National Blood Transfusion Committee

A Plan for NHS Blood and Transplant and Hospitals to address Platelet Shortages

Updated Version April 2023

1. Executive Summary

1.1 A working group of the National Blood Transfusion Committee (NBTC) was tasked with updating the plan for platelet shortages. The current document builds on the principles from the original plan of 2016 and subsequent plans.

1.2 Hospitals (including those in the private sector) and NHS Blood and Transplant (NHSBT) should work together to reduce the risk of platelet shortages through the management of both the supply and demand for blood components.

1.3 The objective is to ensure that patients who need platelets can receive timely transfusion support. The arrangements are designed to ensure that: -

- Platelets are available for all essential transfusions.
- Overall platelet usage is reduced to ensure supply remains available for the patients who need it most.

1.4 A shortage of platelets may be associated with a red cell shortage. Readers are referred to the NBTC webpage https://www.transfusionguidelines.org/uk-transfusion-committees/national-blood-transfusion-committee/responses-and-recommendations for guidelines to address red cell shortage.

1.5 Similar to the red cell short plan, the platelet shortage plan operates with four phases dependent on NHSBT stock levels - Green, Pre-Amber, Amber and Red (Appendices 1 & 2). As with the red cell plan, actions listed in the Green phase are focused on preparation of arrangements for shortages and implementing appropriate use recommendations.

1.6 This plan has been updated in response to the recent blood supply challenges

that have arisen and incorporates the use of new platelet components developed in response to these challenges.

1.7 A key action for NHSBT is to continually monitor its stock levels and take appropriate actions to maintain these. Should stocks begin to fall, NHSBT will act to increase production and, as feasible, increase collections from donors.

1.8 Within every Trust it is expected that the Emergency Blood Management Group (EBMG) established to produce arrangements for, and manage, red cell shortages will also be responsible for producing arrangements for, and managing, platelet shortages.

1.9 All organisations are encouraged to work within their Pathology Networks to provide additional mutual support, optimise regional stock management and minimise waste.

2.0 Background

2.1 The red cell shortage plan[1] includes a framework to manage shortages in a variety of situations. These also apply to platelets and are listed below:

- Short term shortages, for example, during bad weather or an influenza outbreak.
- Very acute shortages, for example, security issues which prevent donors coming forward to donate blood, industrial action, and adverse weather.
- Prolonged shortages which could result from several circumstances, for example, the introduction of further measures to reduce the risk of disease transmission by transfusion or changes in processing.
- Unexpected increases in demand for example following a major incident or mass casualty event

2.2 NHS emergency planning requires the development of contingency plans to ensure the effective use of available blood components when stocks fall to very low levels. Pre-determined plans will be critical to ensuring transfusion support remains available for the patients who need it most.

2.3 Recent experiences have shown the fragility of the blood supply chain when multiple factors are combined with other external issues such as industrial action. Levels of platelets have been at Pre-Amber for specific blood groups including Group A D negative at various times for prolonged periods.

2.4 In 2020, 2022 and 2023 the NBTC updated the integrated red cell blood shortage plan for NHSBT and hospitals [1]. An integrated, national plan should also be available for the management of platelet shortages to ensure the most effective use of this component.

2.5 This document provides details of the plan and hospitals are requested to amend emergency plans accordingly.

2.6 All references to providing, counting, or tracking of platelets refer to adult doses of platelets.

3.0 Rationale

3.1 The framework described below is designed to ensure that NHSBT and hospitals (including those in the private sector) in England work in a consistent, integrated manner to manage platelet shortages.

3.2 This plan is designed to be accessible to healthcare professionals even when there is no shortage. The appropriate use of platelets and the use of effective alternatives to platelets transfusion are important public health and clinical governance issues. This plan is designed to build on actions taken by hospitals to improve transfusion safety and effectiveness in line with the *Better Blood Transfusion* [2,3,4,] and Patient Blood Management (*PBM)* initiatives [5].

3.3 As with the blood shortage plan, the platelet shortage plan is designed to ensure hospitals (including those in the private sector) and NHSBT can work within a consistent, integrated framework across England to provide equal access for patients to the available units of platelets based on need. This will be achieved by making sure that those patients most in need receive the available supply and ensuring that any

reduction in usage affects only those patients who will be least impacted. The plan has the following two key aims:

- That the national “pool” of platelets is available for all essential transfusions to all patients equally across the country.

- That overall usage is reduced to ensure the most urgent cases receive the supply that is available.

3.4 The demand for platelets in England is significantly less than the demand for red cells and although some hospitals routinely hold lower stocks of platelets, most requests made to NHSBT are for specific patients. Consequently, in contrast to the red cell shortages plan, this plan will focus on restricting platelet supplies according to the urgency of treatment required by patient type, with a limited reduction in supply and stockholding.

3.5 Hospitals are encouraged to ensure that platelets are used only when necessary and usage follows the British Society for Haematology (BSH) guidelines [6] and Indication Codes for Transfusion [7].

3.6 In the development of the red cell shortage plan, hospitals are required to establish their Emergency Blood Management Group (EBMG) to define Emergency Blood Management Arrangements (EBMA). Hospitals are encouraged to use the same structures when implementing this platelet plan.

3.7 Platelet shortages may or may not occur at the same time as red cell shortages. Platelet shortages that occur when there are sufficient stocks of other blood components are only likely to be short-term in nature.

3.8 Activation of platelet shortage may apply to either a single blood group or all blood groups. This may impact on availability of special components such as HLA/HPA matched platelets.

3.9 Depending on availability of platelet stock, substitution across ABO groups, D type and CMV status may be required in line with BSH guidelines. Hospitals may be requested to accept ABO non-identical platelets where no ABO identical platelets are

available and offered both apheresis and pooled platelets except where there is a requirement for HLA/HPA matched platelets. Hospitals are referred to the guidance for substituting platelets.

4.0 Plan Structure

4.1 The plan is structured to provide a framework of actions for NHSBT and hospitals at four phase levels:

- Green: Normal circumstances where supply meets demand.
- Pre-Amber: Reduced availability of units of platelets without impact on clinical practice.
- Amber: Reduced availability of units of platelets with impact on clinical activity.
- Red: Severe, prolonged shortage with impact on clinical activity.

4.2 NHSBT will actively strive to minimise the risk of blood shortages. However, if platelet stocks fall to a pre-determined critical level, then NHSBT may activate shortage plans and communicate to Pre-Amber, Amber or Red phase after discussions have been undertaken with relevant approval bodies i.e., NHS England, Department of Health, and Social Care (DHSC).

