

Reference Number: UHB 348
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Blood Component Transfusion Procedure

Introduction and Aim

Donated blood is an essential adjunct to health care but is also a limited resource. It is increasingly expensive, subject to public health concerns and can present a source of risk for patients. It is recommended that blood/component transfusion should be an integral part of care and clinical governance responsibilities in order to make transfusion safer. It is important to provide relevant information for patients relating to transfusion and avoid unnecessary use of blood/component in clinical practice ⁽¹⁾.

The aim of this procedure is to enable blood/components to be transfused safely, in particular to minimise the risk of giving blood/components of the wrong group to a patient in error and to avoid unnecessary transfusion in general. It is based on national multidisciplinary guidelines and informed by local experience. Red cells are the most commonly transfused blood component; however the principles described in the procedure apply to all blood components (e.g. platelets and plasma)⁽²⁾.

This procedure also seeks to ensure that transfusion activities within the UHB are compliant with Blood Safety and Quality Regulations⁽⁴⁾ as determined by the Medicines and Healthcare products Regulatory Agency (MHRA) who have been designated the competent authority to monitor compliance on behalf of the Department of Health (DOH).

This procedure supports the Blood Component Transfusion Policy and promotes safe and appropriate transfusion practice.

Objectives

The objectives of this policy are to provide a rational and practical framework on which to maximise patient safety during blood/component transfusion by:

- Assisting clinical staff to minimise avoidable risks of transfusions by providing clarity to the critical points of the process, namely pre-transfusion blood sampling, removal of blood components from blood fridges, transfer of blood components across clinical areas (including to satellite fridges) and administration of blood components. An understanding of the policy and procedure will provide the basis of knowledge required to comply with the National Patient Safety Agency (NPSA) (2006) Safer Practice Notice (SPN) 14 Right Patient Right Blood⁽³⁾.
- Managing, investigating and reporting adverse events and reactions.
- Encouraging clinical staff to consider the appropriateness of transfusion and to explore alternatives.
- Promoting safer transfusion as part of clinical governance responsibilities and highlighting Good Manufacturing Practice (GMP) and the organisation's regulatory responsibilities

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Scope The procedure applies to all UHB staff involved at any stage in the transfusion process and is applicable to both children and adults. A copy of the policy and procedure will be issued by the Blood Transfusion Laboratory Manager with the Technical Service Level Agreement(s) held between the UHB and relevant third parties.	
Equality and Health Impact Assessment	An Equality and Health Impact Assessment (EHIA) has been completed as part of the Blood Component Transfusion Policy and this found there to be a positive impact
Documents to read alongside this Procedure	Provision of Intra-Operative Cell Salvage Policy (UHB030) Blood and Platelet Shortage Planning Procedure (UHB285) Consent To Examination Or Treatment Policy (UHB100) Labelling of specimens submitted to Medical Laboratories Policy (UHB017) Parenteral Infusion Pumps Policy (UHB081) Waste Management Policy (UHB038)
Approved by	UHB Transfusion Group

Accountable Executive or Clinical Board Director	Medical Director
Author(s)	Dr A Goringe Consultant Haematologist
<u>Disclaimer</u> If the review date of this document has passed please ensure that the version you are using is the most up to date either by contacting the document author or the Governance Directorate .	

Summary of reviews/amendments			
Version Number	Date of Review Approved	Date Published	Summary of Amendments
1	21/02/2017	15/03/2017	From the previous revision of the Transfusion Policy the following have been included: 1 Updated the special requirement section following updated recommendations from SaBTO

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			<p>2 Updated the indications for platelet transfusion in line with updated BCSH guidelines</p> <p>3 Updated the Massive Haemorrhage Protocols in line with recent BSH guidelines and clinical collaboration</p> <p>4 Updated transfusion documentation</p>
2	09/10/2020	TBC	<p>Update in accordance with SaBTO recommendations, those born after 01/01/1996 may now receive both apheresis (single donor) and pooled platelets</p> <p>Update in accordance with SaBTO recommendations, those born after 01/01/1996 may receive FFP rather than Octoplas</p> <p>Competences for Pre transfusion sampling and Administration have been amended to be in line with All Wales strategy for competency assessment</p> <p>The use of O D positive blood for unknown male patients in massive haemorrhage</p> <p>Removal of internal Transport boxes</p> <p>Updated All Wales Transfusion Record</p> <p>E-Learning and Blood Component App added</p>
3	09/07/21	02/08/21	<p>Reflective of changes made to the Blood Transfusion Laboratory Computer System (LIMS) to be able to use the last 10 year history on patient for electronic issue (previously only had 6 months)</p> <p>Bring procedure in line with BSH compatibility guidelines irradiated guidelines</p> <p>Added Key words to be added onto request form</p>

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			<p>SHOT TACO checklist</p> <p>Sample acceptance criteria regarding confirmatory sample</p> <p>New All Wales Pre-Transfusion Sampling Request form and indication codes for transfusion</p> <p>New Traceability label preview</p>
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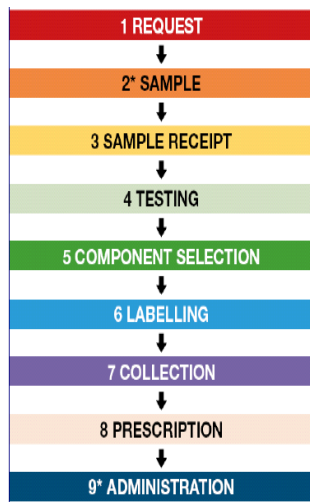
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Introduction

This procedure has been produced using the Serious Hazards of Transfusion [SHOT] guidance regarding the 9 steps of transfusion and where errors occur.



