	<p>Self-Assessment</p> <p>Develop a transfusion practice self-assessment tool for hospitals to allow benchmarking as an initial step towards external accreditation.</p>	<p>Develop a tool for self-assessment by hospitals/trusts with plan for pilot and rollout.</p> <p>To include compliance with NICE Quality Standards for Transfusion.</p> <p>To promote best practice in quantitative and qualitative terms across the healthcare system e.g. triangulation of the 'Model Hospital' and 'Getting it Right First Time' (GIRFT) datasets to transfusion performance metrics to improve the visibility of transfusion within the monitoring and quality framework across the NHS.</p>	<p><u>NBTC</u> Trusts</p> <p><u>NHSEI</u> Trusts</p>
2.	<p>Resources to support clinical transfusion practice</p> <p>a) Strengthen support within hospitals and NHSBT for clinical transfusion practice.</p> <p>b) Develop and implement a national competency framework for transfusion practitioners.</p>	<p>Define minimum recommended levels of transfusion practitioner staffing and other resources for Hospital Transfusion Teams.</p> <p>NHSBT to review and strengthen support for clinical transfusion practice (including PBM teams, the National Comparative Audit programme and Blood Stocks Management Scheme).</p> <p>Develop a documented competency framework for transfusion practitioners with plan for pilot and implementation.</p>	<p><u>NBTC</u> Trusts</p> <p><u>NHSBT</u></p> <p><u>NBTC</u> HEE</p>
3.	<p>Inclusion of transfusion in national patient quality and safety initiatives</p> <p>Aim to include where feasible transfusion data in national databases of diseases/outcomes for which transfusion is regularly used.</p>	<p>Review feasibility for inclusion of transfusion data in databases including major surgery, cardiac surgery and major joint replacement.</p>	<p><u>NHSEI</u> Royal Colleges</p>

B: Transfusion Laboratory Safety

	Action	Deliverable	Key Responsibility Other stakeholders
1.	<p>Scientific and technical education and training</p> <p>Review scientist training pathways and programmes to strengthen transfusion content and review mode of delivery.</p> <p>Review and strengthen NHSBT provision of scientific and technical training including access and funding mechanisms.</p> <p>Provision of training resources for all laboratory staff to ensure an appropriately skilled and knowledgeable workforce.</p>	<p>Produce a review of transfusion scientist training.</p> <p>Participate in NHSEI Healthcare Science Workforce Partnership Board.</p> <p>Agree funding with NCG/HEE with support of NBTC.</p> <p>Discuss and agree with affiliated bodies.</p>	<p><u>NHCS</u> NBTC IBMS; BBTS HEE</p> <p><u>NHSBT</u> NCG HEE</p>
2.	<p>Laboratory staffing</p> <p>Ensure adequate staffing and skill mix to cover the laboratory workload and complexity at all times, to maintain the Quality Management System effectively and to meet regulatory requirements.</p>	<p>Laboratories to have robust capacity planning to ensure adequate staffing, skill mix and resources for safe and effective delivery of services. Capacity plans must be fully supported by trust senior management.</p> <p>Ensure the safe use of non-haematology staff especially in essential laboratory services (ESLs) out of hours, supported by guidance on education requirements for multi-disciplinary staff.</p>	<p><u>NHSEI and Trusts</u> NBTC NHSE&I Regional Offices and Trusts</p>
3.	<p>Integrated services</p> <p>Undertake pilots of integrated transfusion services between NHSBT RCI and hospital transfusion laboratories including development of the Consultant Clinical Scientist role.</p>	<p>Completion of two pilots (RCI assist) with reporting to the NBTC and NCG with recommendations for further work.</p> <p>Develop and implement a strategy for Consultant Clinical Scientists to take a leadership role in transfusion.</p>	<p><u>NHSBT</u> NCG Trusts NSHCS (HSST) RCPATH</p>
4.	<p>Pathology networks</p> <p>NHSEI Specialist Transfusion Advisory Committee to promote implementation of regional transfusion networks with defined standards.</p>	<p>Development of defined standards for laboratory transfusion practice as part of networks with pilot of assessment.</p> <p>Inclusion and review of blood usage/wastage data across networks to optimise appropriate use and stockholding e.g. of group O D negative red cells.</p>	<p><u>NHSEI</u> NBTC NHSBT Trusts</p>
5.	<p>Regulatory/Compliance alignment</p> <p>MHRA & UKAS to support collaborative working and reduce the compliance burden for transfusion laboratories.</p>	<p>Work towards a unified standard.</p>	<p><u>UKAS & MHRA</u> NHSEI NBTC</p>
6.	<p>Adverse event reporting</p> <p>Promote a just culture.</p> <p>Ensuring continuity of professional independence for SHOT.</p> <p>Facilitate and support collaboration between SHOT and MHRA.</p>	<p>Promote a culture where all staff involved with transfusion are supported in highlighting and reporting adverse events.</p> <p>Ensure continuity of professional independence for SHOT.</p> <p>Support collaboration between SHOT and MHRA to improve reporting with reduced duplication of effort.</p>	<p><u>NHSEI Hospitals</u></p> <p><u>UK Blood Services</u></p>

