



Chief Medical Officer's National Blood Transfusion Committee

Development of an integrated blood shortage plan for the National Blood Service and hospitals

1.0 Executive Summary

- 1.1 The CMO's National Blood Transfusion Committee sub group on contingency planning has prepared an integrated plan which lists actions to be taken by both the National Blood Service (NBS) and hospitals in blood shortages. The two main aims of the plan are:-
- A reduction in hospital stock level to ensure more of the national 'pool' is available for essential transfusions
 - Overall blood usage is reduced to ensure that those patients with the greatest clinical need are treated.

A summary of this plan was issued via the NHS gateway to Chief Executives of Trusts on 23 July 2004 (gateway reference 3344).

- 1.2 The current NBS plan for managing blood shortages operates by restricting orders as they are placed. The system has a limited effect on hospital stocks and can lead to confusion over what action is to be taken both within the NBS and hospitals.
- 1.3 The new plan describes three phases, dependent on NBS stock levels – Green, Amber and Red. Hospitals are required to establish an Emergency Blood Management Group with a remit to produce and manage Emergency Blood Management Arrangements to cover all three phases.
- 1.4 Actions listed in Green phase are focused on preparing the arrangements required to be implemented in shortage and implementing the recommendations of the HSC 2002/2009 *Better Blood Transfusion*¹.
- 1.5 In Amber and Red phases further actions to improve the logistics of supply are recommended, these include a reduction in stockholding in hospitals and measures to further reduce blood usage. To help prioritise the patients who should be treated, as shortages become more severe, three broad patient categories are identified.
- 1.6 It is recognised that hospitals are at different stages of implementation of the *Better Blood Transfusion* initiatives. A benchmarking system will be established by the Department of Health to ensure that those hospitals which have already taken actions to reduce blood usage contribute less in shortage than those who have not.
- 1.7 The NBS will establish a system for monitoring reductions in usage and for contacting and discussing actions with those hospitals which do not voluntarily achieve the

reductions required. A Department of Health led Blood Supply Management Group will review these reductions in usage and advise Strategic Health Authorities on strategies to manage the supply to hospitals that are not making the required reductions in usage.

2.0 Background

- 2.1 The development of a contingency plan to ensure the effective use of available blood when blood stocks have fallen to very low levels is critical to ensuring transfusion support for patients on these occasions. The NBS has a plan for managing shortages but this has not been developed in conjunction with hospitals and, when it has been put into action, has not operated as effectively as planned, primarily because a set of actions across the NHS has not been agreed. Previous experience with shortages has demonstrated that a simple process of restricting orders as they are placed with the NBS by hospitals results in additional orders being placed by some hospitals and a large number of discussions on the treatment of individual patients between hospitals and NBS Consultants. Hospitals have asked advice from the NBS regarding the cessation of elective surgery in these circumstances and the NBS has not felt empowered to make these decisions. This lack of integration has been confusing for all parties.
- 2.2 Under the auspices of the Chief Medical Officer's National Blood Transfusion Committee (NBTC) a blood shortage contingency planning group has been formed with membership from within hospitals and the NBS. The contingency planning group has produced guidance for hospitals to enable them to develop emergency blood management arrangements which will form part of their overall contingency plans to manage both prolonged shortages (such as those that might arise following a significant reduction in blood donors) and also short term shortages (such as those that may be encountered by a severe influenza epidemic). This guidance has been extended by a clinical contingency planning group. Membership of these groups is listed in appendix 1. The plan has been approved by the National Blood Service's Appropriate Use group, the National Blood Transfusion Committee Executive Working Group and the NBS Executive. A summary of this plan was issued via the NHS gateway to Chief Executives of trusts on 23 July 2004 (gateway reference 3344).
- 2.3 This document provides an outline of the proposed plan, the focus of which is on red cells. Further work is required on the impact on platelet stocks in severe shortages.