SHOT 2017 Report ⁽¹⁴⁾

ROLES AND RESPONSIBILITIES

In order to comply with the organisation's regulatory requirements, the Blood Transfusion Laboratory (BTL) must ensure that they have a robust Quality Management System (QMS). The organisation supports and promotes quality within the field of transfusion and the principles must be adhered to both in the BTL and clinical environments. This includes the reporting of incidents, accidents and near misses in relation to transfusion, the investigation of their cause and the implementation of corrective and preventative actions.

The UHB is ultimately responsible for ensuring that the health care professionals it employs are informed of, and have access to, UHB policies on blood transfusion. In addition, it is responsible for ensuring the BTL complies with the Blood Safety and Quality Regulations (BSQR) (SI 2005 No. 50 as amended) ⁽⁴⁾. Further specific responsibilities have been defined as:

Transfusion Group, in conjunction with the Hospital Transfusion Team (HTT), are responsible for:

Reviewing transfusion policies and procedures on a three yearly basis or as the law, National Regulations or Guidelines change.

- Promoting continuing education in transfusion medicine for all members of staff.

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- Reviewing the arrangements for providing continuing education and training of staff in transfusion policies and procedures and the law.
- Reviewing adverse transfusion events including “near misses”.
- Reviewing the appropriateness of blood/component transfusion, and making recommendations about the proper use of blood and blood components.
- Recommending corrective action in transfusion practice, where indicated.
- Promoting continuing education in transfusion medicine for all members of staff.
- Informing the UHB via the Quality and Safety Committee of the Transfusion Group activity by submission of an annual report or escalating individual issues as appropriate.

The Blood Transfusion Laboratory staff are responsible for:

- Ensuring the labelling of request forms and blood samples comply with local guidelines.
- Blood grouping and compatibility testing.
- Checking computer records for any special transfusion requirements when blood or blood components are requested.
- Cross checking against previous blood group and antibody status.
- Error reporting.
- Ensuring that blood and blood components are properly labelled, and the identification details of the patient and the blood component transfused are the same on the traceability label attached to the pack and the blood transfusion issue record.
- The investigation and reporting of transfusion reactions or other incidents related to transfusion ⁽¹⁷⁾.
- Ensuring adequate blood stock management and invoking the Blood and Platelet Shortage Planning Procedure when appropriate.

The Clinical Areas and Senior Nurses and Ward Managers are responsible for:

- Ensuring training in blood/component transfusion policies and procedures and law is included in induction programmes for new staff in the relevant areas.
- Ensuring all clinical staff involved in the blood/component transfusion process are aware of UHB transfusion policies and procedures, have undergone relevant training and are deemed competent to undertake the procedures in those areas of

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transfusion where they are authorised to practice and are able to evidence this under the PADR process.

- Ensuring adverse transfusion events including “near misses” are identified, documented, reported, investigated and appropriate action taken, this includes the timely implementation of CAPA.
- Ensuring all Traceability labels are returned within 48 hours of transfusion for all blood/components.

Clinical areas that house satellite fridges do so under a locally documented agreement managed by the BTL and compliance is mandatory.

The Medical staff/Non-Medical Authorisers of blood components are responsible for:

- Prescribing/authorising blood, blood components and blood products.
- Ensuring special requirements are requested appropriately
- Ensuring adequate documentation of blood/component transfusion in the medical notes.
- Ensuring that informed consent has been obtained.
- Where capacity to consent is in doubt, complying with the Mental Capacity Act 2005.

The Medical staff/appropriately trained registered Nurses and Midwives are responsible for:

- Requesting blood, blood components and blood products.
- Taking blood samples for compatibility testing.
- Explaining the risks and benefits of blood transfusion to patients, taking into account everyone’s individuality in accordance with their fundamental Human Rights 1998.
- Carrying out the procedure for the administration of blood and blood components.
- Monitoring patients during transfusion, and carrying out the appropriate actions in the event of adverse effects.
- Reporting of transfusion reactions or other incidents related to transfusion.

Unregistered nursing staff, e.g. student nurses and health care support workers, may be involved in the transfusion process under the close supervision of the Registered Nurse/Midwife. Unregistered staff cannot be involved in the pre-administration checking procedure or connection of the administration line to the patient’s cannula.

The Registered Nurse/Midwife remains responsible for ensuring transfusion policies and procedures are adhered to at all times.

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The Phlebotomists are responsible for:

- The collection of blood samples for compatibility testing, provided they are aware of UHB transfusion policies and procedures, have undergone relevant training and are deemed competent to do so.
- Ensuring that they only collect samples where there is a correctly completed transfusion request form and the patient can be correctly identified.
- Reporting to the nursing and medical staff responsible for the patient where these conditions are not satisfied.

The Portering staff are responsible for:

- The collection of blood, blood components and blood products, provided they are aware of the UHB transfusion policies and procedures.
- Have undergone the relevant training and they are deemed competent to carry out the collection procedures and complete the relevant documentation.

The UHB has a Transfusion Practitioner Team, their overall responsibilities are:

- To report to the Blood Transfusion Laboratory Management Team.
- To report to the Transfusion Group as defined in their terms of reference.
- To act as the UHB contact point for transfusion advice.
- To lead on education and audit appropriateness of blood usage.
- To support the clinical areas in identifying, training and educating a suitably experienced practitioner to represent the area and to be trained as an assessor in line with NPSA SPN 14⁽³⁾.

