



NTAG Plan to minimise health impact of red cell shortage (including COVID -19 Pandemic)

National Transfusion Advisory Group (NTAG) Plan for IBTS, HSE and Hospitals in the Republic of Ireland to address Red Cell Shortages Version 01/ September 2020

Authorised by:

Dr Joan Power, Clinical lead for Transfusion

Prof Stephen Field, Medical & Scientific Director, IBTS

Dr Michael Dockery, Chair, National Transfusion Advisory Group

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NTAG members

Chair Dr Michael Dockery, Deputy Chair Dr David Menzies, Ms Roisin Brady, Dr Valerie Broderick, Ms Marina Cronin, Dr Maeve Doyle, Prof Stephen Field, Mr Tony Finch, Ms Grainne Flynn, Mr Fergus Guilfoyle, Dr Mary Keogan, Dr Siobhan Kennelly, Mr Richard Lodge, Dr Peter McKenna, Dr Kieran Morris, Mr Damien Nee, Ms Maureen Nolan, Ms Norma O'Brien, Dr Hilary O'Leary, Prof Colm O'Morain, Mr Kevin Sheehan/Mr Barry Doyle, Ms Angela Petraska, Dr Joan Power, Prof Paul Ridgway, Mr Stephen Roe, Mr Keith Synnott

The NTAG Plan will be considered for update Quarter one 2022.



1.0 Approach and Development

- 1.1 The National Transfusion Advisory Group (NTAG) and Clinical Lead Advisor (CLA) for transfusion services have engaged with the Irish Blood Transfusion Service (IBTS), HSE, Irish Haematology Society (IHS), Academy of Clinical Science and Laboratory Medicine (ACSLM) and the National Haemovigilance Special Interest Group (NHV SIG) to agree a national framework plan for red cell shortage. This was undertaken through discussion and a review process with each stakeholder group. The plan is authorised by the CLA, Medical & Scientific Director IBTS and Chair NTAG. While this process was undertaken in the context of preparedness planning for sustainability and safety of the blood supply and services for the WHO declared COVID-19 pandemic, this plan will apply to red cell shortage arising from other all other circumstances.
- 1.2 At all times, all parties will work together to reduce the risk of red cell shortages through the management of both the supply and demand for blood. The uncertainty of the impact of COVID-19 on the blood supply is noted.
- 1.3 This plan updates the 2009 plans prepared in the context of Influenza (H1N1) pandemic and facilitates an updated, consistent approach at every hospital.
- 1.4 This plan aims to support a sustainable and safe clinical blood service on a national level, with consistent equity of access to patients across the country, so that blood (and in particular O Rh D negative red cells) is available for all essential transfusions and that overall usage is minimised to conserve stock and ensure that patients with the most urgent demand receive the available supply.
- 1.5 Public and stakeholder confidence in the blood service is important – public, professional users, donors, HSE acute hospital preparedness subgroup and the National Public Health Emergency Team.
- 1.6 This plan will assist hospital preparedness planning to minimise the health impact of potential red cell shortage and will be made available to the Consultant Haematologist, Chief/Senior Medical Scientist and chair of the Hospital Transfusion Committee at each of the hospital blood banks, which will in turn, ensure arrangements are in place in the off-site hospitals, for which they function as the blood bank.
- 1.7 Any change to component specification will be with agreement with the IBTS blood establishment (BE) regulator, HPRA.
- 1.8 This plan is supported by a platelet shortage plan, which operates in a similar way.