3.0 Planning Principles

- 3.1 The plan is designed to ensure that hospitals and the NBS can work within a consistent, integrated framework across England and North Wales, working to ensure equal access for patients to available blood on the basis of need. This will be achieved by ensuring that those patients most in need receive the available supply and further ensuring that any reduction in usage is made from those patients who will be least affected. The plan has the following two key aims:-
- That the national "pool" of blood is available for all essential transfusions to all patients equally across the country (logistical actions)
 - That overall usage is reduced to ensure the most urgent cases receive the supply that is available (clinical actions).

- 3.2 The plan is designed also to build on actions taken by hospitals to improve transfusion effectiveness in line with the *Better Blood Transfusion* initiative. These actions are defined within the Department of Health Circular HSC 2002/009 *Better Blood Transfusion*¹. Within the framework, hospitals which have taken actions resulting in a reduction in the usage of blood will, at times of shortage, contribute less to a general reduction in blood usage to manage the shortage. It follows that those hospitals which have not implemented these actions will, within the framework, contribute more to a general reduction in usage to ensure the two key aims of the plan are achieved. It is planned to achieve this through the use of a benchmarking framework currently under development with the Department of Health.
- 3.3 A key principle of the plan is that shortage can, in most cases, be avoided by reducing the current usage of blood through appropriate use programmes. To achieve this hospitals should implement the guidance on *Better Blood Transfusion* provided in the HSC 2002/009. The National Blood Transfusion Committee has collated guidance on these programmes and is further developing a toolkit to support hospitals in this work, to be available soon. The potential for reducing inappropriate use in England and North Wales has been estimated at up to 18% of the current annual usage of red cells².

4.0 Plan Structure

- 4.1 The plan is structured to provide a framework of actions for the NBS and hospitals in three phases:-
- Green: “Normal” circumstances where supply meets demand
 - Amber: Reduced availability of blood for a short or prolonged period
 - Red: Severe, prolonged shortage
- 4.2 It is envisaged that each hospital will produce an Emergency Blood Management Arrangement (EBMA) for each of the above phases. Guidance to assist hospitals in the production of EBMA's can be found in section 6. This generic plan can be adapted and included in hospital emergency incident plans. The NBS will also develop plans for each phase. The NBS plans will include providing any press statements regarding the shortage, and any appeals for blood donors to ensure a consistent message is delivered to the general public.
- 4.3 By ensuring that all hospitals have EBMA's for shortage it is expected that, on declaration of a shortage by the NBS, all hospitals will invoke these plans at the same time, ensuring a swift response to the shortage.
- 4.4 As the Green phase of the plan applies to “normal” circumstances, the plan is, in effect, operating at all times. Hospital actions in this phase relate to the implementation of the *Better Blood Transfusion* Health Service Circular.
- 4.5 Hospital actions in the Amber and Red phases include actions to reduce stockholding of red cells and where required reduce usage.
- 4.6 A schematic summary of the plan is listed in appendix 3.

5.0 Operation of the Plan

5.1 Green Phase

- 5.1.1 In the Amber and Red phases hospitals will reduce their stockholding to levels defined using Blood Stocks Management Scheme (BSMS) data. It is planned that these levels will be provided to hospitals during the Green phase so they can be built into individual hospital EBMA's. It should be noted that minimum stock levels will apply so that hospitals do not run dangerously low at such times.
- 5.1.2 Following the development of a benchmarking framework hospitals will be divided into 3 performance categories. If a national percentage reduction in usage is required when a shortage is declared, hospitals in the 3 categories will be required to make different contributions to the overall percentage reduction.
- 5.1.3 The details of this benchmarking framework and the process by which it will be delivered are still to be defined. However, it should include the development of an EBMA and demonstrate evidence of appropriate use.
- 5.1.4 Hospitals will develop their EBMA's and lodge these within their emergency incident plans. The EBMA's will define which members of staff will participate in the shortage management and how a reduction in usage will be achieved.
- 5.1.5 During the Green phase the NBS will continue to develop communications and logistics plans to support hospitals as effectively as possible during shortages. A key set of actions for the NBS is to continually monitor NBS stock levels and take appropriate actions to maintain these. Should stocks begin to fall, the NBS will take action (as it does now) to increase collections from donors.
- 5.1.6 If these actions prove to be unsuccessful, the NBS will declare a shortage and communicate a move to the Amber phase. The NBS trigger point for amber is currently set at approximately two days' stock. However, should the NBS identify a severe, imminent threat to the blood supply the NBS may communicate a move directly to the Red phase of the plan.