4.3 During the Pre-Amber phase NHSBT may issue a precautionary notification to hospitals informing them of potential supply chain issues, such as a shortage in a particular ABO and D group or all groups. NHSBT will ask hospitals to take appropriate action to protect the supply chain. This action is intended to prevent the requirement to move to Amber phase.

4.4 It is envisaged that each hospital will produce an EBMA for each of the above stages. Guidance to assist hospitals in actions to be taken in EBMA can be found in Appendix 1. This plan should be included in hospital emergency incident plans. NHSBT will also develop plans for each phase.

4.5 By ensuring that all hospitals have EBMA for shortage it is expected that, on declaration of a shortage by NHSBT, all hospitals will invoke these plans at the same time, ensuring a swift response to the shortage.

4.6 As the Green phase of the plan applies to “normal” circumstances, the plan is, in effect, always operating. Actions in this phase will focus on ensuring arrangements for preventing and managing shortage are developed and that platelets are used safely and appropriately.

4.7 Hospital actions at Pre-Amber, Amber and Red phase include actions to limit any unnecessary stockholding of units of platelets and, where required, to reduce usage.

4.8 A schematic summary of the plan is listed in Appendix 2. A table categorising patient types to support decision-making in hospitals is provided in Appendix 3.

4.9 In situations where NHSBT restricts supply of platelets for stock holding, consideration will be given to offering ad hoc deliveries at a reduced cost to sustain the supply chain.

5.0 NHSBT actions

5.1 NHSBT will take several actions to avoid a shortage of platelets. National platelet stock levels are monitored on a daily basis and production levels amended to ensure stock levels are kept at the pre-set target level. However, if this does not have the desired impact several wide-ranging actions may be taken. These may include:

- Calling more donors (of all groups, or of a specific group, depending on the nature of the shortage).
- Increasing the number of whole blood donations collected into packs suitable for platelet production.
- Extending shifts in the manufacturing department to increase production of platelets.
- Extending the opening times of static clinics and mobile donor sessions (for the collection of whole blood donations).

- Increased monitoring and movement of the national stock ensuring stock is distributed according to age and group mix, to ensure wastage is kept to a minimum.
- Importing platelet units from other UK Blood Services.
- Modification of the platelet dose i.e., production of reduced-dose platelets.
- Suspension of some testing where appropriate i.e., production of 5-day platelets.

5.2 Depending on the actions applied in an individual situation the process may use the NHSBT emergency planning system.

5.3 If these actions are insufficient to mitigate blood supply issues in the short term, NHSBT will declare a shortage and communicate a move to the next appropriate phase.

5.4 NHSBT will send communications to Chief Executives, Medical Directors, Transfusion Laboratory Managers, Transfusion Practitioners, Chair of Regional Transfusion Committees, Consultant Haematologist with responsibility for Blood Transfusion and England Emergency Preparedness Resilience and Response (EPRR).

5.5 It is the responsibility of the hospitals (and other organisations), to inform NHSBT of any changes in contact details of the above listed positions.

5.6 As necessary, NHSBT will communicate with the Press and Politicians.

6.0 Hospital Emergency Blood Management Arrangements (EBMA)

6.1 It is recommended that each hospital should establish, as part of their overall emergency planning, an Emergency Blood Management Group (EBMG) with representation from the Medical Director, operational and risk management, key clinical users i.e., leads from Surgery, Anaesthetics, Maternity, Trauma/ED, Haematology, Medicine, and Hospital Transfusion Teams. Each hospital should have procedures on how a blood shortage is managed utilising existing emergency planning

/ business continuity arrangements (e.g., Bronze / Silver / Gold command and control structure). It is likely that required members of the EBMG will already be represented in existing structures, if not they should be incorporated. The responsibility of the EBMG is to provide strategic guidance and formulate arrangements to manage the appropriate use of platelets in each operational phase, as part of existing emergency plans.

6.2 Proposed generic actions for hospitals at Green, Pre-Amber, Amber, and Red are outlined in Appendix 1. 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.

6.3 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 platelets.

6.4 Should a national platelet shortage occur, NHSBT will activate the emergency plan and will notify Transfusion Laboratory Managers to implement the EBMA. In a shortage, actions within hospitals may need to be reviewed daily by either the EBMG or a nominated group of key staff.

6.5 It is essential that the EBMG have senior hospital management support i.e., from the Chief Executive and Medical Director 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 platelets is limited.

6.6 If an Amber shortage is declared, all requests to the transfusion laboratory should be vetted by laboratory staff and referred to hospital Haematology Specialist Registrar or Consultant if request falls outside the threshold given in Appendix 6. This should be used as guidance for transfusion thresholds.

6.7 If a Red Phase shortage is declared, all requests to the transfusion

laboratory should be vetted by a hospital Haematologist or other authorised persons for appropriateness and before the order(s) are placed to the local Hospital Services at NHSBT. Appendix 7 summarises the use of platelet transfusion in a RED alert. This should be used as guidance for transfusion thresholds.

6.8 In all delivery types, if Hospital Services is unable to meet a request, and no suitable alternative can be found, this will be referred to the on-call NHSBT Consultant.

7.0 Operation of the Plan

7.1 Green Phase

7.1.1 Hospitals will develop their EBMA and integrate these within their emergency incident plans. The EBMA will define which members of staff will participate in the shortage management and how a reduction in usage will be achieved.

7.1.2 During Green phase NHSBT will continue to develop communications and logistics plans to support hospitals as effectively as possible during shortages.

7.1.3 Hospital transfusion laboratory teams should enter component stock levels and wastage data into VANESA [8].

7.1.4 Hospital clinicians are recommended to use tools available to support decisions to administer transfusions and to consider alternatives to platelets including use of the Blood Components App [9].

7.1.5 Should NHSBT identify a threat to the platelet supply, it may communicate a move to Pre-amber.

7.1.6 If a severe, imminent threat to the platelet supply is identified, NHSBT may communicate a direct move to Amber or Red phase of the plan

7.2 Pre-Amber Phase

7.2.1 If stocks fall at one or more centres or in a particular ABO and D group, but the national stock remains above the pre-determined level, then NHSBT may ask hospitals to delay platelet transfusions or accept units of platelets of different ABO groups where possible (in line with BSH adult and paediatric guidelines). This will allow NHSBT to initiate stock transfers to balance the platelet stocks rather than declaring an amber shortage.