C: Information Technology

	Action	Deliverable	Key Responsibility Other stakeholders
1.	<p>Transfusion IT</p> <p>Develop a blueprint for hospitals and IT suppliers to jointly improve safety and efficiency of transfusion laboratory IT. This should include:</p> <p>Enhancing IT connectivity between hospitals and NHSBT and promoting interoperability in line with the Wachter review⁵ and NHSX strategy⁶.</p> <p>Collection of data to monitor clinical and laboratory transfusion practice and facilitate benchmarking.</p>	<p>Inclusion of defined standards for hospital transfusion IT within pathology networks.</p> <p>Design a blueprint for managing inventory and define an approach for roll out to hospitals.</p> <p>Pilot electronic requests for NHSBT reference laboratory tests and electronic provision of results from NHSBT to trusts.</p> <p>Develop standards for routine collection of data on blood utilisation and feedback to clinical teams.</p> <p>Note: implementation will be subject to agreement on the solution and funding.</p>	<p><u>NHSEI</u> Trusts, NHSBT IT suppliers</p> <p><u>NHSBT</u></p> <p><u>NBTC</u> BSH Guidelines</p>
2.	<p>Vein to vein electronic tracking</p> <p>Develop a plan to drive the implementation of vein to vein electronic systems from donation, recipient group and screen sample, blood collection, administration of blood and monitoring of transfused patients.</p>	<p>Develop and implement a strategy for the rollout of electronic tracking in hospitals.</p> <p>Note: implementation will be subject to agreement on the solution and funding.</p>	<p><u>NBTC</u> Trusts</p>

D: Recommendations for further Research and Development

	Action	Deliverable	Key Responsibility Other stakeholders
1.	<p>Data Driven Transfusion Practice</p> <p>Determine feasibility of applying big data and machine learning to obtain real time data on the whole transfusion process from donor to patient.</p>	Seek funding to support collection and analysis of large datasets on how blood and components are being used to facilitate benchmarking of NHS hospitals and predictions of blood component demand.	<u>NHSBT</u> Trusts
2.	<p>Component development</p> <p>Continue support for component development aligned to patient needs.</p>	Work with Regional Transfusion Committee (RTC) chairs to identify new components to develop for clinical trials. Agree pathway for component development over the next 5 years. Ongoing close partnership between hospitals and NHSBT towards completion of UK trials on COVID-19 convalescent plasma with translation of findings to patient care.	<u>NHSBT</u> NBTC
3.	<p>Donor and patient typing</p> <p>Model optimal donor and patient typing and implement the most cost-effective systems, including genotyping, to meet the needs of chronically transfused patients and those difficult to provide with compatible blood.</p>	Define and develop a pilot of genotypically matched blood for multitransfused patients. To include a health economic analysis of clinical benefit.	<u>NHSBT</u> Trusts
4.	<p>Transfusion Research</p> <p>Relevant bodies to continue funding and providing advocacy for clinical transfusion research.</p>	Perform an options appraisal on the benefits of establishing a clinical trials network in transfusion, with the aim of speeding up the delivery of clinical trials of blood components and improving patient outcomes.	<u>NHSBT</u> Royal Colleges Trusts

A: From Better Blood Transfusion to Patient Blood Management

There is a need to build on previous successes of the initial Better Blood Transfusion^{1a, b, c} and subsequent Patient Blood Management initiatives². There is also a need to adapt services following the COVID-19 pandemic that has further highlighted the need for closer working relationships between hospitals and NHSBT.

