
Patient Blood Management

An evidence-based approach to patient care

Foreward

On behalf of NHS England, I am delighted to support the National Blood Transfusion Committee's *Patient Blood Management* recommendations.

Blood components are used to save and improve thousands of lives each year. Red blood cell usage in England has decreased by over 20% in the last 14 years, but national and large regional audits consistently show that 15-20% of red blood cell transfusion is not compliant with national guidelines. Recent meta-analyses show that restrictive red blood cell transfusion reduces mortality and morbidity. Everyone involved in blood transfusion needs to take responsibility for ensuring that blood transfusion is used appropriately.

Patient Blood Management is an evidence-based, multidisciplinary approach to optimising the care of patients who might need transfusion. It encompasses measures to avoid transfusion such as anaemia management without transfusion, cell salvage and the use of anti-fibrinolytic drugs to reduce bleeding as well as restrictive transfusion. It ensures that patients receive the optimal treatment, and that avoidable, inappropriate use of blood and blood components is reduced.

Patient Blood Management needs leadership and support at every level, from trust management, health professionals in hospitals, NHS Blood & Transplant and the National and Regional Blood Transfusion Committees. I commend these guidelines to all, and offer our thanks to the many professionals involved in their development.

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Copies of this document are available on:

<http://www.transfusionguidelines.org.uk/uk-transfusion-committees/national-blood-transfusion-committee/patient-blood-management>

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Summary

Patient Blood Management: The Future of Blood Transfusion conference was held on 18 June 2012. The event was jointly hosted by the Department of Health, the National Blood Transfusion Committee (NBTC) and NHS Blood and Transplant (NHSBT) and supported by Professor Sir Bruce Keogh, NHS Medical Director.

The aim of the multi-disciplinary conference was to share views on how blood transfusion practice could be improved to:

- Build on the success of previous *Better Blood Transfusion* initiatives and to further promote appropriate use of blood components.
- Improve the use of routinely collected data to influence transfusion practice.
- Provide practical examples of high quality transfusion practice and measures for the avoidance of transfusion, wherever appropriate.
- Consider the resources needed to deliver better transfusion practice including support from NHSBT.
- Understand the patient perspective on transfusion practice.

This document provides initial recommendations from the National Blood Transfusion Committee about how the NHS should start implementing *Patient Blood Management*, which is a multi-disciplinary, evidence-based approach to optimising the care of patients who might need blood transfusion.

A toolkit to assist NHS Trusts will be developed and posted on the NBTC website:

<http://www.transfusionguidelines.org.uk/transfusion-practice>

Rationale

Patient Blood Management is an evidence-based, multidisciplinary approach to optimising the care of patients who might need transfusion. It puts the patient at the heart of decisions made about blood transfusion to ensure they receive the best treatment and avoidable, inappropriate use of blood and blood components is reduced. It represents an international initiative in best practice for transfusion medicine.

National, regional and local audits in England consistently show inappropriate use of all blood components; 15-20% of red cells and 20-30% of platelets/plasma. Evidence shows that the implementation of *Patient Blood Management* improves patient outcomes by focussing on measures for the avoidance of transfusion and reducing the inappropriate use of blood and therefore can help reduce health-care costs.

Why does Patient Blood Management matter?

Patient benefit

Increases in the use of blood components are projected due to a number of factors such as medical advances and an ageing population. Only 4% of the eligible population give blood, and new donors are always needed to replace regular donors who can no longer donate.

Patient Blood Management improves patient care by reducing inappropriate transfusion and also helps to ensure the availability of blood components for those patients where there are no transfusion alternatives.

Cost to the NHS

Previous *Better Blood Transfusion* initiatives have been very successful, for example by reducing red cell usage by over 20% over the last ten years. Through sharing data on blood usage, providing examples of best practice and overcoming barriers to change, it should be possible to reduce the current high level of inappropriate use of blood components described above. NHS Blood and Transplant recovers the cost of collecting and processing blood from the hospitals that use it so the NHS will save money by using only the blood that patients need.

Who needs to be involved?

Everyone involved in blood transfusion needs to take responsibility for ensuring that blood components are used appropriately for the benefit of patients. *Patient Blood Management* needs leadership and support at every level, including national and regional leaders, hospital management, and health professionals.

2013 Survey of Patient Blood Management

In October 2013 all NHS Trusts in England were sent a form surveying their preparedness for Patient Blood Management (PBM) and their current activities.