7.2.2 NHSBT will send communications to hospitals to undertake the following actions;

- Reduce stockholding of platelets where possible. Small reductions across many organisations across the country will make a big difference to the supply chain.
- Avoid requesting long dated platelets.
- If time permits for urgent requests, match ABO group, rather than rely on group A platelets.
- For routine requests group specific platelets should be provided if possible.
- Accept and use both apheresis and pooled platelets (except where there is a requirement for HLA/HPA matched platelets).
- Enter component stock levels and wastage data into VANESA [8].
- Refer to table in appendix 4 for additional advice on appropriate substitutions.
- Review the EBMA checklist (appendix 5).

7.2.3 Appropriate Use of Blood Components:
Hospital staff are directed to consider alternatives to transfusion, and to use tools such as the Blood Components App [9] summarising national clinical indications for transfusions and the Patient Blood Management toolkit; in this link [5].

7.2.4 Transfusion team should send communications to senior clinicians/high users about potential to move to Amber phase and the consequences of this.

7.3 Amber Phase

7.3.1 If NHSBT stocks fall to a pre-determined level where stocks are insufficient to ensure supply for a day, it will communicate a move to Amber phase.

7.3.2 This information will be communicated by several channels including messaging boards on the Online Blood Ordering System, email and/or telephone, where appropriate. The information from NHSBT will include the nature of the shortage and any actions which need to be taken by hospitals as part of their EBMA. At this stage, hospitals should activate their EBMA to confirm the local actions to be taken.

7.3.3 In the first instance, the actions will be to immediately reduce stockholding further in hospitals. This will be achieved by hospitals ordering only where there is a specific identified requirement for a platelet transfusion or for a unit of platelet to be on standby to cover a procedure. The desired outcome of this action by hospitals is to reduce the numbers of platelets ordered and therefore reduce the volume of platelets issued. During Amber phase this will ensure the national stock of platelets held by NHSBT is available to all hospitals.

7.3.4 In addition, to ensure the available national stock is used to its maximum effect, NHSBT may request hospitals to:

- Consider sharing platelets with other hospitals within the Trust, pathology network or local area.
- Enter daily component stock levels and wastage data at least weekly into VANESA [8].
- Restrict issues for use in accordance with identified categories of patient as defined in Appendix 3 and 6. If a reduction in usage is required at this stage, restrictions to supply will be limited to categories 1 and 2 (including HLA/HPA matched platelets). At this point all requests for units of platelets from the hospital must be authorised by a named clinician.
- Not request long dated platelet units.
- Accept platelets of a different ABO group (in line with BSH adult and paediatric guidelines).
- Accept leucodepleted platelets instead of CMV negative platelets.
- Accept D positive platelet units where D negative platelet units are not available, administering anti-D to D negative patients of childbearing potential where appropriate (250 IU anti-D will cover 5 adult units of platelets).

- Optimise pre-op preparation of patients e.g., stop anti-platelet agents 7 days prior to surgery whenever possible.

7.3.5 **Consider alternatives or additions to platelet transfusion e.g.,**

- Tranexamic acid - trauma, surgical bleeding and short-term for patients with chronic thrombocytopenia and bleeding.
- Desmopressin for patients with uraemia or inherited platelet disorders at risk of bleeding or bleeding if not contraindicated (e.g., due to age, ischaemic heart disease).
- Fibrinogen concentrate or Cryoprecipitate to maintain fibrinogen concentration at 1.5-2g/L if trauma or surgical bleeding.

7.3.6 NHSBT will monitor the demand, issues, and wastage of platelets from hospitals through VANESA.

7.3.7 If stocks of platelets return to a sustainable level, NHSBT will communicate to hospitals that the Amber phase no longer applies and that orders can return to Pre Amber or Green phase. If, however, stocks continue to fall, NHSBT may communicate that a greater reduction in usage is required which necessitates the declaration of a Red phase.

7.4 Red Phase

7.4.1 NHSBT will declare a Red phase shortage if there is a severe shortage of platelets or if an imminent severe threat to the supply of platelets is identified.

7.4.2 NHSBT will communicate with hospitals as in the Amber phase. The information will include the nature of the shortage and any actions that need to be taken by hospitals as part of their EBMA. Activities will include all actions taken under the Amber phase accompanied by a further reduction in usage such that usage will be restricted to patients in category 1 of Appendix 3 and transfusion threshold guidance given in Appendix 7 is followed.

7.4.3 NHSBT will take further actions to optimise platelet supply to complement those already taken in the Amber phase. These include:

- Importation of platelets from other UK blood services.
- Production of reduced-dose apheresis platelets.
- Production of 5-day platelets.

7.4.4 Hospitals will be encouraged to share platelets with other hospitals within the Trust, pathology network or local area.

7.4.5 Only hospitals who have been pre-approved by NHSBT (i.e., Major Trauma Centres and hospitals whose local Hospital Services is located a significant distance away) will be able to hold platelet stock.

7.4.6 Hospitals who have not been pre-approved to hold platelet stocks are advised in an emergency such as in a major haemorrhage or a bleeding patient with platelet below 50 $x10^9$ /L, to use platelets reserved for other patients i.e., Haematology/Oncology patients and to re-order.

7.4.7 Those hospitals not on the pre-approval list will need to request platelets on a named patient basis. All requests for platelets in the hospital must be made via a named senior clinician, such as a Consultant Haematologist. Requests to NHSBT may be referred to a NHSBT Consultant who may discuss the requirement with the requesting clinician. Requests from hospitals must be accompanied by the following dataset over and above the usual details provided to NHSBT when ordering platelets:

- Patient identifier (hospital number or name)
- Indication for platelet transfusion
- Requesting Consultants name
- Patient category (see Appendix 3)
- Patient blood group

7.4.8 As the availability of units of platelets will be very low in the Red phase, NHSBT will implement a review / vetting process to ensure appropriate ordering. NHSBT may need to triage platelet ordering to enable stock to be prioritised according to clinical need.

7.4.9 In Red phase, data entry into VANESA is mandatory, with input of daily stock levels and wastage.

7.5 Haemovigilance reporting

7.5.1. Any adverse events e.g., reduced-dose platelets issued by mistake to a bleeding patient (and where pooled standard dose platelets were available), delays in a necessary platelet transfusion or patients adversely affected by non-availability of platelets should be reported to Serious Hazards of Transfusion (SHOT) [11].

7.6 Recovery from shortage

7.6.1 NHSBT will inform the Transfusion Laboratory that stocks have risen to a level where hospitals can move to Pre-Amber, Amber, or Green phase.

7.6.2 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 platelet shortage and amend the platelet shortage arrangements, as necessary. Any recommendations should be fed back to the Hospital Transfusion Committee.