Better Blood Transfusion (BBT): The UK Chief Medical Officers convened seminars in 1998, 2002, and 2007 resulting in three 'Better Blood Transfusion' (BBT) Health Service Circulars.^{1a, b, c} These provided specific recommendations to improve blood transfusion practice with action plans for hospitals and the blood service in England. The development of Hospital Transfusion Committees and Hospital Transfusion Teams incorporating clinicians, laboratory staff and transfusion practitioners (TPs) and the establishment of the National Blood Transfusion and Regional Transfusion Committees in England have driven major improvements in transfusion practice.

Patient Blood Management: The work of the BBT initiatives continued under the term of Patient Blood Management (PBM), an internationally recognised initiative, defined as 'an evidence-based, multidisciplinary approach aimed at optimising the care of patients who might need transfusion'. A recent International Consensus Conference has highlighted key areas with good evidence for transfusion practice.⁷ PBM should be adopted as a quality initiative needing clear leadership within hospitals to drive change. The publication of NICE Transfusion Guidelines NG24 in 2015⁸ and national PBM guidelines in 2014² has increased uptake, but more work is required to ensure they are fully implemented. Improved monitoring of transfusion practice at hospital level in line with national guidance based on clinical transfusion/PBM standards may help drive further improvements.

Achievements to date: Demand for red cells rose steadily during the 1990s reaching a peak of 2.25 million units in the year 2000. There are groups of patients who have been identified as requiring increased transfusion support during this time, for example those with sickle cell disease.⁹ The successful implementation of BBT and PBM initiatives to support the safe and appropriate use of blood components has however resulted in a progressive reduction in overall demand to 1.5 million in 2018 (equivalent to a saving of £100 million per year for the NHS). There are many factors that have helped facilitate this change, but providing evidence through clinical research, development of guidelines, and translation of these guidelines into practice by education and audit, have been significant drivers. The development of Hospital Transfusion Teams with TPs as key members (as recommended by the second BBT initiative^{1b}) has been recognised as an essential driver for improvement in clinical transfusion practice.

Transfusion practitioners, hospital transfusion teams and

healthcare professionals involved in transfusion: National PBM surveys

(2015 & 2018) highlighted a wide variation in hospital transfusion team structures between organisations with varying TP numbers and levels of team support (for full results see the link in reference¹⁰). TPs are key to PBM but an improved structure and career pathway, and a nationally agreed competency framework are required.

NHSBT support for PBM: The NHSBT PBM multi-disciplinary teams have provided additional support to the NBTC framework, and directly to hospital teams in key areas including education and patient information. The National Comparative Audit Programme (NCA), funded by NHSBT, provides essential data highlighting that approximately 25% of blood and components are still used inappropriately¹¹ and SHOT continues to document weaknesses in transfusion safety in hospitals that need to be addressed.¹²

Leadership and support from NHS England and Improvement (NHSEI) and across

organisations: The importance of transfusion and its contribution to patient care and safety needs to be recognised by NHS trusts' senior management. Transfusion data should be included in routine quality monitoring by trusts and, where feasible, be included in relevant clinical specialty audits and databases. The COVID-19 pandemic highlighted the need for more robust systems for real time transfusion data to support stockholding and planning by hospitals, and the blood service for optimum care to patients.

Actions:

1. **Develop a transfusion practice self-assessment tool for hospitals to allow benchmarking as an initial step towards possible external accreditation. NBTC**
2. **Resources to support clinical transfusion practice:**
 - a. **Strengthen support within hospitals and NHSBT for clinical transfusion practice. NHSBT/Trusts**
 - b. **Develop and implement a national competency framework for transfusion practitioners. NBTC/NHSBT**
3. **Include transfusion in national key patient quality and safety initiatives: national databases of diseases/outcomes for which transfusion is regularly used should include transfusion data in data collection templates where feasible. Royal Colleges/ NHSEI**

B: Hospital Transfusion Laboratories

The UK Transfusion Laboratory Collaborative (UK TLC) has highlighted that the regulatory burden, erosion of staffing levels and lack of appropriately trained scientists, together with increasing out of hours' workload, as part of the '24/7 NHS', are factors contributing to serious concerns about the viability and safety of hospital transfusion laboratories. Accordingly, there is an urgent need to strengthen support for hospital transfusion laboratories to ensure safe provision of care for the many patients in need of transfusion.¹³ The COVID-19 pandemic has further exposed pressures on scientific and technical staff with a need for urgent action.