146/149 (98%) Trusts sent a response, and a summary of the key findings is provided below:-

- 40% (59/146) of Hospital Transfusion Committees do not include PBM in their remit or mention the development of a PBM working group
- 96% Trusts have a consultant haematologist responsible for transfusion but only 81% provided information about the number of assigned programmed activities for transfusion; 46% of those that did respond indicated their haematologists have no assigned programmed activities for transfusion
- 17% Trusts have < 1 whole time Transfusion Practitioner
- 75% of Transfusion Practitioners spend 30% or less of their time on PBM activities
- Trusts responding to the survey have 36 different types of transfusion laboratory IT; many have poor functionality to support PBM e.g. only 24% of Trusts use electronic order communications for blood ordering and only 69% of blood transfusion laboratory systems record the reason for transfusion to facilitate audit
- Only 43% of Trusts have a process for reporting blood usage to clinical teams
- Only 53% of Trusts undertake local audits of blood use
- Most Trusts offer training to the majority of clinicians, but 19% did not comment on the training of their FY doctors, and 23% did not send data on how they trained their Core or Specialist trainees.
- Fewer than 65% of Trusts provide information about blood transfusion and document consent in the majority of their patients who might need transfusion
- Only 68% of Trusts provide arrangements for the identification and management of anaemia before elective surgery

- Only 25% of Trusts use near patient haemostasis testing
- Only 21% of Trusts have a policy to minimise the volume and frequency of blood samples to minimise iatrogenic anaemia
- 27% of Trusts are not using tranexamic acid for trauma patients, and 30% are not using tranexamic acid for surgical patients
- There is patchy use of intraoperative cell salvage, for example 55% of Trusts use it for orthopaedic surgery
- Only 29% of Trusts have implemented a policy of transfusing one unit of red cells at a time in non-bleeding patients followed by reassessment of further need for transfusion

Recommendations for the implementation of Patient Blood Management (PBM)

A. General considerations

<u>Establishment of PBM programme and raising awareness amongst clinicians and patients</u>
<ul style="list-style-type: none"> All NHS Trusts should establish a multidisciplinary PBM programme through the Hospital Transfusion Committee (HTC) or as a subgroup of the HTC
<ul style="list-style-type: none"> Education of all clinicians involved in the decision to transfuse blood components should be provided to enhance clinician awareness about good patient blood management including avoidance of blood wherever possible
<ul style="list-style-type: none"> Education of patients for whom transfusion may be a treatment option about individualised blood management and blood avoidance should be an integral part of relevant care pathways
<u>Issues in patient testing</u>
<ul style="list-style-type: none"> The volume and frequency of blood samples should be minimised to prevent iatrogenic anaemia
<ul style="list-style-type: none"> Use of near patient haemostasis and haemoglobin (Hb) testing should be undertaken to guide blood component therapy in patients with haemorrhage in conjunction with the Trust Point of Care Testing (POCT) committee/Pathology laboratory
<u>Use of appropriate dose and thresholds for transfusion</u>
<ul style="list-style-type: none"> Use locally agreed triggers for transfusion based on national guidelines and use National Blood Transfusion Committee (NBTC) indication codes when requesting blood from the transfusion laboratory and when prescribing blood components Develop systems and protocols that empower transfusion laboratory staff to question requests that do not conform with these triggers and where inadequate clinical explanation is given Regularly audit transfusion requests against these triggers Transfuse one dose of blood component at a time e.g. one unit of red cells or platelets in non-bleeding patients and reassess the patient clinically and with a further blood count to determine if further transfusion is needed

B. Specific aspects of surgical PBM

<u>Preoperative Management of Anaemia and Haemostasis</u>
<ul style="list-style-type: none"> Provide arrangements for the timely identification and correction of anaemia before elective surgery which is likely to involve significant blood loss using WHO definitions of anaemia i.e. Hb in adult males <130g/L and adult females <120g/L
<ul style="list-style-type: none"> Develop and implement protocols for the management of patients taking anticoagulants and anti-platelet drugs that may increase the risk of bleeding
<ul style="list-style-type: none"> Avoid transfusion for managing anaemia if alternatives are available e.g. oral iron for iron deficiency anaemia and intravenous iron for functional iron deficiency
<u>Intraoperative Management</u>
<ul style="list-style-type: none"> Use intraoperative cell salvage for appropriate procedures
<ul style="list-style-type: none"> Use pharmacologic agents to reduce blood loss e.g. tranexamic acid
<ul style="list-style-type: none"> Maintain physiologic homeostasis (normothermia, acid-base management, normocalcemia, avoid over-treatment with intravenous fluid)
<ul style="list-style-type: none"> Use controlled hypotension whenever indicated and safe
<ul style="list-style-type: none"> Position patients to minimise central venous pressure and capillary oozing
<ul style="list-style-type: none"> Minimise surgical blood loss through use of new technologies (argon beam coagulator, radiofrequency dissecting sealer, etc.)