It is the responsibility of everyone involved in the blood transfusion process to report any adverse incidents, accidents or near-misses in accordance with regulatory requirements to SABRE and SHOT ⁽¹²⁾. The BTL will investigate all reported adverse incidents, accidents or near-misses related to transfusion. Incidents that are deemed as having patient or organisational risk will be reported in accordance with the UHB Incident Reporting Procedure via Datix. It is the responsibility of all Cardiff and Vale UHB employees to participate in/facilitate this process.

E-learning is available to facilitate staff knowledge and can be accessed via <https://www.learnbloodtransfusion.org.uk/>

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To set up a new registration:

https://nhs.learnprouk.com/lms/guest_level/TermsAndConditionsRegistration.aspx

To login if you are already registered:

https://nhs.learnprouk.com/lms/login.aspx?ReturnUrl=%2flms%2fuser_level%2fWelcome.aspx

Assistance to register can be sought from the Transfusion Practitioner Team on ext 44594 or 24360.

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REQUEST

When the decision to transfuse blood/component is made this should be clearly documented in the medical notes together with the reason for transfusion, including a note of the haemoglobin level or platelet count when this has been the trigger for transfusion⁽¹⁰⁾. (See appendix 1, 2 and 3 for indication for transfusion).

The patient should be provided with written documentation explaining their transfusion needs, as part of the informed consent procedure. Where capacity to consent is in doubt the Mental Capacity Act 2005 and its Code of Practice must be followed. There are specific consent forms available for Jehovah's Witness patients or patients who decline transfusions, which should be utilised early on in the patients care. If the transfusion is for a child then the child's parents/carers' should be given the relevant information.

A suitably trained doctor, nurse, midwife, should complete the request form and at the same time a Doctor or non-medical authoriser of blood components must authorise the blood/ components on the All Wales Transfusion Record. The request form should specify quantity and any special transfusion requirements (e.g. Irradiated, CMV negative, – see appendix). Any special transfusion requirements **must** be communicated to the BTL (appendix). Key words are also in the appendix. The organisation endorses the completion of the request form prior to the collection of the pre-transfusion sample for blood group and antibody screen and/or compatibility testing as per National Guidelines. This form must be used as part of the **positive patient identification** check in the pre-transfusion sampling procedure.

The request form must be complete and legible, failure to comply with these standards will result in the sample being rejected and a new sample requested. The information required, see below, is in accordance with guidelines published by the BSH (2012)⁽⁵⁾ which do not require information regarding the patient's ethnicity, disability, origin or religion. Addressograph labels are acceptable on request forms but caution must be taken to ensure they belong to the correct patient. There is advice on how to complete the request form in the appendices

The first part of the request form **MUST** contain the following details:

- First name
- Last name
- First line of address
- Date of birth
- Hospital/NHS number
- Name and signature of requesting doctor/nominated deputy

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Other fields to be completed on the form in line with best practice:

- Gender
- Location (e.g. ward)
- Consultant
- Date that the blood sample was requested
- Ext/Bleep number of the requesting doctor
- Reason for transfusion/relevant transfusion history
- Number and type of blood components required (if any)
- The date and time that blood components are required

Positive patient identification is essential and the person taking the pre-transfusion sample is responsible for the completion of the declaration part of the request form. The signature on this part of the form and on the sample confirms that the person signing has followed the correct procedure and they accept responsibility that the sample was taken from the patient identified on the request form. The person taking the sample must print their name, add a signature, and indicate the date and time the sample was taken. If any of these details are missing, the sample is not suitable for processing and must result in rejection and a new sample requested. Please note: the declaration does not need to be filled in when a form is sent for subsequent requesting of components as no sample is taken.

The request form can be used in two ways:

- used to order blood/components and sent with the patient's blood specimen to the BTL or
- used to request a blood group and antibody screen test (sent with patient's blood specimen) where there may be a future requirement for blood/components.

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Pre - Transfusion Sample

An appropriately trained doctor, nurse, midwife, phlebotomist or health care support worker should draw the pre-transfusion blood sample. The NPSA recommends that all staff are trained and competency assessed in pre-transfusion sampling procedures. The organisation requires that these competency assessments are completed and evidenced during individuals PADRs. It is the individuals' responsibility to ensure they are competent to undertake this task. **Positive Patient Identification** of the patient is essential. Patients must be asked to state their name, date of birth and first line of address before the sample is drawn. Those details, and the hospital number, must be checked against the patient wristband and request form^(6, 7). If there are any discrepancies or the patient does not have a wristband (with the exception of out-patient areas), do not proceed until the issue is resolved. It is acknowledged that in certain extreme emergency situations this may not be possible, for example, newborn babies being transfused as part of resuscitation procedures. However, due regard must be applied to positive patient identification in all circumstances.

Extra care must be taken when drawing blood samples from patients unable to participate in a verbal identification check, i.e. children, confused patients, unconscious patients or anyone with any disability that prevents them from verbally identifying themselves. In these circumstances, in addition to checking the wrist band the patient's identity can be checked, where possible, with a third party at the bedside i.e. a relative, friend or colleague. This positive identification is then recorded on the request form by the person collecting the sample by completing the declaration section of the request form.

The label on the blood sample tube must be hand written legibly, using a ball point pen by the person who took the blood immediately after it is taken, beside the patient. Labelling for each patient should be completed before the next patient is bled. Sample labels must never be filled in before the specimen is drawn, as this is a leading cause of transfusion incidents. Addressograph labels are not acceptable on sample labels. Take care to ensure that the details on the sample correspond exactly with the details on the request form as any discrepant forms and samples will be rejected by the BTL. This could result in delay in provision of components and in patients being re-bled unnecessarily.

The UHB accepts that there may be clinical situations where it may be difficult for the person taking the sample to label the sample, e.g. femoral stab. In these situations it is the responsibility of the person labelling the sample to ensure they have positively identified the patient and to sign the request form and sample.