2.0 Contextual Background

2.1 In all circumstances of red cell shortage the following apply;-

- 2.1.1 Good Patient Blood Management (PBM), only giving blood and components where absolutely necessary, will safeguard stocks. The 'reservation period' for un-transfused, cross-matched red cells prior to return into general inventory should be reviewed and reduced in line with supply levels and clinical circumstances.
- 2.1.2 The IBTS will undertake clear communication and discussion with healthcare personnel responsible for transfusion activities (HSE acute services and inventory units, Hospital Lead Haematologist for Transfusion and Chief/Senior Medical Scientist Transfusion laboratories) to ensure all are aware of the situation and work to only use blood where clinically appropriate.
- 2.1.3 Clinical demand will be continuously assessed. Blood transfusion will be required for emergency, trauma, childbirth, severe anaemia, urgent surgeries etc.
- 2.1.4 Importation of blood components may be restricted by weather or other factors.
- 2.1.5 Current daily distribution of blood components in the cold chain delivery system may be impacted and the IBTS, C/SMS and HSE stock management Unit will work together to optimise availability and minimise component expiry.
- 2.1.6 Hospitals should report adverse incidents in patients or with the operation to this plan, through local governance systems, the IBTS complaints system and the NHO.

2.2 While this plan applies to red cells shortages arising from all circumstances, the 2020 context is preparedness planning for the COVID-19 pandemic.

- 2.2.1 COVID-19 is primarily a respiratory virus, spread by the respiratory route, however, it has the potential for impacting sustainability of the blood supply due to shortage of donors and/or staff, disruption of supplies of critical materials and equipment, which could compromise safety and adversely impact IBTS services as fresh supplies of blood components are required regularly. Donor selection measures are applied in line with guidance. Donor testing systems are not available. The introduction of pathogen reduction technology in this context is not supported by the WHO. Plasma distributed in Ireland is solvent detergent treated (SD plasma), which is an effective pathogen reduction technology for lipid enveloped coronaviruses. The main concern, in the context of the COVID -19 pandemic, is interruption to and sustainability of the blood supply.
- 2.2.2 Proportionate, precautionary actions to mitigate the possible risks to safety and sustainability are undertaken by the IBTS in real time and reviewed with the evolution of the outbreak in a manner consistent with governmental and public health policies.
- 2.2.3 There is evidence of a minimal increased COVID -19 patient demand (primarily patient management in ICU) and overall reduced demand where healthcare capacity shifted towards management of respiratory infection, with deferment of elective and non urgent clinical interventions.
- 2.2.4 Importation of blood components and access to NHSBT rare red cell frozen bank may be challenging with the COVID-19 demands on the UK blood services and transportation issues.



2.2.5 It is anticipated that recall events will increase.

3.0 Rationale

3.0 The framework described below is designed to ensure that all parties work in a consistent, integrated manner to manage blood shortages.

3.1 The appropriate use of donor blood and the use of effective alternatives to blood are important public health and clinical governance issues. This plan is designed to support actions taken by hospitals to improve transfusion safety and adopt Patient Blood Management principles.

4.0 Plan Structure

4.0 The plan is structured to provide a framework of actions at three phases. A schematic of the plan is shown in Appendix 1:

- **Green:** Normal circumstances where supply meets demand.
- **Amber:** Reduced availability of blood for a short or prolonged period.
- **Red:** Severe, prolonged shortages.

4.1 During the green phase, the IBTS will issue a precautionary notification to hospitals and the HSE informing them of potential supply chain issues should this arise, and asking hospitals to take appropriate action to protect the supply chain. This “pre-Amber” action is intended to prevent the requirement to move to Amber phase.

4.2 The IBTS will actively strive to minimise the risk of blood shortages. However, if red cell stocks fall to a pre-determined level, then, the IBTS may activate shortage plans and communicate a move to Amber phase. This may apply to either a single blood group or all blood groups. However, should IBTS identify a severe, imminent threat to the blood supply, then the IBTS may communicate a move directly to the Red phase.

Hospitals are required to have Emergency Blood Management (EBM) plans in place in order to respond to notifications from the IBTS. The response may require a reduction in both blood stocks and blood use. It is recommended that blood use should be prioritised according to the recommendations in Appendix 1.