Appendix 1: Proposed generic actions for hospitals at each phase

Green Phase

- The hospital will work towards ensuring the safe and appropriate use of all platelets.
- Participation in the Blood Stocks Management Scheme [13] and enter daily component stock levels and wastage data into VANESA [8].
- Ensuring wherever possible that aspirin or other drugs affecting platelet function are stopped where appropriate prior to surgery in time to allow platelet function to recover.
- Formulation of Emergency Blood Management Arrangements (EBMA) for Green, Pre-Amber, Amber, and Red phase of a platelet shortage to ensure consistent action in hospitals so that the patients who require them most receive the available units of platelets.
- Ensuring clinical audit is undertaken against agreed guidelines so that the fate of all units of platelets is understood. This should include feedback to reduce any inappropriate use, implementation of best practice to ensure the appropriate use of platelets and to minimise wastage and re-audit to assess effectiveness of actions taken.
- Implementing the National Codes for Transfusion [7] as recommended by the National Blood Transfusion Committee and ensuring that every request for transfusion clearly states the indication for transfusion. Implementation of agreed transfusion protocols/transfusion thresholds for all transfusions.
- 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.
- Transfusion Laboratory Manager to develop links with local hospitals with a view to implement movement of stock between sites.

Pre-Amber Phase

- Enter daily component stock levels and wastage data into VANESA [8].
- Reduce stockholding of platelets where possible. Small reductions will make a big difference.
- Avoid requesting long dated platelets.
- If time permits for urgent requests, match ABO group rather than rely on group A platelets.
- For routine requests group specific platelets should be provided if possible.

- Accept and use both apheresis and pooled platelets (except where there is a requirement for HLA/HPA matched platelets).
- Refer to appendix 4 for additional advice on appropriate substitutions.
- Review the EBMA checklist (appendix 5).
- Start communications with senior clinicians/high users about the potential to move to Amber phase and the consequences of this.
- Any delays to transfusion or any avoidable transfusion incidents should be reported to Serious Hazards of Transfusion (SHOT) [11].

Amber Phase

- Restrict stockholding of units of platelets.
- Entry of daily component stock levels strongly recommended and wastage data (at least weekly) into VANESA [8].
- Maximise the use of available platelet units through:
- Interchangeable use of apheresis and pooled platelets (except for HLA/HPA matched platelets)
- Not requesting long-dated platelets
- Accepting platelets of a different ABO group (in line with BSH guidelines)
- Accepting leucodepleted platelets instead of CMV negative platelets
- Accepting D positive platelets where D negative are not available and administering anti-D to D negative patients of childbearing potential where applicable (250 IU anti-D will cover 5 adult units of platelets)
- Consider sharing platelets across Trusts where feasible to increase local pools/availability and across organisations
- Reduce usage to categories identified in communications from NHSBT. Ensure all requests are made by a senior clinician
- Identify alternatives to transfusion of platelets
- Monitor outcomes of platelet transfusions to inform further transfusion support required
- Any delays to transfusion or any avoidable transfusion incidents should be reported to Serious Hazards of Transfusion (SHOT) [11].

In all delivery types, if Hospital Services is unable to meet a request and no suitable alternative can be found; this will be referred to the on-call NHSBT Consultant.

Red Phase

- As in Amber phase but usage will be restricted to category 1 patients only.
- Provide information to NHSBT to assist with tracking of units of platelets through entry of daily component stock levels into VANESA [8] , (mandatory) and supply of wastage data immediately upon wastage of unit (this may be daily) or if local traceability procedures do not allow at least weekly.
- Restrict stockholding of units of platelets to Major Trauma Centres and other Hospitals/Trusts who have been pre-approved.
- Determine which requests will:
  - Require local Haematology Consultant approval
  - Be pre-approved by the local Haematology Consultant

Reduced-dose Platelets

- Reduced-dose apheresis platelets (if available) will only be issued in a situation where there is a significant national platelet shortage that is affecting patient care (a red alert level for platelet shortage has been called or without this measure being implemented a red alert level for platelet shortage would be called within the next 7 days). During this time, platelets should only be used when essential for prophylaxis or urgent surgery, in line with Appendix 7.
- Hospital laboratory staff and transfusion teams are recommended to follow the guidance[10] on the use of this component. When implemented reduced-dose apheresis platelets will automatically be issued by NHSBT. This will optimise the supply of platelets to all hospitals. Oldest platelet components will be issued first. These could be standard-dose apheresis, reduced-dose apheresis, or pooled platelets.
- Neonatal Platelets will not be affected (no changes to component).
- Pooled platelet components will be unaffected.
- HLA or HPA-selected platelets may not be available. All requests for HLA or HPA selected platelets will need to be approved by a Haematology Consultant at the hospital, use of random donor ABO-matched platelets is advised if these are unavailable.

Key messages for Transfusion Laboratory Staff & Hospital Transfusion Teams [10] can be found in this link.

- It is acceptable to use a reduced-dose apheresis platelet component instead of a standard-dose platelet component in a severe platelet shortage for older children (≥ 1 year) and adults requiring prophylactic platelet transfusions.
- Standard-dose pooled platelets should be used for patients with bleeding.

- When ordering on OBOS, state requirement for pooled platelets in the line notes (should only be specified for patients who are bleeding or to meet demand for potential major haemorrhage / trauma patients e.g., for Major Haemorrhage packs).