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The sample label must include the following information:

First name	Date of birth
Last name	Hospital number (NHS Number)
Gender	Location (e.g. Ward)
First line of address	Signature of person taking blood (must be legible)

The person taking the sample must complete the declaration section on the request form, completing the date and time the sample was taken, and by printing, signing and adding their contact details to the form.

The signature on the sample tube and the signature of the person confirming positive patient identification has been completed must match for the sample to be accepted.

For unknown patients (e.g. In Unscheduled Care), the request form must contain the following details

Gender	Number and type of blood components
Hospital Number	When blood components required
Location (e.g. Ward)	Diagnosis and reason for request
Name, signature and bleep number of requesting Healthcare professional	Special Requirements if appropriate

For unknown patients, the following must be present on the sample label:

Hospital number
Gender
Location (e.g. Ward)
Signature of person taking the blood

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Timing of sample collection in relation to previous transfusions:

If stored at 4°C, EDTA whole blood samples may be used for compatibility testing for up to 7 days.

The timing of sample collection for compatibility tests must take account of previous transfusions and pregnancies.

Transfusion or pregnancy may cause a primary or secondary immune response and samples selected for cross matching or antibody screening must take account of this, so that newly developed antibodies are detected.

When a patient is being repeatedly transfused, it is not necessary to submit a daily cross match sample. Such patients should be screened for the development of irregular antibodies every 72 hours.

If a transfusion has been given more than 72 hours previously, a new sample is required according to the following guidance:

<u>Patient transfused or pregnant:</u>	<u>Sample to be taken up to:</u>
Within last 3 months	48 Hours before transfusion (with a 24 hour reservation period)
Greater than 3 months	7 days before transfusion

In pregnant women – immunisation is more likely to occur during the third trimester of pregnancy. It is advisable that a sample is taken immediately before transfusion or upon admission for an elective procedure.

Requirement for confirmatory sample and the taking of duplicate samples

In line with current BSH guidelines Cardiff and Vale University Health Board (UHB) requires a confirmatory sample to be taken.

If the patient has a blood group on record in the Laboratory information system (LIMS) for ABO/Rh and antibody screen within the last 10 years, this will be used as the patient historical record. Therefore, when a known patient requires blood products, clinical staff are required to take **one** current sample.

If the patient is **not known** to Blood transfusion laboratory (BTL) then an additional confirmatory sample will be required.

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- The confirmatory sample must come from **separate** venepuncture events and ideally should be carried out by two different people.
- If the same person carries out the two samples they must be taken more than **two hours** apart. If this is not possible due to clinical urgency contact the BTL for advice.
- If the samples are urgent and are taken by the same person, the confirmatory sample will be held by the BTL until confirmation that the confirmatory sample was taken independently.
- Separate request forms must be completed for each sample. **Both samples must be drawn independently at least two hours apart.**
- In an emergency, if blood is required e.g. massive haemorrhage, blood group O D negative or O D positive will be issued, so not to cause any delay to the patient. However, a confirmatory sample should be sent as soon as possible, enabling the BTL to change to group specific.

If you are unsure if Blood transfusion Laboratory already have a historic blood group you can check on the electronic patient records for a BBS sample within the last 10 years. If you are still unsure then please telephone Blood Transfusion Laboratory 42157 (UHW), or 25389 (UHL) to avoid unnecessary testing of patient samples. Duplicate samples will not be tested and a free text will be added onto clinical portal to advise the clinical team that the sample will not be processed.

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Sample Receipt

In line with the Clinical Advisory Group of the Welsh Government's Guidelines the UHB has introduced a Zero Tolerance Policy on the acceptance of pre-transfusion blood samples in April 2011. This means that any inaccuracies on either the sample request form or the sample bottle will lead to the sample being discarded and the patient being re-bled. Once the sample and form have left the clinical area there will be no opportunity to amend form or sample. See appendix – sample acceptance zero tolerance.

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Testing

Historically blood has been issued only after serological compatibility testing, a process where the patient's plasma is tested directly against a sample of the red cells from the donor unit. Currently this process has a routine turnaround time of two hours and the compatible units are reserved for an individual patient for up to 48 hours.

With the introduction of automation to the BTL it is now possible to issue selected units without serological compatibility testing i.e. electronic issue or EI.

Patients are eligible for Electronic Issue (EI) provided the following criteria are met:

- The ABO and RhD blood group results on the current sample and any historical record must be identical.
- The ABO and RhD results of the current sample are authorised.
- A record must exist of 2 fully automated ABO/RhD groups and antibody screens where results have been transferred electronically (and are unedited). A minimum of one historical record (within the last 10 years) and the current sample.
- There is no outstanding antibody screen registered for the patient.
- The patient's plasma **does not contain and has not been known to contain**, clinically significant alloantibodies reactive at 37°C.
- The antibody screen on the current sample is negative.

Patients not eligible for EI will have serological compatibility testing performed on receipt of the initial request and blood will be reserved appropriately for that patient.

In emergency situations it is essential that the BTL is contacted immediately to ensure that blood is available for collection at the agreed appropriate time.

It is a clinical decision to transfuse blood components when the patient is not eligible for EI and there has been insufficient time to complete full compatibility testing as this may result in adverse events (immediate or delayed transfusion reactions) as the patient may have unidentified antibodies or develop significant antibodies [e.g. maternal sensitisation to rhesus antigens].

O D Negative / O D Positive units

A stock of O D Negative and O D positive blood for emergency use is maintained by the BTL at UHW and UHL. This must only be used when delay in transfusion will jeopardise the patient's life.