5.0 IBTS Actions

5.1 National stock levels are monitored daily and production levels amended to ensure stock levels are kept at the pre-set target level. However, if this is not feasible/does not have the desired impact, a number of actions may be taken to impact supply and demand. If these actions prove to be unsuccessful, the IBTS will declare a shortage



6.0 Hospital Emergency Blood Management (EBM) Plans

It is recommended that each hospital should establish an Emergency Blood Management (EBM) group, reporting to the Chief executive Officer/Hospital Manager, as part of their overall emergency planning. The EBM group should have representation from the Clinical Lead, operational and risk management, key clinical users and the Hospital Transfusion Team. This group is responsible to provide strategic guidance and formulate arrangements to manage and confirm the appropriate use of blood in each operational phase, as part of their existing emergency plans.

- 6.1 Proposed generic actions for hospitals at Green, Amber and Red are outlined in Appendix 3. The choice of actions is dependent on the local case mix and configuration of services. Hospitals plans should clarify the roles and responsibilities of staff and give clear guidance for internal communication. Consideration should be given to centralising hospital stock and modification of surgical lists.
- 6.2 Once the arrangements have been formulated they should be managed by the Hospital Transfusion Team and re-enforced when required by senior clinical staff representing the main users of blood.
- 6.3 Should a national blood shortage occur, the IBTS will activate their emergency plan and will notify Consultant Haematologists and Chief/Senior Medical Scientists to implement the EBM Plan. In a shortage, actions within hospitals may need to be reviewed daily by either the EBM group or a nominated group of key staff.
- 6.4 It is essential that the EBM plan has senior hospital management support i.e. from the Chief Executive/Hospital Manager and Clinical Lead to ensure their effectiveness when they are called into action. Clinical 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.

7.0 Indications for Transfusion

- 7.1 The indications for transfusion are available at each hospital. Although it is accepted that clinical judgement plays an essential part in the decision to transfuse or not, practice should be evidence based and in the non-bleeding context a restrictive transfusion threshold should be applied with single unit transfusion. It should be noted that guidelines may change depending on new evidence and Hb threshold for transfusion may be reduced in severe shortage.
- 7.2 It is assumed that many patients undergoing elective surgical operations should not require transfusion support if their haemoglobin (Hb) concentration is normal before surgery. Active pre-operative anaemia and haemostasis management (inc. use of tranexamic acid, timely discontinuation of anti-platelet and anticoagulant medication, etc.) should be undertaken. Assuming normovolaemia has been maintained, the Hb can be used to guide the use of red cell transfusion. Single unit transfusion should be promoted with inter-unit Hb/patient assessment.
- 7.3 Measures to avoid the use of blood transfusion, including the use of alternatives to blood should be considered as part of patient blood management (PBM) even when blood stocks are normal. Particular attention to non-surgical management of bleeding, e.g. arterial embolisation, stenting or coiling of aneurysms might be considered as treatment options during blood shortages. Pharmaceutical alternatives-iron, EPO- should be used, as appropriate.



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Over dependence on group O RhD negative red cells has a negative impact on the management of this scarce resource. Blood services worldwide encounter recurrent shortfalls of O RhD negative red cells. The O RhD negative demand on the IBTS is already challenging. It is accepted that certain groups of patients benefit more than others from the use of this universal component. It is important that patients are prioritised with respect to their transfusion needs in order to identify those where the use of O RhD negative cells is essential. Group O

RhD positive red cells may be used for males and women of non-child bearing age (>55yrs) in whom anti-D antibody is not detectable. Requests for O RhD negative, CMV negative, Kell negative red cells should be clinically indicated. The current approach to neonatal transfusion support will be reviewed.

8.0 Operation of the Plan

8.1 Green Phase

- 8.1.1 Hospitals should ensure their EBM plan is current and integrate this within their emergency incident plans. The EBM plan will define which members of staff will participate in the shortage management and how a reduction in usage will be achieved.
- 8.1.2 During the Green phase IBTS will continue to develop communications and logistics plans to support hospitals as effectively as possible during shortages.
- 8.1.3 Use of red cells should be monitored to ensure appropriate use.