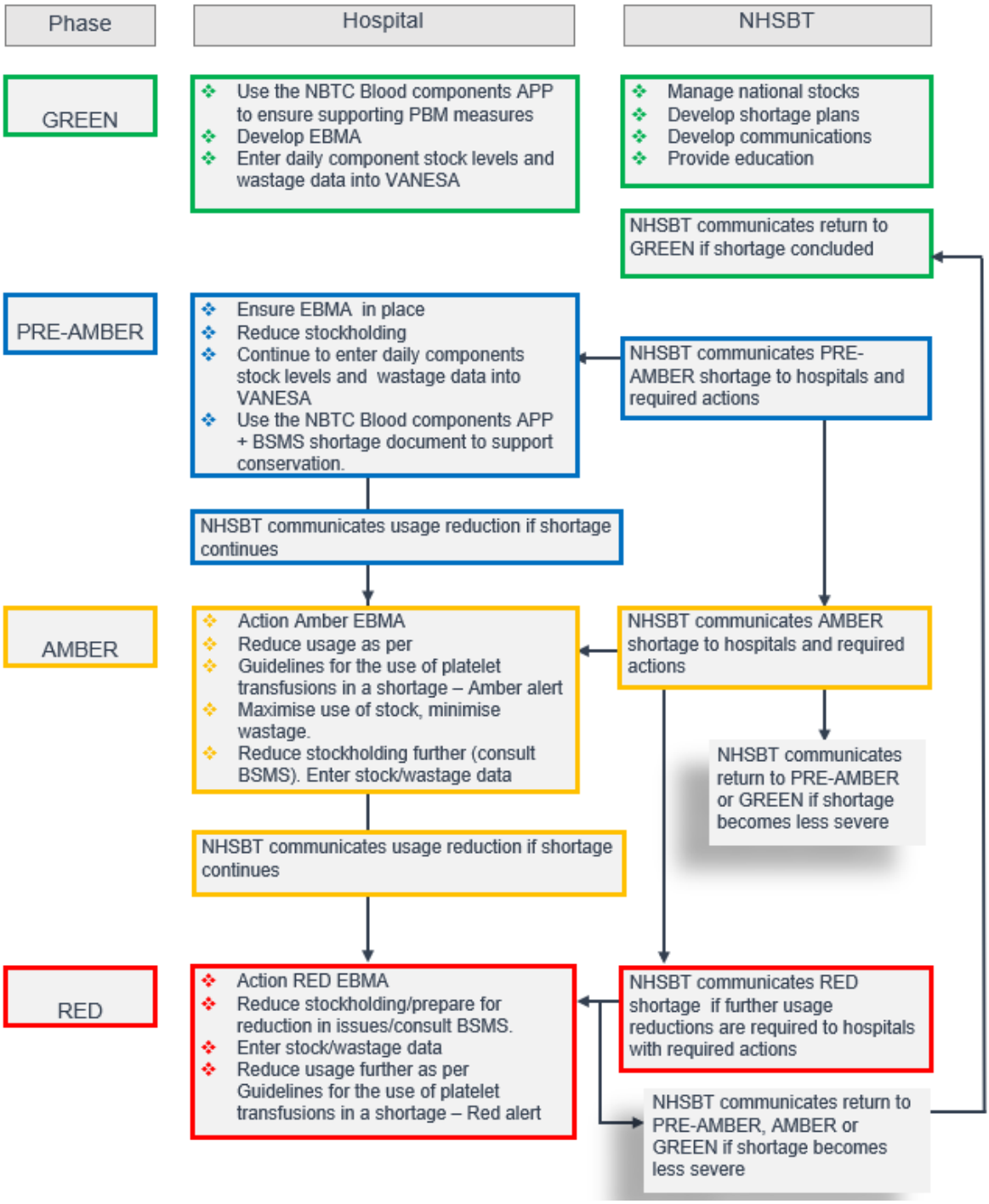
- Irradiated reduced-dose apheresis platelets will be available to order for patients with this indication.
- Any delays to transfusion or any avoidable transfusion incidents should be reported to Serious Hazards of Transfusion (SHOT) [11].

Key messages for Hospital Clinical Teams [11] can found in this link

- Tell the transfusion laboratory the reason for any platelet requests (major bleeding, major procedure, or prophylaxis).
- Use reduced-dose apheresis platelets for prophylaxis (to prevent bleeding).
- Use pooled platelets (if available) for major haemorrhage / actively bleeding patients / major procedures.

In all delivery types except, if Hospital Services is unable to meet a request and no suitable alternative can be found, this will be referred to the on-call NHSBT Consultant.

Appendix 2: Schematic of Platelet Shortage Plan



VANESA - Data entry recommendations

Green	Daily component stock levels advised. Wastage data at least monthly advised.
Pre-Amber	Daily component stock levels strongly recommended. Wastage data at least monthly advised.
Amber	Daily component stock levels strongly recommended. Wastage data at least weekly advised.
Red	Daily component stock levels mandatory. Supply wastage data immediately upon wastage of unit (this may be daily) or if local traceability procedures do not allow at least weekly.

Appendix 3: Categorisation of Patient types

The following table provides general guidance for the use of platelet transfusions in the context of reduced availability of all platelet groups. Maximise use of available platelet units by following recommendations in Appendix 1 (Amber alert section). Category 1 patients are those with the greatest clinical need for platelet support and therefore should be given priority in Red phase when considering allocation of platelets. In Amber phase, if reduction in usage is required, restrict to using in category 1 & 2 patients. Category 3 patients should be given lowest priority. The use of platelets should be considered as one therapeutic option in the overall management of these patients. Platelet transfusion should be guided by the clinical condition of the patient and by the use of laboratory tests and/or near patient testing if available.

OPTIMISE ALL PATIENT BLOOD MANAGEMENT STRATEGIES			
Category 1 ***(Red Phase)***	**Category 2**	**Category 3** ***(Amber Phase)***	
Patients to be transfused (follow appendix 7 for thresholds)	***Patients NOT to be transfused in Red Phase*** *(Follow appendix 7)*	***Patient to be transfused*** *(Follow appendix 6)*	***Patient not to be transfused*** *(Follow appendix 6)*
1. Resuscitation /Bleeding▲ a. Resuscitation of life-threatening /on-going blood loss including trauma. If ongoing major haemorrhage with expected poor prognosis *, review appropriateness of continuing transfusion support ***b.*** Bleeding in the presence of sepsis/acute DIC, BMF, Immune thrombocytopenia **2. Surgery** * a. Priority 1a ▲ procedures can be supported with platelets with exceptions ** b. Priority 1b emergency procedures **CANNOT** be supported with platelets if they go ahead. These should be reviewed on a case-by case basis e.g., taking into consideration blood	**1. Surgery*** a. Cancer palliative surgery. b. Priority 2 and 3 surgeries. Consider postponing surgery likely to require donor platelet support on a case-by-case basis e.g., taking into consideration blood group and correction of thrombocytopenia. **2. Critical care patients** resuscitated following massive transfusion with no on-going active bleeding **3. Non-surgical thrombocytopenia** **4. Bone marrow failure syndrome** on intensive treatment but with no active bleeding **5. Invasive procedures**	***1.* Invasive emergency procedure with high-risk bleeding▲** Use guidance from appendix 6 for thresholds. ***2. Bone marrow failure♦*** Patients receiving intensive chemotherapy including following allogeneic stem cell transplant. Transfuse with reduced-dose apheresis platelet ♦ (if available) according to Amber thresholds.	**1. Surgery*** Consider postponing priority 4 surgery which is likely to require donor platelet support on a case-by-case basis e.g., taking into consideration blood group and correction of thrombocytopenia **2. Procedures with low-risk bleeding** **Do not give prophylactic platelet transfusions in:** **3. Bone marrow failure syndromes** Not receiving intensive treatment **4. Auto BMT** **5. Thrombocytopenia congenital/ acquired platelet defects**

group and correction of thrombocytopenia. 3. **Non-surgical conditions** a. Thrombocytopenia with bleeding including patients requiring in-utero ▲ support and neonates▲ in high dependency care/SCBU. b. Patients already started stem cell transplantation♦, or chemotherapy♦ with bleeding or additional risk factors for bleeding			
Consider delay in starting a. Stem cell transplantation or chemotherapy b. Living related organ transplantation c. Cadaveric organ transplants, if possible, particularly if large volume of blood may be required i.e., cardiac / liver transplant			