Education and Training: Current scientific training and education does not equip scientists to work in a hospital transfusion laboratory without significant additional laboratory training, leading to wide variation in practice. Education for transfusion scientists can follow different pathways. The Scientist Training Programme (STP) and Higher Specialist Scientific Training (HSST) currently requires registration as a clinical scientist, which can be a protracted route for biomedical scientists. It is clear that these pathways need review. Courses currently offered by NHSBT and funded by Health Education England (HEE) are a valuable training resource and need expansion with equitable provision. There is also a need for adequate resources to enable continuing professional development for all staff without the need for them to attend external courses.

Hospital and NHSBT Integration pilots: NHSBT's Red Cell Immunohaematology (RCI) services support hospital transfusion laboratories in dealing with complex transfusion problems. RCI activity has increased by 26% since 2014, with on-call work increasing by 36%. A change in capacity and capability of hospital laboratories has been a key driver for this change. Pilot studies of collaborative models for integrated transfusion services between NHSBT and hospitals are currently underway. However, if successful, there are concerns about the capacity of RCI to implement this model on a larger scale unless further funding is secured from the National Commissioning Group for Blood (NCG).

Pathology Modernisation: NHS Improvement are promoting the development of 29 pathology networks as part of pathology modernisation across the country.¹⁴ There is no exemplar model for transfusion instead the focus is on the core service of blood sciences. As a result, there is inconsistency in the way networks implement the delivery of transfusion services. Clear defined standards are required to support safe delivery of transfusion services within pathology networks. All transfusion laboratories will need robust capacity planning to support safe delivery of services.

Regulation and Reporting: Hospital trusts must be able to demonstrate that the transfusion services they provide are safe and fit for purpose. The public should be able to seek assurance about the services provided. Compliance with the Blood Safety and Quality Regulations (BSQR) is mandated in law with the Medicines and Healthcare Products Regulatory Agency (MHRA) as the competent authority. Compliance with the International Organisation for Standardisation (ISO) standard 15189, as assessed by UKAS, is not mandated but is a pan-pathology requirement, not only for assurance but also for participation in trial work. Dual regulatory activities can detract from core service provision and lead to inefficiency of workload. It is logical and timely to simplify and align such activity to remove duplication.

Adverse event reporting: The Serious Hazards of Transfusion (SHOT) UK haemovigilance scheme has made very significant national and international contributions to transfusion safety over 23 years¹². Reporting transfusion errors relating to the quality and safety of blood and blood components is currently a statutory requirement with MHRA as the competent authority. SHOT and MHRA have been working collaboratively to produce a single reporting portal. It is essential to promote a just culture to ensure staff feel free to report without fear of recrimination or disciplinary action.

Actions:

1. **Scientific and technical education and training:**
 - a. **Review scientist training pathways and programmes to strengthen transfusion content and review mode of delivery of training. [NSHCS/NBTC/IBMS; BBTS/HEE](#)**
 - b. **Review and strengthen NHSBT provision of scientific and technical training including access and funding mechanisms. [NHSBT/HEE](#)**
2. **Ensure adequate staffing and skill mix to cover the laboratory clinical workload and complexity at all times, to maintain the Quality Management System effectively and to meet regulatory requirements. [NHSEI regional offices and Trusts](#)**
3. **Undertake pilots of integrated transfusion services between NHSBT RCI and hospital transfusion laboratories including development of the Consultant Clinical Scientist role. [NHSBT/NCG/Trusts/NSHCS \(HSST\)/RCPath](#)**
4. **NHSEI Specialist Transfusion Advisory Committee to promote implementation of regional transfusion networks with defined standards. [NHSEI/NHSBT/Trusts](#)**
5. **MHRA & UKAS to support collaborative working and reduce the compliance burden for transfusion laboratories. [UKAS/MHRA/NHSEI/NBTC](#)**
6. **Promote a just culture. Ensuring continuity of professional independence for SHOT. Facilitate and support collaboration between SHOT and MHRA. [NHSEI/Trusts/UK Blood Services](#)**

C: Information Technology

Many of the above recommendations require good data collection and data interchange. The need for responsive good quality data on blood use and stockholding in hospitals to support NHSBT demand and supply planning was very evident during the COVID 19 pandemic. This requires robust IT systems to support transfusion safety and patient care.

Transfusion errors: Over the last 15 years, there has been considerable progress in reducing errors that might result in wrong transfusion events and in decreasing inappropriate transfusion. However, SHOT continues to document instances of major errors including ABO incompatible red cell transfusions (a 'never event'), and data from the National Comparative Audit of Blood Transfusion programme indicates there continues to be considerable overuse of blood. These problems with transfusion practice persist despite considerable efforts in staff training and other measures, such as recommendations to use check lists for routine transfusion procedures.