<u>Postoperative Management</u>
<ul style="list-style-type: none"> • Use postoperative blood salvage (washed, unwashed) where indicated
<ul style="list-style-type: none"> • Consider alternatives to transfusion for postoperative anaemia management (volume expanders, intravenous iron)
<ul style="list-style-type: none"> • Consider the effects of intra-operative fluid administration e.g. haemodilution leading to false Hb estimation

C. Specific aspects of medical PBM

<u>Management of abnormal haemostasis</u>
<ul style="list-style-type: none"> • Develop and implement a protocol for the management of reversal of warfarin, including the use of vitamin K and prothrombin complex concentrates
<ul style="list-style-type: none"> • Develop and implement a protocol for the management of abnormal haemostasis in patients with major haemorrhage e.g. acute upper gastrointestinal haemorrhage
<ul style="list-style-type: none"> • Develop and implement a protocol for the management of bleeding in patients taking novel anticoagulants (e.g. dabigatran, rivaroxaban and apixiban) and potent antiplatelet agents (e.g. prasugrel and ticagrelor)
<ul style="list-style-type: none"> • Use anti-fibrinolytics, e.g. tranexamic acid, for major bleeding
<ul style="list-style-type: none"> • Develop and implement a protocol for the management of severe thrombocytopenia in patients undergoing stem cell transplantation or intensive chemotherapy for malignant disease
<u>Management of anaemia</u>
<ul style="list-style-type: none"> • Identify and correct the underlying cause of the anaemia before considering transfusion, wherever possible
<ul style="list-style-type: none"> • Avoid transfusion for managing anaemia if alternatives are available e.g. oral iron for iron deficiency anaemia, intravenous iron for functional iron deficiency
<ul style="list-style-type: none"> • Make individualised plans for patients needing regular transfusion and consider the potential for complications of transfusion such as red cell alloimmunisation and iron overload and their management

D. Implementation of PBM

<u>Implementation of good practice for blood avoidance and the use of blood</u>
<ul style="list-style-type: none"> • Analyse casemix and clinical services to determine the main targets for PBM
<ul style="list-style-type: none"> • Identify PBM champions to help educate staff and patients
<ul style="list-style-type: none"> • Establish a PBM committee (either stand-alone or within the Hospital Transfusion Committee) to oversee the PBM programme
<ul style="list-style-type: none"> • Obtain a mandate for PBM from hospital management
<ul style="list-style-type: none"> • Educate clinicians about PBM and evidence-based transfusion practice
<ul style="list-style-type: none"> • Adopt a PBM scorecard to share with senior NHS Trust members to monitor adherence to guidelines for blood avoidance and the use of blood, including the use of benchmarking to identify clinicians/clinical teams who are consistently well outside of average blood use for a specific procedure

Responsibilities of staff involved in Patient Blood Management (PBM) at hospital level

1. Transfusion medicine physician

- Have comprehensive knowledge of technical and clinical aspects of transfusion science and blood component preparation and storage
- Be an expert in evidence-based utilisation guidelines, accreditation standards and policies
- Develop constructive working relationships with hospital major blood users
- Serve as clinical champion for PBM to peers and junior medical staff
- Advise on appropriate management of anaemia and haemostatic disorders
- Work with IT departments and others to develop IT systems to support PBM

2. Surgery/Anaesthesia clinicians

- Serve as clinical champions for PBM to peers and junior medical staff
- Advise on implementing intra- and postoperative cell salvage and other blood sparing techniques
- Identify and eliminate non-evidence based or wasteful transfusion practice
- Assist with establishing preoperative haemoglobin and haemostasis optimisation clinics, point of care testing and blood utilisation audit and benchmarking

3. Haematology/General Medicine physicians

- Serve as clinical champions for PBM to peers and junior medical staff
- Assist in establishing and maintaining haemoglobin and haemostasis optimisation clinics, and point of care testing
- Assist in reducing the amount and frequency of blood sample collection both for laboratory and point of care testing
- Advise on and implement appropriate management of anaemia and haemostatic disorders.