*Clinical Guide to Surgical Prioritisation from Federation of Surgical Speciality Associations

▲Use standard dose platelets

♦Use reduced-dose apheresis platelets

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

** Except for poor risk aortic aneurysm patients who rarely survive but who may require large volumes of blood.

Appendix 4: Platelet Substitution

ABO non-identical platelets may be given at times of shortage or in an emergency, where no ABO identical platelets are available.

They may also be used when specific requirements are necessary, the blood group is unknown or to prevent wastage due to expiry. High Titre (HT) negative platelets are available to reduce the risk of haemolysis.

Recipient group	Group O	Group A	Group B	Group AB	Unknown
1st Choice	**O**	**A**	**B**	**AB¥**	**AB¥**
2nd Choice	A or B	AB¥	AB¥	A* or B*	A* or B*
3rd Choice	AB¥	B* or O*ϕ	A* or O*ϕ	O*ϕ	O*ϕ

For A or B units transfused into an O patient, or when AB is transfused, high-titre (HT) negative is not required.

* HT negative anti-A and/or anti-B platelets should be selected where available which would lower the risk of haemolysis.

ϕ Group O platelets for non-group O neonates and children should be avoided where possible due to the risk of haemolysis.

¥ Due to the population distribution of group AB and its value as a universal plasma donor, stocks may be limited.

Guidance on D selection and anti-D prophylaxis

D negative platelets should be given to D negative patients where possible, particularly to D negative women of childbearing potential, boys under 18 years and those who already have anti-D antibodies.

D positive may be transfused if D negative unavailable. In the case of women of child-bearing potential, anti-D prophylaxis should be given.

Appendix 5: Emergency Blood Arrangement Checklist

Checklist: Emergency Blood Management Arrangements

NHS Blood and Transplant

This guidance has been developed in conjunction with the National Blood Transfusion Committee (NBTC) red cell, platelet and plasma shortage plans and aims to create a short and concise series of steps to follow in the case of shortage.

Click on the white boxes to tick each step

Checklist for green

This is the business as usual phase of the EBMA

Clinical teams to ensure:

1. your EBMA plan is up to date
2. members of Emergency Blood Management (EBM) Group are aware of the plan
3. PBM strategies (anaemia treatment, cell salvage, adherence to national indication codes) are followed
4. familiarity with trust Emergency Preparedness Resilience and Response (EPRR) plans and command structures
5. communications are drafted for use if a move to amber/red is required
6. stock confirmation of Anti D, Tranexamic acid, Fibrinogen, Albumin, Lyoplas, Octaplas and Desmopressin - ensure process to order additional stocks is established
7. process agreed for the review of appropriateness of blood requests with haematology clinicians as needed
8. daily stock levels and wastage are entered into VANESA

Checklist for pre-amber:

1. Ensure EBMA arrangements in place
2. Reduce stockholding (inc. remote fridges)
3. Enter daily stock levels and wastage into VANESA
4. Use the NBTC Blood component APP to ensure supporting PBM measures

Checklist for amber

NHSBT will inform transfusion team that amber alert declared.

General:

1. Activate EBMA and convene EBM group
2. Prepare to report stock levels and decisions made by EBM group for escalation trust-wide
3. Arrange trust-wide communications (screensavers, emails, newsletters)
4. Review satellite fridge stock
5. Consider pharmaceutical alternatives in appropriate patients with EBM group and disseminate decision
6. Contact areas where transfusions may stop
7. Reprioritise prophylactic transfusions
8. Enter daily stock levels and wastage into VANESA

Red cells:

1. Consider, are all PBM methods being used, review scale up?

Platelets:

1. Use reduced dose platelets (if available) for non bleeding patients
2. Consider D positive platelets for D negative patients (cover with anti-D)

Plasma:

1. Consider conserving AB plasma for group AB patients

Checklist for red

The move to red phase will be communicated to trusts if there are severe shortages of either red cells, plasma or platelets.

Complete all amber actions.

General:

1. Launch rota for senior haematology clinicians to support laboratory in vetting requests
2. Update communications to reflect change to red phase
3. Remove all stock from satellite fridges except emergency group O from acute areas e.g. ED and maternity
4. Contact clinical areas where transfusions will not take place.

Recovery phase:

NHSBT will inform the transfusion team of return to 'green' phase.

1. Convene the EBM group
2. Ensure that change in clinical activity reflects blood stock levels
3. Use trust-wide communications to update staff

CLICK HERE for more information

Appendix 6: Summary of Guidelines for the Use of Platelet Transfusions in Amber Alert

British Society for Haematology Guideline (2016) **Adults**
British Society for Haematology Guideline (2016 & 2020 addendum) **Children, Neonates**

Platelet transfusion: principles, risks, alternatives, and best practice

Platelet transfusions are an essential component in the management of selected patients with thrombocytopenia. However, they need to be used judiciously as they are a limited resource and are not risk free

Prior to prescribing a platelet transfusion consider:

What is the indication for transfusion in this patient?	Are there any alternatives which could be used instead?	Is the patient aware of the benefits, harms, and alternatives to a platelet transfusion?