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ABO and D group specific uncrossmatched units

On receipt of a valid sample blood can be issued which is ABO and D group specific uncrossmatched within 15 minutes, as long as blood group is known historically. This preserves the stock of O D negative blood.

Fully compatible (cross matched) units

The patient is required to have an historical sample and a current valid sample to comply with the BSH guidelines in order to issue blood components. The BTL must be informed by the clinical area of the urgency.

Patients with atypical antibodies

The patient's plasma is screened to identify any atypical red cell antibodies of potential clinical significance. These usually occur after sensitising events and are directed against other blood group antigens (e.g. Kell, Duffy, Kidd) on the surface of red cells. If such antibodies are identified every effort is made to provide blood which is negative for the corresponding antigen to avoid the risk of haemolytic transfusion reactions. This is a time consuming process and will delay the provision of blood. If a patient should need blood urgently the Consultant Haematologist can advise on the severity of risk if blood is given that is not fully compatible. This risk must be balanced with the risk of delaying transfusion.

The BTL must be informed of any changes to the patient's clinical condition that may be significant to their transfusion requirements.

Platelets may be issued immediately on a confirmed blood group but it should be noted that the availability of this resource is limited and they may need to be ordered from the WBS.

Pre thawed Fresh Frozen plasma (FFP) is available within the UHB. However it must be noted if additional is required it takes 20 minutes to thaw.

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Component Selection

See appendix for guidance on component selection including special requirements.

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Labeling of blood components

All blood components have a traceability label attached giving patient details. The bag label contains a tear-off section that must be returned to the BTL to ensure compliance with the legal traceability requirements of the BSQR confirming that the component has been transfused. Additionally, an adhesive strip containing the required information for recording the transfusion is supplied on the traceability label which must be adhered to the All Wales Blood Transfusion Record.

Bag identifier – label on blood/component bag bearing blood group of donor, 14 digit unique donation numbers should match the donation numbers on the traceability label. The expiry date and additional information such as CMV negative/irradiated/ should also be checked.

It should be noted that laboratory documentation related to transfusion episodes is scanned and retained for a period of up to 30 years or longer to allow a full audit trail of donations from donor to patient.

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COLLECTION AND DELIVERY OF BLOOD/BLOOD COMPONENTS

The blood/component should not be collected until the blood/component has been prescribed/authorised and the required equipment is available. The blood/component must be prescribed on the All Wales Transfusion Record and any associated medication prescribed on the All Wales inpatient medication chart. The patient must have patent intravenous access. The baseline observations must be undertaken. These are temperature, pulse, blood pressure and respiratory rate as a minimum and they must be recorded on the All Wales Transfusion Record within an hour of the transfusion starting. In addition, the overall patient's condition should be noted so significant clinical changes can be detected.

Care should be taken with regard to the timing of transfusions, e.g. are there sufficient staff to undertake the appropriate supervision and appropriately timed for patient needs. Transfusion at night should be avoided unless the patient is symptomatic.

A member of staff from the appropriate clinical area should complete a collection slip or enter details onto portertrac within UHW with the patient identification information listed below. Addressograph labels are acceptable on collection slips. Staff must indicate the component or product type to be collected and quantity. Abbreviations must be avoided.

- First name
- Last name
- Gender
- First line of address
- Date of Birth
- Hospital number (NHS Number)
- Location (e.g. Ward)
- Signature of member of staff requesting blood/component

The person retrieving the blood/component should take the collection slip from the ward or print out from portertrac to the BTL. The details on the collection slip/print out, the traceability label and the bag identifier must be checked against the BTL Issue Record when the component is collected. The BTL Issue Record must be signed, dated and timed when blood/components are removed.

Portertrac/ Symbiotic

Portertrac is the system used within UHW for requesting a porter to collect blood components and in UHL Symbiotic is used.

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Units of blood should be removed from the issue fridge in the BTL or satellite fridge individually, as they are required. All blood components must be carried in a plastic blood carrier bag to ensure the patient's details remain confidential throughout the transportation process. This also enables minimal handling. Blood taken in a bag must be returned within 30 minutes of removal from the fridge for it to be returned to stock. If blood is not returned within 30 minutes it will be disposed of.

If the clinical area does not have a satellite fridge, the BTL should be contacted if the clinical area requires more than one unit of red cells.

No blood component should be stored in a ward drugs fridge

Any member of staff who undertakes blood/component collection from the BTL or satellite fridge must be trained to do so to comply with the legislation. In addition, staff who undertake collection of blood/components must be trained and competency assessed in line with the NPSA SPN 14⁽³⁾.

Collecting blood in an emergency is discussed in appendix.

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Prescription/Authorisation

The All Wales Transfusion Record – includes a pre administration checklist, prescription section and observation chart. Any special transfusion requirements (e.g. irradiation of blood/component or cytomegalovirus (CMV) negative or must be indicated on the prescription section of the record and special requirements are discussed in appendix. Any transfusion-related drugs must be prescribed on the All Wales in-patient medication chart.

Blood components can only be prescribed/authorised on The All Wales Transfusion Record by Doctors and staff who have successfully undertaken the non-medical authorisation of blood component course.

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Administration

Pre-Administration Checklist

As detailed on the All Wales Transfusion Record pre administration checks must be completed prior to the commencement of the blood component. All checks should be undertaken for each unit at the time of administration. The temperature, pulse, blood pressure and respiratory rate as a minimum should be recorded on the All Wales Transfusion Record before each unit of blood is requested to be collected.