4. Transfusion nurse/practitioner

- Provide and/or facilitate transfusion-related education including for PBM throughout the hospital
- Ensure clinical transfusion incidents, transfusion reactions, specimen labelling errors are investigated
- Submit data to haemovigilance programmes
- Develop constructive working relationships with the many clinical users of blood products, and assist with the implementation of PBM programme
- Support local, regional and national transfusion audits by involving appropriate stakeholders to undertake data collection and implement quality improvements arising from audits.

5. Hospital management

- Ensure awareness of transfusion-related hospital accreditation requirements (CPA, MHRA, NHSLA, CQC)
- Identify ways of circumventing or eliminating barriers to change
- Provide liaison with hospital executive committee when necessary
- Provide information to support business cases for PBM including the expected savings of the implementation of PBM initiatives
- Provide information to transfusion laboratory and blood services regarding major changes planned to services that may affect the amount of blood components used

- Provide support for the use of IT systems to provide sustainable data for blood transfusion key performance indicators.

6. Transfusion Laboratory Manager

- Have comprehensive knowledge of technical and clinical aspects of transfusion science and blood component preparation and storage
- Be responsible for blood stock control and availability
- Be the key contact for queries/issues in the blood transfusion laboratory
- Support the provision of data for blood utilisation audit and benchmarking (and work with IT department/IT specialists)
- Empower laboratory staff to challenge clinicians about apparently inappropriate requests for blood components.

7. HTC/PBM subcommittee Chair

- Establish and lead the committee to oversee the PBM programme.
- Ensure engagement and support from senior management for PBM initiatives

8. Other specialists who should participate in PBM include:-

- Information technology specialists: Help with access to essential data for process improvement, assist in setting up computerised physician order entry programmes (CPOE) in with educational and reporting functions
- Patient advocate/expert.
- Clinical governance department/committee: Assist with the monitoring of quality standards and patient safety.
- Trust Board representative: Be a champion for PBM.

Issues to consider when implementing Patient Blood Management (PBM), including what data should be collected and how to measure progress

<ul style="list-style-type: none">• Establish what PBM measures have already been implemented e.g. guidelines for appropriate use of blood in different clinical settings and pre-operative anaemia management.
<ul style="list-style-type: none">• Establish mechanisms for determining how blood components are used e.g. by major medical and surgical diagnostic groups and by clinical team and individual clinician.
<ul style="list-style-type: none">• Audit the use of blood components against local and national guidelines and benchmark with other hospitals of similar size and case mix.
<ul style="list-style-type: none">• Develop the tools and opportunities for presenting blood usage and audit data back to clinical teams and individual clinicians.
<ul style="list-style-type: none">• Measure baseline data and establish mechanisms for monitoring parameters of PBM such as:<ul style="list-style-type: none">– Proportion of red cell, platelet and plasma units with pre-transfusion blood count/haemostasis testing and the clinical indication documented– Proportion of adult patients undergoing elective surgery where transfusion may be needed e.g. cardiac and orthopaedic surgery, and where preoperative anaemia screening was carried out at least 2 weeks before surgery– Proportion of adult patients undergoing elective surgery where transfusion may be needed e.g. cardiac and orthopaedic surgery, and where preoperative blood group and antibody screening was completed before surgery– Proportion of patients undergoing surgery where transfusion may be needed where intraoperative cell salvage and tranexamic acid were used– Proportion of medical staff trained in blood ordering

Work needed to support the implementation of Patient Blood Management (PBM)

The need for further work to support the implementation of *Patient Blood Management* was highlighted at the *Patient Blood Management: The Future of Blood Transfusion* conference.

Examples of the work needed include:-

- The development of a minimum dataset for patients receiving blood transfusion
- The development of standard terms for the collection of data on the reason for transfusion, as hospital coding information is not reliable for this purpose
- The development of key performance indicators for hospital transfusion practice
- Further development of electronic systems in hospitals for the collection of data to monitor the appropriate use of blood and measures for blood avoidance
- The development of a central mechanism for benchmarking blood usage and transfusion practice in hospitals
- The development of a tool to assess the resources, both staff and non-staff, required to implement *Patient Blood Management* at Trust level
- The development of national training and educational materials for *Patient Blood Management*, including e-learning programmes
- Continued development of patient information leaflets and transfusion awareness tools
- The development of NICE guidelines for transfusion.
- Commissioning of high quality clinical research (systematic reviews and clinical trials) on safe and effective transfusion practice including alternatives to blood transfusion

Several of these activities are already in initial development and will be placed on the *Patient Blood Management Toolkit* when progressed.