Possible alternatives to platelet

- Apply surface pressure after superficial procedures and correct surgical causes for bleeding
- Surgical patients expected to have at least a 500 ml blood loss (or >10% blood volume in children), use tranexamic acid (TXA) unless contraindicated
- Trauma patients who are bleeding or at risk of bleeding, early use of TXA
- Severe bleeding replace fibrinogen if plasma concentration less than 1.5 g/L
- Anti-platelet agents - discontinue or if urgent procedure/bleeding use TXA if risk/benefit would support
- Uraemia with bleeding or pre-procedure – dialyse, correct anaemia, consider desmopressin
- Inherited platelet function disorders - specialist haematology advice required. Consider desmopressin
- Chronic Bone Marrow Failure (BMF) with bleeding – consider TXA

Indication for use of platelet transfusion in adults and children (AMBER ALERT)	Transfusion threshold/not indicated
Prophylactic use (No bleeding or WHO grade 1) - one adult dose required (or weight-based paediatric equivalent)	
• Reversible Bone Marrow Failure, including allogeneic stem cell transplant • Critical illness • Reversible and Chronic Bone Marrow Failure receiving intensive therapy • Chronic Bone Marrow Failure to prevent persistent bleeding of grade > 2	10×10^9/L 10×10^9/L 10×10^9/L Count variable
• Chronic stable Bone Marrow Failure, abnormal platelet function, platelet consumption/ destruction (e.g., DIC, TTP) or immune thrombocytopenia (ITP, HIT, PTP) • Reversible BMF with autologous stem cell transplant (patient stable)	NOT INDICATED
Prophylactic use in presence of risk factors for bleeding (e.g., sepsis, abnormalities of haemostasis)	
• Reversible/chronic bone marrow failure, or critical care	10 to 20 x 10^9/L
• Abnormal platelet function, platelet consumption/destruction (e.g., TTP), immune thrombocytopenia	NOT INDICATED
Pre-procedure	
• Central venous catheter (CVC) tunnelled or untunnelled (excluding PICC line) • Lumbar puncture* • Percutaneous liver biopsy • Major surgery • Epidural anaesthesia, insertion & removal • Neurosurgery or ophthalmic surgery involving the posterior segment of the eye	20×10^9/L 40×10^9/L 50×10^9/L 50×10^9/L 80×10^9/L 100×10^9/L
• Bone marrow aspirate or trephine biopsies, PICC line insertion, traction removal of central venous catheters (CVCs), cataract surgery, other procedures with low risk of bleeding	NOT INDICATED
Therapeutic use (Bleeding WHO grade 2 or above)	
• Severe bleeding • Multiple trauma, brain or eye injury, spontaneous intracerebral haemorrhage • Bleeding (WHO grade >2) but not severe • Bleeding in specific clinical conditions – see table next page for indications	50×10^9/L 100×10^9/L 30×10^9/L

Indication for use of platelet transfusion in neonates (AMBER ALERT)	Transfusion indicated (threshold) / not indicated
Prophylactic use (No bleeding or WHO grade 1)	
• Neonate (including very pre-term) • Neonate with NAIT (no family history of ICH)	25 x 10^9/L 25 x 10^9/L
Prophylactic use in presence of risk factors for bleeding (e.g., sepsis)	
• Preterm neonate with sepsis • Neonate with NAIT (Family history of ICH)	25 x 10^9/L 50 x 10^9/L
Pre-procedure	
• Lumbar puncture* • Major surgery • Neurosurgery	40 x 10^9/L 100 x 10^9/L 100 x 10^9/L
• Procedures with low risk of bleeding	NOT INDICATED
Therapeutic use (Bleeding WHO grade 2 or above)	
• Severe bleeding	100 x 10^9/L
Specific clinical conditions	
Platelet function defect	
• Congenital – Pre-procedure or therapeutic use. When alternative therapy contraindicated or ineffective. Directed by specialist in haemostasis. • Acquired (anti-platelet agents, uraemia)- only indicated for severe bleeding	Count Variable
Disseminated intravascular bleeding	
• Pre-procedure or therapeutic use. Consider threshold counts above but may not be achievable and individual case review required	Use pre-procedure or therapeutic threshold as guide
Thrombotic thrombocytopenic purpura	
• Platelet transfusion contraindicated	unless life-threatening bleeding
Immune thrombocytopenia (excluding NAIT)	
• (ITP, HIT, PTP) Pre-procedure when other therapy ineffective or procedure urgent or to treat severe bleeding. Consider threshold counts above but may be unachievable or unnecessary and individual case review required	Use pre-procedure or therapeutic threshold as guide
Footnotes	
*It is accepted that prior to lumbar puncture some clinicians will transfuse platelets at higher counts (e.g., 50 x 10^9 /L) in clinically unstable children, non-ALL patients, or for the first LP in newly-diagnosed ALL patients to avoid haemorrhage and cerebrospinal fluid contamination with blasts, or at lower counts (≤ 20 x 10^9 /L) in stable patients with ALL, depending on the clinical situation. These practices emphasise the importance of considering the clinical setting and patient factors.	
Abbreviations	
ALL acute lymphocytic leukaemia; BMF bone marrow failure; DIC Disseminated intravascular coagulation; HIT heparin-induced thrombocytopenia; ICH intracranial haemorrhage; ITP primary immune thrombocytopenia; LP lumbar puncture; NAIT neonatal alloimmune thrombocytopenia; PICC peripherally inserted central catheter; PTP post-transfusion purpura; TTP thrombotic thrombocytopenic purpura:	

Appendix 7 Summary of Guidelines for the Use of Platelet Transfusion in RED Alert

British Society for Haematology Guideline (2016) **Adults**
British Society for Haematology Guideline (2016 & 2020 addendum) **Children, Neonates**

Platelet transfusion: principles, risks, alternatives, and best practice

Platelet transfusions are an essential component in the management of selected patients with thrombocytopenia. However, they need to be used judiciously as they are a limited resource and are not risk free.

Prior to prescribing a platelet transfusion consider:

What is the indication for transfusion in this patient?	Can the procedure or intervention be delayed?	Are there any alternatives to platelet transfusion?	Is the patient aware of the benefits, harms, and alternatives to a platelet transfusion?