Electronic systems and transfusion safety and efficiency: There is increasing evidence that the implementation of electronic systems for blood sample collection and labelling, the collection of blood from its storage sites, and its administration has improved patient care by reducing wrong transfusion events. Multicentre UK data¹⁵ collected by SHOT¹² together with an international study have demonstrated improvements in the safety and efficiency of transfusion from the use of electronic processes, for example the use of electronic remote blood issue for improving the speed of blood delivery for urgent transfusions.¹⁶ An International Consensus Conference on PBM⁵ reported evidence that computerised or electronic decision support systems improve appropriate RBC utilisation. Despite this evidence for the effectiveness of IT, NHS Trusts have been slow to implement new technology to support clinical transfusion practice. Investment has also been lacking for upgrading transfusion laboratory systems, not only so they are 'fit for purpose' to minimise the risk of error, but also in terms of their connectivity with other IT systems within trusts and with NHSBT to support the efficiency of transfusion services. The Healthcare Safety Investigation Branch (HSIB), funded by the Department of Health and Social Care, undertook an investigation of wrong blood in tube (WBIT) events in 2019¹⁷ and recommended that NHSX should take steps to ensure the adoption and ongoing use of electronic systems for identification, blood sample collection and labelling. Recognition that existing electronic patient record systems may not meet these requirements is essential. NHSX is a new team driving digital transformation of healthcare; it incorporates teams from DHSC, NHS Digital and NHS England and Improvement⁶.

Implementation: It is recognised that for large, complex and multi-disciplinary systems, transfusion is often a small part of the implementation and unique, key issues within the transfusion field are often not appreciated. Implementation is often delayed due to complexity of the system and this impact needs to be minimised. If undue delays are happening, consideration should be given to transfusion being a bespoke system.

Actions:

1. **Develop a blueprint for hospitals and IT suppliers to jointly improve safety and efficiency of transfusion laboratory IT. This should include:**
 - a. **Enhanced IT connectivity between hospitals and NHSBT and promote interoperability in line with the Wachter review⁵ and NHSX strategy⁶ [NHSEI/Trusts/NHSBT/IT suppliers](#)**
 - b. **Collection of data to monitor clinical and laboratory transfusion practice and facilitate benchmarking. [NBTC/BSH Guidelines](#)**
2. **Develop a plan to drive the implementation of vein to vein electronic systems from donation, group and screen sample, blood collection, administration of blood and the monitoring of transfused patients. [NHSEI/Trusts/IT suppliers](#)**

These two actions could be linked and will require funding and co-ordination on a network, regional and/or national basis.

D: Recommendations for further Research and Development

The evidence base for transfusion has greatly increased but ongoing focus is required with emphasis on innovation in processes, technology and blood components with translation to patient care.

Big Data and Machine Learning: The use of 'big data' and 'machine learning' in transfusion should be developed to support research into key characteristics of donors and blood components that impact on patient outcomes. This would include the degree of blood group and other antigen matching required between donors and patients; for example, patients requiring chronic transfusion support. The collection and analysis of large datasets will also allow a greater understanding of clinical use of blood, and facilitate benchmarking of hospitals using transfusion standardised denominator data, such as hospital bed days and patient co-morbidities. The use of real-time blood use data will enhance predictions of blood component demand. The need for such data was evident to support planning during the COVID-19 pandemic and concerns around assurance of the blood supply to meet patient demand. There are barriers to the use of large-scale patient and donor data, including concerns about data security, lack of data standardisation, and fragmented, poorly integrated electronic health systems in the NHS.

Component development: More universal, and better quality components will improve patient care, simplify supply chains and reduce workload in hospital transfusion laboratories. Current research into new blood components includes development of universal plasma, whole blood components for trauma and longer cryoprecipitate viability post thaw. Planned research includes simplifying the platelet inventory by providing platelets that do not require RhD typing and looking at the feasibility of using dried plasma and cryoprecipitate. The need to rapidly develop high quality trials for component development, to support patient care, was evident during the COVID-19 pandemic with two large trials of convalescent plasma developed at considerable speed requiring close collaboration between hospitals and NHSBT. Future research must ensure that the potential introduction of new components has a robust health economic assessment to ensure that they are cost-effective for the NHS as a whole.