8.2 Amber Phase

- 8.2.1 If national stocks fall to a pre-determined level, or an imminent threat to the blood supply is identified without capacity to recover stocks, the IBTS will communicate a move to Amber phase, in most circumstances. This may apply to either a single blood group or to all blood groups.
- 8.2.2 Information from the IBTS about blood shortages will be communicated to hospitals by a number of channels e.g. electronic ordering system (EOS), email, telephone or mass messaging technology where appropriate. The information from the IBTS will include the nature of the shortage and any actions, which need to be taken by hospitals as part of their EBM plan. At this stage hospitals should activate their EBM plan to confirm any actions to be taken.
- 8.2.3 Hospitals may be expected to revise their stockholding during the Amber phase.
- 8.2.4 If stocks of red cells return to a sustainable level, the IBTS will communicate to hospitals the return to Green phase. If, however, stocks continue to fall, the IBTS may communicate that a greater reduction in usage is required. This may be within the Amber phase or be accompanied by the declaration of a move to Red phase.



8.3 Red Phase

8.3.1 The IBTS will declare a Red phase shortage if there is a severe shortage of red cells or if an imminent severe threat to the supply of red cells is identified

8.3.2 The IBTS will communicate with hospitals as in the Amber phase. Information will include the nature of the shortage and any actions that need to be taken by hospitals as part of their EBM plan- Actions will include a further reduction in stockholding and a reduction in usage by a percentage (based on normal use and clinical services currently delivered in any reorganisation)

9.0 Impact and monitoring of shortages

9.1 The uncertainty of blood supply through the COVID-19 pandemic acts as a reminder to ensure appropriate use of blood at all times.

9.2 A declared shortage scenario will need to be accompanied by a reduction in blood usage by hospitals.

9.3 Where the required reduction in usage is quite small, it is anticipated that hospitals will be able to achieve this through the implementation of appropriate use measures. In the context of COVID-19, reduction of elective surgery is a planned health care delivery strategy and many/most hospitals will have reduction/ cessation of procedures in category 3 (Appendix 2). This may achieve the required reductions in usage. However prolonged/ severe shortage will need reductions in usage to be achieved by cessation of some or all procedures in category 2. In a more severe shortage where, for example, 50% or more of the red cell supply becomes unavailable, it is likely that only patients in category 1 would be treated.

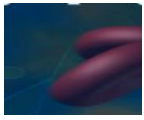
9.4 Hospitals should report adverse incidents in patients or with the operation of this plan through local governance systems, the IBTS complaints system and the NHO.

9.5 During shortages, the IBTS and clinical lead for transfusion services will monitor blood usage in hospitals. It is recognised that hospital case-load and case-mix varies and may be reorganised in this scenario, but where hospitals are unable to meet the recommended reductions in stockholding and use, the haematologist with responsibility for blood transfusion or the Chief/Senior Medical Scientist will be expected to discuss the hospital needs with an IBTS Consultant Haematologist. The IBTS will work closely with the IHS, ACSLM, National HV SIG and NTAG to support and share good practice.