- The patient's details, pre-authorisation checklist and authorisation are fully completed and correct
- Check for concomitant medication (if indicated) and administer as prescribed on the All Wales Drug Chart
- Patient identifiers on the component compatibility label match the patient details on the All Wales Transfusion Record
- Component is correct (i.e.. red cells, platelets, FFP)
- Special requirements (irradiated, CMV Negative, HLA Matched) are met where indicated
- Component has not passed expiry date/time (midnight of date shown on front of bag)
- The blood bag should be gently agitated and inspected for leakage, haemolysis, discolouration and large blood clots before administration. Any suspect bags must be returned to the BTL.
- Patient blood group on the compatibility label is identical to, or compatible with, the blood group on the front of the bag; if unsure of compatibility contact blood bank for confirmation
- Unique donation number on the compatibility label is identical to the donation number on front of bag

One appropriately trained member of staff, who may be a doctor, first or second level RN, RSCN, RMN or an ODP, is responsible for checking each unit of blood/component before administration. If local policy advocates a double person checking procedure for blood components it must be performed as a double independent check.

The transfusion should take place in a clinical area where the patient can be closely observed by clinical staff. Care should be taken with regard to the timing of transfusions, taking into consideration patient's individual needs and requirements.

Routine, non-urgent transfusion activity should be avoided out of hours. Evidence from Serious Hazards of Transfusion (SHOT)⁽¹⁵⁾ indicates that this is when transfusion errors are most likely to occur. Decisions to transfuse out of hours should be based on an individual patient risk assessment and

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documented accordingly in the medical records. Naturally, patients who require transfusion in an emergency situation out of hours must be transfused appropriately according to their clinical need.

Administration

Bed side Checks

Positive Patient Identification [PPI] is essential. Patients must be asked to state their name, date of birth and first line of address. The patient identification details, and the hospital number, must be checked against the patient wristband, traceability label and All Wales Transfusion Record. If there are any discrepancies, or the patient does not have a wrist band, do not proceed until the issue is resolved. Extra care must be taken when administering blood/components to patients unable to participate in verbal identification check, i.e. children, confused patients, unconscious patients. In these circumstances, in addition to checking the wrist band the patients identity should be checked, where possible, with a third party at the bedside i.e. a relative, friend or colleague.

The bedside check must occur at the patient's bedside. The NPSA SPN 14⁽³⁾ recommends that all staff are trained and competency assessed in the administration of blood components. The organisation requires that these competency assessments are evidenced under PADR's.

The following details must be checked and found to be identical on the patient wristband, traceability label and the All Wales Blood Transfusion Record:

First name	Date of Birth
Last name	Hospital Number (NHS number)
First line of address	

The blood unit number (14 digit unique donation number) must be checked and found to be identical on the bag identifier and bag label. Care should be taken if using paediatric RBC or apheresis platelets as there may be multiple packs with the same unit number as they are sourced from the same donor. The packs are differentiated by the 'pack' number.

The blood transfusion should be commenced as soon as possible after removal from the BTL issue/satellite fridge (not exceeding 30 minutes). Blood must never be stored on the clinical area, especially in ward fridges. Blood may only be stored in a clinical area if it has a designated blood satellite fridge.

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In certain circumstances, blood that has been out of a temperature controlled environment for more than 30 minutes but is still intended to be transfused can be administered as long as the transfusion is complete within 4 hours of the blood leaving controlled refrigeration, i.e. removal from the BTL issue/satellite fridge/blood. Staff must be certain that the blood has been stored appropriately in the meantime and at suitable temperatures (i.e. it must not have been artificially cooled or warmed). If the transfusion is in progress at 4 hours it must be immediately stopped and discarded.

Blood / components should be transfused through a designated sterile blood giving set. It should not be left to 'warm up'. Blood components are now leucodepleted at source, and there is no need for the use of an additional leucodepletion filter. There is no requirement to prime the giving set with an alternative fluid or to flush the giving set post-transfusion.

At the start of the transfusion the patient should be asked to report any symptoms of fever, rigor, rash, flushing, and shortness of breath or pains in the loin or the extremities. Other signs and symptoms of transfusion reaction may also occur (see appendix). Staff should be mindful of communication issues and understanding if English is not the patient's first language.

It is strongly advised, that where possible, only one blood/component is transfused at any given time, however depending on the clinical situation it may be necessary for patients that have multiple intravenous access, e.g. a double lumen line, to enable multiple blood/components to be transfused at the same time. Care must be taken, as if the patient had a transfusion reaction it would be difficult to ascertain the contributing blood/component.

Drugs must never be added to blood. Dextrose solution (5%) can cause haemolysis and solutions containing calcium may cause clotting of citrated blood.

If the transfusion is required to be temporarily stopped, the giving set should be closed off and the intravenous access suitably flushed to avoid any clot formation. On restarting the transfusion the intravenous access site and giving set line must be observed to ensure that there are no clots and the line is fully patent.

Electronic pumps may damage red cells and should only be used if verified as safe for this purpose by the manufacturer, and the user is trained and competency assessed in line with the UHB Infusion Pumps Policy. The sterile giving set should be compatible with the pump, as defined by the manufacturer.

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Giving sets previously used for blood should not be used to administer platelets. Platelets should be administered via a platelet giving set or a standard blood giving set. The giving sets must be changed between each unit of platelets.

The giving set should be changed every 12 hours during transfusion of red blood cells or after two units. If there is a significant delay in between units being transfused, it is advisable to change the giving set. Change the giving set if there is a change in the group of transfused blood (e.g. from group O to group specific in an emergency) and dispose of it at the end of the transfusion episode.