Possible alternatives to platelet transfusion:

- Postpone any procedures or surgery that may require a platelet transfusion that are not urgent
- Can the procedure be changed to one with a low risk of bleeding e.g., from percutaneous to trans-jugular liver biopsy?
- Apply surface pressure after superficial procedures and correct surgical causes for bleeding
- Surgical patients expected to have at least a 500 ml blood loss (or >10% blood volume in children), use tranexamic acid (TXA) unless contraindicated
- Trauma patients who are bleeding or at risk of bleeding, early use of TXA
- Severe bleeding replace fibrinogen if plasma concentration less than 1.5 g/L
- Anti-platelet agents - discontinue or if urgent procedure/bleeding use TXA if risk/benefit would support
- Uraemia with bleeding or pre-procedure – dialyse, correct anaemia, consider desmopressin
- Inherited platelet function disorders - specialist haematology advice required. Consider desmopressin
- Chronic Bone Marrow Failure with bleeding – consider TXA

Indication for use of platelet transfusions in adults and children (RED ALERT)	Transfusion indicated (threshold)/ not indicated
Prophylactic use (No bleeding or WHO grade 1)	
• Any cause without additional risk factors for bleeding	**NOT INDICATED**
Prophylactic use in presence of risk factors for bleeding (e.g., sepsis, abnormalities of haemostasis)	
• Reversible or chronic bone marrow failure or critical care – consultant review required	10 to 20 x 10^9/L
• Abnormal platelet function, platelet consumption/destruction (e.g., TTP), immune thrombocytopenia	**NOT INDICATED**
Pre-procedure (Emergency or urgent procedures only)	
• Central venous catheter (CVC) tunnelled or untunnelled (excluding PICC line) • Lumbar puncture* • Percutaneous liver biopsy • Major surgery • Epidural anaesthesia, insertion & removal • Neurosurgery or ophthalmic surgery involving the posterior segment of the eye	20 x 10^9/L 40 x 10^9/L 50 x 10^9/L 50 x 10^9/L 80 x 10^9/L 100 x 10^9/L
• Bone marrow aspirate or trephine biopsies, PICC line insertion, traction removal of central venous catheters (CVCs), cataract surgery, other procedures with low risk of bleeding	**NOT INDICATED**
Therapeutic use (Bleeding WHO grade 2 or above)	
• Severe bleeding • Multiple trauma, brain or eye injury, spontaneous intracerebral haemorrhage • Bleeding (WHO grade >2) but not severe • Bleeding in specific clinical conditions – see table next page for indications	50 x 10^9/L 100 x 10^9/L 30 x 10^9/L

Indication for use of platelet transfusions in neonates (RED ALERT)	Transfusion threshold) / not indicated
Prophylactic use (No bleeding or WHO grade 1)	
• Neonate (including very pre-term) • Neonate with NAIT (no family history of ICH)	25 x 10^9/L 25 x 10^9/L
Prophylactic use in presence of risk factors for bleeding (e.g., sepsis)	
• Preterm neonate with sepsis • Neonate with NAIT (Family history of ICH)	25 x 10^9/L 50 x 10^9/L
Pre-procedure (Emergency or urgent procedures only)	
• Lumbar puncture* • Major surgery • Neurosurgery	40 x 10^9/l 100 x 10^9/l 100 x 10^9/l
• Procedures with low risk of bleeding	**NOT INDICATED**
Therapeutic use (Bleeding WHO grade 2 or above)	
• Severe bleeding	100 x 10^9/L
Specific clinical conditions	
Platelet function defect	
• *Congenital* – Pre-procedure or therapeutic use. When alternative therapy contraindicated or ineffective. Directed by specialist in haemostasis. • *Acquired* (anti-platelet agents, uraemia)- only indicated for severe bleeding	Count Variable
Disseminated intravascular bleeding	
• Pre-procedure or therapeutic use. Consider threshold counts above but may not be achievable and individual case review required	Use pre-procedure or therapeutic threshold as guide
Thrombotic thrombocytopenic purpura	
• Platelet transfusion contraindicated	unless life-*threatening bleeding*
Immune thrombocytopenia (excluding NAIT)	
• (ITP, HIT, PTP). Pre-procedure when other therapy ineffective or procedure urgent or to treat severe bleeding. Consider threshold counts above but may be unachievable or unnecessary and individual case review required	Use pre-procedure or therapeutic threshold as guide
Footnotes	
*It is accepted that prior to lumbar puncture some clinicians will transfuse platelets at higher counts (e.g., 50 x10^9 /L) in clinically unstable children, non-ALL patients, or for the first LP in newly-diagnosed ALL patients to avoid haemorrhage and cerebrospinal fluid contamination with blasts, or at lower counts (≤ 20 x 10^9 /L) in stable patients with ALL, depending on the clinical situation. These practices emphasise the importance of considering the clinical setting and patient factors.	
Abbreviations	
ALL acute lymphocytic leukaemia; BMF bone marrow failure; DIC Disseminated intravascular coagulation; HIT heparin-induced thrombocytopenia; ICH intracranial haemorrhage; ITP primary immune thrombocytopenia; LP lumbar puncture; NAIT neonatal alloimmune thrombocytopenia; PICC peripherally inserted central catheter; PTP post-transfusion purpura; TTP thrombotic thrombocytopenic purpura:	

References / Resources:

1. National Blood Transfusion Committee. A Plan for NHS Blood and Transplant and Hospitals to Address Red Cell Shortages. Original version August 2016 updated version March 2020, July 2022, February 2023.
   https://www.transfusionguidelines.org/uk-transfusion-committees/national-blood-transfusion-committee/responses-and-recommendations

2. DOH Circular HSC 1998/224 Better Blood Transfusion.
   https://www.transfusionguidelines.org/document-library/documents/hsc-1998-224-better-blood-transfusion

3. DOH. HSC 2002/009: Better Blood Transfusion – Appropriate use of blood.
   https://www.transfusionguidelines.org/document-library/documents/hsc-2002-009-better-blood-transfusion-appropriate-use-of-blood

4. DOH HSC 2007/001: 'Better Blood Transfusion' safe and appropriate use of blood.
   https://www.transfusionguidelines.org/document-library/documents/hsc-2007-001-better-blood-transfusion-safe-and-appropriate-use-of-blood

5. Patient Blood Management.
   https://hospital.blood.co.uk/patient-services/patient-blood-management/

6. BSH Guidelines for the use of platelet transfusions
   23 December 2016 Last Review Date: 14 January 2022
   https://b-s-h.org.uk/guidelines/guidelines/use-of-platelet-transfusions

7. Indications Codes for Transfusion:
   National Blood Transfusion Committee Recommendations & Responses (transfusionguidelines.org)

8. VANESA
   https://safe.nhsbt.nhs.uk/Vanesa/Account/Login?ReturnUrl=%2fvanesa

9. Blood Components APP
   https://www.bloodcomponents.org.uk/

10. Guidance on Reduced-Dose Apheresis Platelets
    https://nhsbtdbe.blob.core.windows.net/umbraco-assets-

corp/28872/nhsbt-information-for-laboratory-and-htt_reduced-dose-apheresis-platelets.pdf

11. SHOT reporting criteria.
https://www.shotuk.org/reporting/

April 2023: Updated on behalf of NBTC by Fatts Chowdhury
Reviewed by the following groups UK Red Alert Planning, NBTC EPWG, PBM Team, BSMS and the SHOT team.