5.2 Amber Phase

- 5.2.1 If NBS stocks fall to a pre-determined level, the NBS will communicate a move to Amber phase in most circumstances. This may apply to either a single blood group or to all blood groups.
- 5.2.2 This information will be communicated by fax, email and/or telephone, where appropriate. The information from the NBS will include the nature of the shortage and any actions which need to be taken by hospitals as part of their EBMA's.
- 5.2.3 In the first instance these actions will be to reduce immediately stockholding in hospitals to approximately 67% of their average stockholding level as recommended by the BSMS. This will be achieved by only ordering to replace stock to the lower stock level. The impact of this will be to reduce orders from hospitals as hospitals use their own stocks, and to ensure the national stock of blood in the NBS is available to all hospitals
- 5.2.4 If the shortage is caused by a short term reduction in the availability of donors (such as severe bad weather or an influenza outbreak), the implementation of these actions

by hospitals to reduce their stockholding may prove sufficient to manage the shortage.

- 5.2.5 If the shortage is more prolonged, it will be necessary to also reduce usage in hospitals. The NBS will communicate this information to hospitals. The communication will include details of the percentage reduction in usage required for each hospital according to the categories defined by the performance management framework. These percentages will be calculated according to a pre-defined algorithm. For shortages where the nationally required reduction in usage is quite small (for example less than 5%) it is anticipated that hospitals may be able to achieve this through the implementation of appropriate use measures. However, some hospitals may have to consider the cessation of procedures for patients in category 3 of the generic EBMA listed in section 6.3. In a prolonged shortage this will have an impact on waiting time targets.
- 5.2.6 The NBS will monitor activity using issues to hospitals as an indicator of usage. This monitoring will be undertaken daily and cumulatively to ensure peaks and troughs in activity are smoothed out. Hospitals that have not achieved the required reduction in usage will be contacted and options to further reduce usage will be discussed. A Department of Health led Blood Supply Management Group will review this information and may advise Strategic Health Authorities on strategies to manage the supply to hospitals that are not making the required reductions in usage.
- 5.2.7 If stocks of blood return to a sustainable level, the NBS will communicate to hospitals that the Amber level shortage no longer applies and that orders can return to normal. If, however, stocks continue to fall, the NBS may communicate that a greater reduction in usage is required which may require hospitals to take actions regarding treatment of the categories of patients in their EBMA.
- 5.2.8 A further fall of stocks may require the NBS to declare a Red level shortage.

5.3 **Red Phase**

- 5.3.1 The NBS will declare a Red level shortage if there is a severe, prolonged shortage of blood; e.g. a 50% loss of donors, or, if an imminent severe threat to the blood supply is identified.
- 5.3.2 The NBS will communicate the required actions. In the first instance these actions will be to reduce stockholding in hospitals to approximately 40% of their stockholding level as notified by the BSMS. This may be accompanied by a further reduction in usage. In this case it is likely that only patients in category 1 of the EBMA listed in section 6.3 will be treated.
- 5.3.3 As in the Amber phase the NBS will monitor activity using issues to hospitals as a proxy for usage.

6. Guidance for hospitals on development of an Emergency Blood Management Arrangement

6.1 Hospital actions may be separated into two parts:-

Green Develop hospital/trust specific hospital Emergency Blood Management Arrangements for introduction during times of blood shortage. Review current blood usage and implement, where possible, mechanisms to reduce blood usage.