The warming of blood and blood components is generally not recommended as it is of limited benefit and can be dangerous. If indicated, blood warmers must always be used and maintained according to the manufacturer's guidelines. All devices should be CE serviced as per hospital Health and Safety and Clinical Engineering policies, Medicines and Healthcare Products Regulatory Agency (MHRA) and manufacturers' guidelines.

Blood warmers are only indicated when:

- a) Massive, rapid transfusion could result in cooling of cardiac tissue, causing potentially fatal dysrhythmia. If the rate of transfusion is greater than 100 mL per minute blood warming devices should be used.
- b) Transfusion is required by patients with cold agglutination disease.
- c) Exchange transfusion is indicated in the newborn.
- d) Designated blood warmers should be used at flow rates of > 50 mL/kg/hour in adults (15 mL/kg/hour in children); for exchange transfusion in infants and for patients with cold agglutinins.

Blood should be transfused at a rate determined by clinical circumstances. This may be as quickly as possible in a case of trauma, but is usually at a rate of one unit every 2 – 3 hours in adults, with diuretic cover where necessary. Transfusion of red cells **must** be completed within 4 hours of the component leaving controlled refrigeration.

Platelets and FFP should be transfused over a 30 minute period.

The temperature, pulse, blood pressure and respiratory rate as a minimum should be recorded on the All Wales Transfusion Record before each unit of blood is transfused, fifteen minutes after the start of the transfusion of each unit, and at the end of transfusion of each unit. Further transfusion observations are

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only required if the patient is unwell or has a reaction and should be based on an individual patient assessment.

Particular care should be taken in monitoring unconscious patients, particularly during the first fifteen minutes of the transfusion.

The person checking the blood should enter the time and date the transfusion commenced on the All Wales Blood Transfusion Record and sign that they have administered it. The 14 digit unique donation number must be entered on the All Wales Blood Transfusion Record. An adhesive strip containing this number is provided on the bag label for convenience.

Used blood/component bags and giving sets can be discarded, provided the patient is well, at the end of the transfusion in accordance with UHB Waste Management Policy. It is not necessary to return the blood bag to the BTL unless a reaction has occurred.

For further information of the safe administration and use of Immunoglobulin, advice can be sought from the Advanced Nurse Practitioner – Immunology and Allergy on (029) 2184 8380.

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Traceability

If for any reason the blood/component or any blood product is not transfused it must be returned to the BTL immediately to ensure compliance with legislation. Any unused blood/component that has been out of the BTL a temperature controlled environment in excess of 30 minutes must be brought to the attention of the BTL staff, whether routine or out of hours. The blood must be returned as soon as possible to the BTL to be discarded as it is unsuitable for restocking into the BTL fridges. Blood left on the ward without being transfused for long periods is at risk of being administered to the patient by accident.

A component is considered transfused even if a patient receives only a few millilitres of the transfusion.

If a component is pierced with a giving set but nothing is transfused to the patient, that is the primed line has not been attached to the patient's intravenous access, the component must be disposed of with the giving set safely in the clinical area. In these circumstances it is inappropriate on health and safety grounds due to the risk of a needlestick injury, to return the non-transfused component to the BTL. However, the BTL staff must be informed that the component has not been transfused so it can be marked as disposed. This can be indicated on the returned traceability label.

The BTL must receive positive confirmation that a component has been transfused to ensure compliance with the legislation. A system of return of the traceability label to the BTL has been implemented to meet this statutory requirement of the BSQR (SI 2005 No. 50 as amended)⁽⁴⁾. Ensuring that all blood and blood components are traceable from donor to recipient and that traceability records are maintained for a minimum of 30 years is a requirement of the legislation. It is the responsibility of clinical staff to return the labels to the BTL within 48 hours of completion of the transfusion and if the label is not returned alternative evidence will be accepted (either a copy of the All Wales Transfusion Record or Anaesthetic chart with the appropriate affixed sticker attached). This affects all blood components (e.g. red cells; fresh frozen plasma; platelets; cryoprecipitate). It is recommended for all other blood products (e.g. Anti-D; Prothrombin Concentrate Complex (PCC); albumin, immunoglobulin). Adverse incidents will be raised via the Clinical Governance department if the clinical area fails to return the traceability labels to the BTL, additionally repeated non-compliance will be escalated through the organisational structure.

Occasionally, a patient may be admitted with blood components that have been prepared for transfusion at another hospital. In this circumstance, blood received with the patient from elsewhere must be sent to the BTL in the

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receiving hospital prior to being re-issued for transfusion. Caution must be taken when the patient and/or blood components have been subject to an inter-hospital transfer as hospital identification numbers may have changed. The BTL will ensure cold chain requirements are maintained and log the transferred blood/components into the Laboratory IT system to ensure full traceability.

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Appendix 1: INDICATIONS FOR RED CELL TRANSFUSION

The main indications for red cell transfusions are bone-marrow failure, transfusion programs for chronic diseases and surgical indications for acute or perioperative blood loss, either measured or estimated, or acute blood loss due to trauma. There is increasing evidence that a conservative policy of perioperative red cell transfusion does *not* compromise clinical outcome, and some evidence that it may improve outcome in certain circumstances. The following recommendations are based on guidelines published by the British Committee for Standards in Haematology (BSH)⁽²⁾, which are reviewed by the Royal College of Surgeons of England, the Royal College of Physicians and the Royal College of Anaesthetists, and are the **suggested** standards for audit locally.

Acute or perioperative blood loss where the decision to transfuse is based on an estimate of circulating volume lost:

- Blood loss should be treated with crystalloid infusion initially
- For blood loss of <15% of circulating volume blood transfusion is not generally indicated.
- Blood loss of 15–30% of circulating volume is not an automatic indication for transfusion of red cells, unless the patient was previously anaemic, or unless there is cardiopulmonary compromise.
- Blood loss of >30% of circulating volume generally requires the transfusion of red cells.