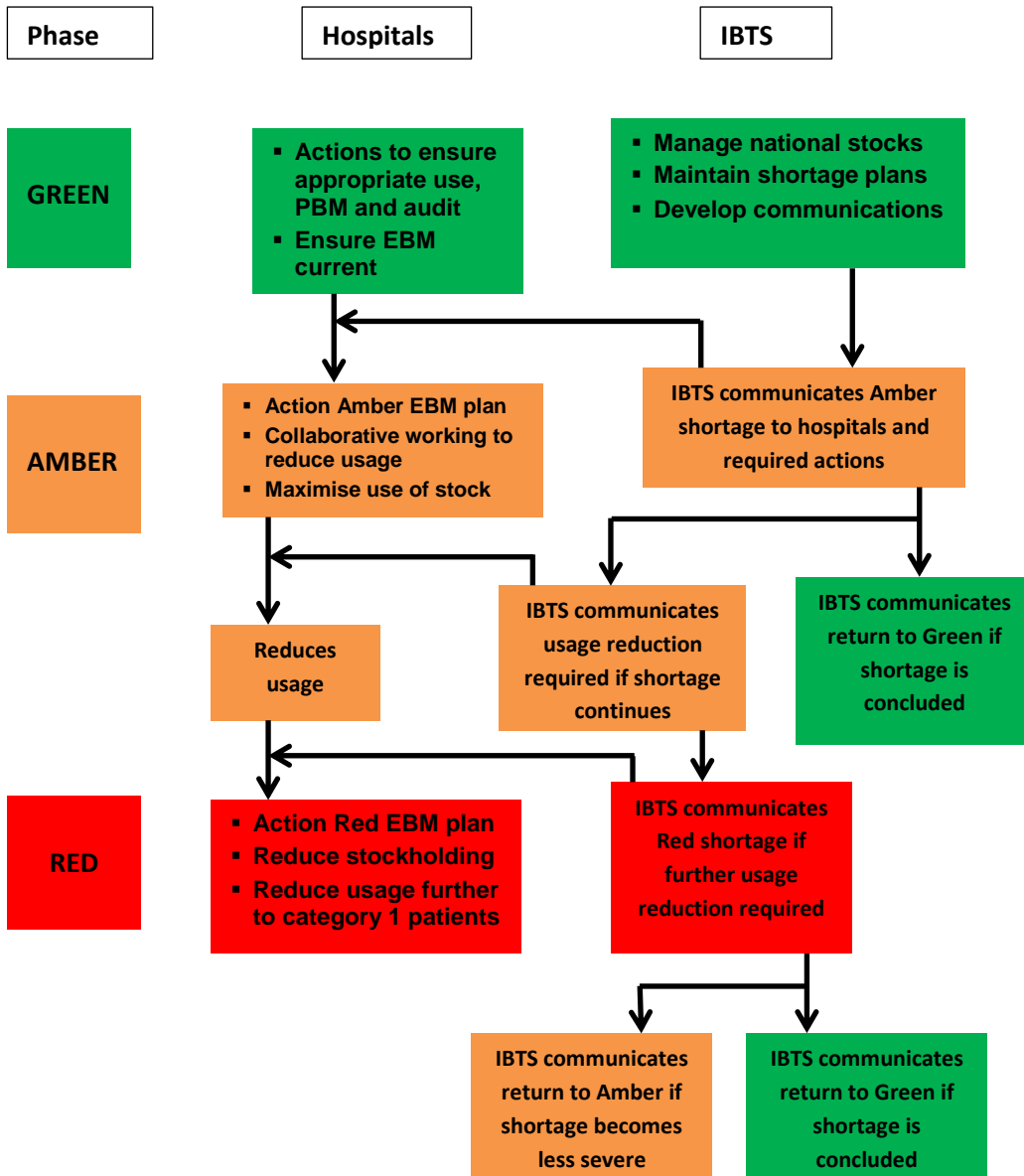
10.0 Recovery from shortages

10.1 IBTS will contact the Transfusion Laboratory to advise that stocks have risen to a level where hospitals can move to Amber or Green phase.

10.2 The Lead Haematologist for Transfusion and Chief/Senior Medical Scientist Transfusion laboratory, will disseminate the information as above. The EBM group should convene at the earliest opportunity to review the effect of the blood shortage and amend the local arrangements as necessary. The recovery plan should be communicated to staff. Any recommendations should be fed back to the Hospital Transfusion Committee and the IBTS.



Appendix 1: Schematic of red cell shortage plan





Appendix 2: Indication for transfusion

To simplify the management of patients in a general red cell shortage a traffic light system has been created using three broad patient categories. This is to assist hospitals prioritise patients to achieve the required reduction in red cell usage. It is recognised that clinical judgement is an essential part of decision-making for individual patients.