Amber/Red Implementation of actions during shortage. This will involve the rationing and equitable distribution of blood. Implementation of an Emergency Blood Management Arrangement will require hospital-wide support.

6.2 Green Phase

6.2.1 Hospital actions to reduce allogeneic blood use

The Hospital Transfusion Team, recommended in HSC 2002/2009 *Better Blood Transfusion*, could be expanded to include involvement from a Consultant anaesthetist and Consultant surgeon with a specific remit to reduce allogeneic blood use. The team composition could therefore be:

Hospital Transfusion Team
The Haematologist responsible for Transfusion
Blood Transfusion Laboratory Manager
Transfusion Practitioners
Consultant Anaesthetist
Consultant Surgeon
Consultant representing Medical usage (unless Consultant Haematologist assumes this role)

6.2.2 This team, with the support of members of the Hospital Transfusion Committee (HTC), will plan and implement mechanisms to reduce blood usage in the Green phase. Action by all hospitals to reduce usage in Green phase is critical to reducing the likelihood of a shortage occurring.

6.2.3 In hospitals all available means should be used to ensure that blood is only transfused when it is clinically indicated. The hospital should implement the guidance on *Better Blood Transfusion* provided in the HSC 2002/009 and through the National Blood Transfusion Committee. Further development of the Better Blood Transfusion toolkit is in progress and will be available soon.

6.2.4 Development of a hospital contingency plan for blood shortages

In the event of a shortage, hospitals must have a workable hospital-wide shortage plan. This will only be achieved by obtaining the input of the major stakeholders in the decision making process. Each hospital should, therefore, form a group with executive powers – the Emergency Blood Management Group (EBMG). The membership of this group may vary from hospital to hospital. An example of the membership is tabled below.

Emergency Blood Management Group
Chief Executive or representative
Medical Director (possibly also CE's representative)
Clinical Director of Acute Medicine
Clinical Director of Surgery
Director of Nursing
Director of Operations
Clinical Director, Critical Care/Lead Clinical Anaesthetist
The Haematologist responsible for Transfusion
Chair of the HTC
Blood Transfusion Laboratory Manager
Specialist Practitioner of Transfusion
Clinical Risk Manager

- 6.2.5 This group should develop arrangements to manage the use of blood in each operational phase; Green, Amber and Red. These plans should include the actions listed in appendix 2.
- 6.2.6 Once the arrangements are formulated, in the Green phase they should be managed by the Hospital Transfusion Team or those deemed appropriate by the EBMG.
- 6.2.7 Should a national shortage occur, the NBS will notify the Transfusion Laboratory Manager by fax and email or telephone call, where appropriate. This communication will include the required reductions to stockholding or usage. The Transfusion Laboratory Manager, or deputy, should notify the Consultant Haematologist with responsibility for blood transfusion to take action to ensure the hospital arrangements are activated.
- 6.2.8 The hospital should ensure that communication lines are clear for the activation of the plan. For example, it may be decided that the Consultant Haematologist with responsibility for Transfusion will alert the EBMG which will prepare to actively manage the Emergency Blood Management Arrangements. As with any major incident or emergency plan, cover arrangements should be clear. Any shortage and its impact on patient care may need to be reviewed daily by a group of key staff. Hospitals can monitor their reduction in blood usage using BSMS data available on the BSMS website. The EBMG has responsibility for ensuring that this reduction meets the specified target. It may not be necessary for the membership to include all of the individuals listed above but the management arrangements and responsibilities must be clearly defined in the hospital's Emergency Blood Management Arrangements.
- 6.2.9 Each hospital's arrangements should be agreed and verified by key staff within the hospital. Final approval should be via the Trust Chief Executive. It is essential the arrangements have wide recognition to ensure their effectiveness when called into action. Staff should be aware of their existence and be willing to accept that a decision making process, however difficult, is necessary when the supply of blood is limited.