Patient and donor typing: Alloimmunisation occurs in approximately 5% of all transfused patients with much higher rates of around 30% or more in patients with sickle cell disease contributing to a disproportionate amount of all the diagnostic and clinical work in hospitals and specialist referral departments at NHSBT. Providing extensively matched blood for patients on long term transfusion programmes and those with antibodies, puts additional pressure on the supply of 'universal' O D negative red cells, often substituted for the patient's own blood group to supply a matched component. Optimising donor typing can help alleviate this whilst facilitating improved supply of phenotype matched blood to those requiring long-term transfusions, in particular for patients with complex antibodies or rare blood types. This type of research also requires robust health economic assessment to ensure changes in matching of blood components are cost-effective for the NHS as a whole.

Transfusion research: Good transfusion practice improves patient outcomes and enables cost savings within hospitals. Important clinical studies such as the Transfusion Requirements in Critical Care (TRICC) trial, the Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair (FOCUS) study, Transfusion Requirements in Paediatric Intensive Care Unit (TRIPICU), Trial of Prophylactic Platelets (TOPPS), and Platelets for Neonatal Transfusion – Study 2 (PlaNeT-2) have demonstrated the safety and value of restrictive transfusion regimes. Conversely studies in red cell provision for sickle cell disease and haemostatic blood component support in trauma have demonstrated the value of more bespoke patient targeted transfusion regimes in these settings. When primary research has been performed but the trials are underpowered, the importance of systematic reviews to integrate the evidence cannot be underestimated. These can inform transfusion guidelines and can improve patient care. Further research is required in areas where the evidence base is unclear and to further understand the indications for transfusion and impact on patient outcomes.

Actions:

- 1. Determine feasibility of applying big data and machine learning to obtain real time data on the whole transfusion process from donor to patient. NHSBT/Trusts**
- 2. Continue support for component development aligned to patient needs. NHSBT**
- 3. Model optimal donor typing and implement the most cost-effective systems for the NHS, including genotyping based on the needs of chronically transfused patients and those difficult to provide with compatible blood. NHSBT/Trusts**
- 4. Relevant bodies to continue support for clinical transfusion research. NHSBT/Royal Colleges/Trusts**

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Glossary

CSO	Chief Scientific Officer
CQC	Care Quality Commission
HEE	Health Education England
HSST	Higher Specialist Scientific Training
NBTC	National Blood Transfusion Committee
NCG	National Commissioning Group (for Blood)
NHSBT	NHS Blood and Transplant
NHSEI	NHS England and Improvement
NSHCS	National School of Healthcare Science
MHRA	Medicines and Healthcare Products Regulatory Agency
RCI	Red Cell Immunohaematology
SHOT	Serious Hazards of Transfusion UK haemovigilance scheme
UKAS	UK Accreditation Service

Transfusion 2024 Symposium March 2019

Program with speaker and chair biographies at the Transfusion 2024 Symposium in March 2019 at: www.transfusionguidelines.org/uk-transfusion-committees/national-blood-transfusion-committee/transfusion-2024

Professor Keith Willet gave the opening keynote speech. Dame Sue Hill chaired the session on transfusion laboratory safety.

Participants and health care representatives at the Transfusion 2024 Symposium

NHS England and Improvement (NHSEI)

NHS Blood and Transplant – Chair, CEO and other representatives of the Executive Team and Board

Regional Transfusion Committees across England

NBTC Laboratory Managers group and Transfusion Practitioner representatives

NBTC Patient Involvement Working Group with patient representatives

NHSBT Patient Blood Management Practitioners and Consultants

Representatives from Royal Colleges and professional organisations as follows:

- British Society for Haematology (BSH)

- British Blood Transfusion Society (BBTS)

- Royal College of Anaesthetists (RCoA)

- Royal College of Emergency Medicine (RCEM)

- Royal College of Nursing (RCN)

- Royal College of Midwives (RCM)

- Royal College of Obstetricians and Gynaecologists (RCOG)

- Royal College of Paediatrics and Child Health (RCPCH)

- Royal College of Pathologists (RCPath)

- Royal College of Physicians (RCP)

- Royal College of Surgeons (RCS)

- Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO)

- Institute of Biomedical Sciences (IBMS)

- Serious Hazards of Transfusion (SHOT) Scheme

- Medicines and Healthcare Products Regulatory Agency (MHRA)

- UK Intensive Care Society

- UK Sickle Cell Society

- UK Thalassaemia Society (UKTS)

Representation from UK devolved countries.