Category 1	Category 2	Category 3
These patients will remain highest priority of transfusion	These patients will be transfused in the Amber but not the Red phase	These patients will not be transfused in the Amber phase
Resuscitation Resuscitation of life-threatening/ on-going blood loss including trauma.		
Surgical support Emergency surgery* including cardiac and vascular surgery**, and organ transplantation. Cancer surgery with the intention of cure.	Surgery/Obstetrics Cancer surgery (palliative). Symptomatic, but not life-threatening post-operative or post-partum anaemia. Urgent*** (but not emergency) surgery.	Surgery Planned elective surgery which is likely to require donor blood support (Patients with > 20% chance of needing 2 or more units of blood during or after surgery).
Non-surgical anaemias 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.	Non-surgical anaemias Symptomatic, but not life-threatening anaemia.	

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

** With the exception of poor risk 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 should be discussed with IBTS Consultant Haematologists. SACT patients should be considered in line with NCCP advice and also blood supply



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Appendix 3: Proposed generic actions for hospitals at each phase

Green Phase

Secure appropriate arrangements for Patient Blood Management and the appropriate use of blood

- Secure senior management and Clinical Director's support for PBM and authorisation of hospital Emergency Blood Management (EBM) plan.
- Secure appropriate membership and functioning of the Hospital Transfusion Committee (HTC) and Hospital Transfusion Team (HTT) including staffing and resources
- Ensure that effective blood transfusion policies for the appropriate use of donor blood are in place, implemented and monitored.
- Ensure that education and training are provided to all staff involved in the process of blood transfusion and is included in the induction programmes for relevant new staff.
- Engage in local/ regional stock rerouting, that is effective in reducing transfusion of ORhD negative to RhD positive patients. Ensure red cells transferred between INAB accredited facilities in validated transportation is utilised at receiving hospitals.**

Ensure the appropriate use of blood and the use of effective alternatives in every clinical practice where blood is transfused

- Implement existing guidance on the appropriate use of blood and alternatives.
- Ensure that guidance is in place for the medical and surgical use of red cells, platelets and SD plasma.
- Ensure regular monitoring and audit of usage of red cells, platelets and SD plasma in all clinical specialities.
- Establish local protocols to now empower blood transfusion laboratory staff to ensure that appropriate clinical information is provided with requests for blood transfusion.
- Establish local protocols to now empower blood transfusion laboratory staff to query clinicians about the appropriateness of requests for transfusion against local guidelines for blood use.
- Develop policy on dealing with major bleeding, including guidance on when to stop blood component support

Secure appropriate and cost-effective provision of blood transfusion and alternatives in surgical and obstetric care

- Ensure that mechanisms are in place for the pre-operative assessment of patients for planned surgical procedures to allow the identification, investigation and treatment of anaemia and the optimisation of haemostasis.
- Ensure that an agreed list of indications for transfusion are established, in collaboration with key clinical specialities and are implemented and monitored.
- Ensure periodic review of the Maximum Surgical Blood Order Schedule MSBOS
- Develop a blood conservation strategy including the use of point-of-care testing for haemoglobin concentration and haemostasis and alternatives to donor blood such as peri-operative cell salvage and pharmacological agents such as anti-fibrinolytics and intravenous iron, and monitor its implementation.
- Ensure the establishment of procedures for the identification and management of maternal anaemia, in particular correction of iron deficiency, in the antenatal and postnatal period.

Amber Phase

- Continuation of elective surgery will depend on blood stock levels.
- Consideration should be given to reviewing the transfusion trigger for 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 deemed to require transfusion outside hospital guidelines for transfusion should be referred to a Consultant Haematologist.
- Hospitals may need to reduce stockholding and reduce the reservation period for blood to 12 hours, wherever possible.
- Active engagement in Blood Stock redistribution between Hospitals to reduce expiry

Red Phase

- Reduce stockholding to the level notified by the IBTS.
- Reduce usage to the level indicated by IBTS.
- Daily review of the blood shortage and its impact on patient care by the EBM group.
- Medical assessment of all requests by a Consultant Haematologist.
- An order of priority based on clinical need.
- Active engagement in stock redistribution between hospitals to utilise stocks more effectively.
- Activate policy on dealing with major bleeding including guidance on when to stop blood component support

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