6.3 **Amber and Red Phases**

In shortage it may be necessary to restrict transfusions to those groups of patients in most need. In order to simplify the management of this, it is suggested that patients be divided into three broad categories.

Category 1	Category 2	Category 3
<u>Resuscitation</u> Resuscitation of life-threatening/on-going blood loss including trauma.		
<u>Surgical Support</u> Emergency surgery* including cardiac and vascular surgery**, and organ transplantation. Cancer surgery (probably curative).	<u>Surgery/Obstetrics</u> Cancer surgery (palliative). Symptomatic but not life-threatening post-operative or post-partum anaemia. Urgent*** (but not emergency) surgery.	<u>Surgery</u> Elective surgery which is likely to require donor blood support. Greater than 20% likelihood of patients requiring two or more units of donor blood.
<u>Non-Surgical Anaemias</u> Life-threatening anaemia including patients requiring in-utero support and high dependency care/SCBU. Stem cell transplantation or chemotherapy**** Severe bone marrow failure. Thalassaemias (but consider lower threshold). Sickle cell disease crises affecting organs. Sickle cell patients aged, ≤ 16 with past history of CVA.	<u>Non-Surgical Anaemias</u> Symptomatic but not life-threatening anaemia.	

* Emergency – patient likely to die within 24 hours without surgery.

** With the exception of poor risk ruptured aortic aneurysm patients who rarely survive but who may require large volumes of blood.

*** Urgent – patient likely to have major morbidity if surgery not carried out.

**** Planned stem cell transplant or chemotherapy should be deferred if possible.

6.3.1 **Hospital Action Plan – Amber Phase**

The NBS will send a fax informing the hospital Transfusion Laboratory that the national blood stocks have reduced to the level where hospitals should implement their Amber status contingency plan. The communication will indicate that stocks should be reduced to the pre-determined level and whether a percentage reduction in usage is required. The Transfusion Laboratory Manager or deputy will immediately copy the NBS correspondence to the Medical Director, Consultant Haematologist with responsibility for Transfusion and Chief Executive.

6.3.2 The Consultant Haematologist will authorise the introduction of the hospital's Amber action plan. Lead consultants and Directorate Managers will be informed immediately that the Amber plan has been implemented and the information will be cascaded to all medical staff.

6.3.3 The EBMG will meet to review the actions to be taken. This may include a review of theatre lists to ensure that patients in category 3 who will require blood transfusion support are deferred to ensure the hospital will reach the required reduction in overall usage. Where reductions do not reach the required level action to further reduce usage will need to be taken which may impact on patients in category 2.

6.3.4 Hospital Action Plan – Red Phase

The NBS will send a fax informing the hospital Transfusion Laboratory that the national blood stock has reduced to the level where hospitals should implement their Red status contingency plan. The communication will indicate that stocks should be reduced to the pre-determined level and whether a percentage reduction in usage is required. The Transfusion Laboratory Manager or deputy will immediately copy the NBS correspondence to the Medical Director, Consultant Haematologist with responsibility for Transfusion and Chief Executive.

6.3.5 The EBMG will convene and implement the Red status contingency plan. Lead consultants and Directorate Managers will be informed immediately that the Red plan has been implemented and this information must be cascaded to all medical staff. It is likely that only patients in category 1 of the EBMA will be treated.

6.4 Recovery from shortage

6.4.1 The NBS will send a fax informing the Transfusion Laboratory that stocks have risen to a level where hospitals can move to Amber or Green status. Hospitals should ensure that immediate demand does not return the national stocks to below critical levels by using a phased return to normal stock levels. The return to normal activity levels should similarly be phased, in particular, elective surgery backlogs should not be compressed into the immediate post recovery period.

6.4.2 The Transfusion Laboratory Manager or deputy will disseminate the information as above. The EBMG should convene at the earliest opportunity to review the effect of the blood shortage and amend the blood shortage arrangements as necessary. Any recommendations should be fed back to the Hospital Transfusion Committee.

7.0 References

1. Health Service Circular HSC 2002/2009; *Better Blood Transfusion – Appropriate Use of Blood*, Department of Health, 2002.
2. *Blood Conservation Strategies*, James, V. Appropriate Use Sub-Group of the NBS Blood and Tissue Safety Assurance Group, 2003.

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National Blood Service

**On behalf of the National Blood Transfusion Committee Contingency Planning Group
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Proposed generic actions for hospitals at each status level

Green Phase

- The hospital will work towards implementing the recommendations in HSC 2002/009 *Better Blood Transfusion – Appropriate Use of Blood*.
- Formulation of Emergency Blood Management planning group and development of Emergency Blood Management Arrangements (EBMA) for Green, Amber and Red phases.
- Establishing a Hospital Transfusion Team including a Transfusion Practitioner.
- Ensuring audit is undertaken so that blood usage figures for surgical procedures are available to advise which elective surgical procedures can be undertaken at amber and red shortage phases.
- Clinical audit of the use of blood against agreed guidelines.
- Implementing the Hospital Codes for Transfusion as recommended by the National Blood Transfusion Committee to ensure that every request for transfusion clearly states the indication for transfusion.
- Implementation of agreed transfusion protocols/ transfusion thresholds for all transfusions.
- Ensuring pre-operative assessment and action to correct anemia and defects in haemostasis, including adjustment of anti-thrombotic treatment prior to surgery.
- Maximise the use of intra-operative cell salvage for surgery with high blood loss (> 1 litre)
- Introduction of cell salvage techniques where appropriate.
- Rational coagulation replacement based on near-patient testing and laboratory monitoring.
- Pharmacological blood-sparing interventions, e.g. use of antifibrinolytics in surgery.
- Annual revision (or more frequently if indicated) of the maximum surgical blood ordering schedule, (MSBOS), for routine surgery.
- Use of I.V. iron therapy.
- Use of erythropoietin for agreed indications.
- Rational coagulation replacement based on laboratory monitoring.
- Introduction of electronic blood issue to reduce the stock of blood held in hospitals.
- Education/training sessions for staff of all levels, including induction and regular updates.
- Transfusion Guidelines formulated and included in the Junior Medical Staff induction.
- Hospital wide education of existence of EBMA.
- 24-hour reservation periods for blood components.
- Transfusion Laboratory Manager to perform monitoring of stock and wastage figures via participation in the Blood Stock Management Scheme.
- Transfusion Laboratory Manager to develop links with local hospitals with a view to movement of stock between sites.
- Advance notification to the Transfusion Laboratory Manager of any waiting list initiatives that could impact on the blood supply.

Amber Phase

- Reduce stockholding to the level notified by the NBS/BSMS
- Reduce usage to the level notified by the NBS.
- Operation by blood group for elective surgery depending on stock levels.
- Consideration should be given to reducing the transfusion trigger for all transfusions.

- In cases of actual or potential massive blood loss a Consultant Haematologist must be contacted by the referring clinical team to allow discussion and planning of patient management and blood product provision.
- All cases which are deemed to require transfusion outside of the indication codes for transfusion should be referred to a Consultant Haematologist.
- Reduction of the reservation period for blood to 12 hours wherever possible.

Red Phase

- Reduce stockholding to the level notified by the NBS.
- Reduce usage to the level indicated by the NBS.
- Daily review of the blood shortage and its impact on patient care by the EBMG.
- Medical assessment of all requests by a Consultant Haematologist.
- An order of priority based on clinical need.
- The establishment of links between hospitals to utilise regional stocks more effectively.
- The enactment of a predetermined policy on dealing with major bleeding that should include guidance on when to stop blood component support.