Acute or perioperative blood loss where the decision to transfuse is based on the measured haemoglobin IN ADULTS:

- When the haemoglobin is >100g/L blood transfusion is not generally indicated.
- When the haemoglobin is 70–100g/L blood transfusion may be indicated, but the decision to transfuse should not be based on the measured haemoglobin alone.
- When the haemoglobin is <70g/L (or 80g/L in patients with cardiopulmonary compromise) transfusion of red cells is generally indicated, however consideration should be given to all clinical signs and symptoms.

Consideration should be given regarding the quantity of blood given to obtain the required transfusion targets and improve patient symptoms – this may involve single unit transfusion. The checking of Hb levels prior to subsequent unit transfusions is encouraged.

Patients on transfusion programs and patients with bone marrow failure:

- A clinical team experienced in their care should manage these patients.
- The transfusion threshold should be determined by an assessment of the patient's symptoms of fatigue in the absence of clinical indicators.

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- Alternatives to red cell transfusion (e.g. Iron, Erythropoietin) should be considered where appropriate.

The table below indicates the red cell compatibility.

Red cell compatibility

Patient Donor	A	B	AB	O
A	√	X	√	X
B	X	√	√	X
AB	X	X	√	X
O	√	√	√	√

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Appendix 2: THE USE AND ADMINISTRATION OF PLATELETS

The following recommendations are based on the guidelines published by the BSH (2016) ⁽¹⁰⁾.

Risk / Monitoring

There are risks associated with platelet transfusions. The decision to transfuse should include an assessment of risk versus benefit. The risks include:

- Alloimmunization
- Allergic reactions
- Transfusion-related acute lung injury
- Transmission of infection
- As platelets are stored at room temperature they are more often implicated in adverse events due to bacterial contamination than other blood components

The patient should be informed of possible complications of transfusion.

Administration

Only staff members who have passed NPSA competency assessment for the administration of blood components.

A confirmed blood group is required to issue platelets.

The same procedure should be undertaken as described in the administration of blood. The nurse or doctor should ensure that the details on the platelet pack traceability label correlate with those on the patient's wrist band and the All Wales Blood Transfusion Record. Utilisation of the pre-administration check list on the All Wales Transfusion Record is essential. The bag should be inspected for any discolouration. Platelets may appear to be tinged 'green'. This is usually due to the donor taking the oral contraceptive or hormone replacement therapy. If there are any concerns please contact the BTL.

Platelets must be administered through a platelet giving set or a standard blood giving set. The platelet giving set must be changed between each unit of platelets. Platelets must not be transfused through giving sets that have been used for blood.

Platelets must be transfused as soon as possible after reaching the clinical area and should be administered within 30 minutes.

Platelets must not be refrigerated or stored for any time in the clinical area.

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Monitoring follows the same baseline, 15 minute and post transfusion observation checks as for red cell transfusions.

Indications

Platelets are indicated for the prevention and treatment of haemorrhage in patients with thrombocytopenia or platelet function defects. Platelets are not indicated in all cases of thrombocytopenia and may indeed be contraindicated in certain conditions. Broad indications for transfusion of *adults* are given in the table below. Please refer to specific local guidelines where available.

Prophylaxis	
Platelet Count x10⁹ litre⁻¹	Transfuse
Less than 10	Routinely
Less than 20	Temp >38°C Minor bleeding Mucocutaneous haematomas Insertion of venous central lines by experienced staff using ultrasound guidance
Less than 40	Lumber puncture
Less than 50	Coagulation disorder Patient anticoagulated Percutaneous Liver Biopsy Major procedure Massive transfusion
Less than 80	Insertion/removal of epidural catheter
Less than 100	Neuro or spinal cord surgery
	Active Bleeding
Less than 50	Severe bleeding
Less than 100	Multiple Trauma/Traumatic Brain Injury Spontaneous Intracranial Haemorrhage Major Obstetric Haemorrhage
Platelet dysfunction	Invasive procedures, following discussion with senior coagulation haematologist dysfunction

The most common cause of platelet dysfunction is acquired secondary to patient medication including the use of Aspirin and Clopidogrel. These both have prolonged effects on platelet function. The action of Clopidogrel is not readily reversed by platelet transfusion.

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Selection of Platelet Products

Platelet concentrates are prepared from either whole blood donations (a pool of 4 donors), or by plateletpheresis (single donor). Platelets are leucodepleted at source by filtration or centrifugation/elutriation.

- Volume 150-300mL for apheresis platelets
 150-450mL for pooled platelets
- Platelets count $>240 \times 10^9$ per adult dose

Storage/Shelf life – 5 - 7 days stored at room temperature with continual gentle agitation.

The shelf life and requirements for standard microbiological testing prior to release may cause temporary shortages especially following holiday periods.

ABO compatibility

Platelets of the same ABO group as the patient are the components of choice. Best practice would indicate group O products are not selected for non-group O patients.

ABO non identical transfusions may result in poorer platelet increments but this has not been shown to be clinically significant and such transfusions are acceptable.

Group O platelets must be labelled as negative for high titre anti-A and anti-B antibodies if given to group A, B and AB patients this should be given if there is no suitable alternative.

Mismatched platelet transfusions may lead to low level haemolysis.

D compatibility

There are no D antigens on platelets; however there is a small amount of red cell contamination in platelet components. Therefore some precautionary measures are required.

D negative platelet components should be administered where possible to D negative patients.

If D positive platelets are administered to D negative women of childbearing potential, then anti-D prophylaxis should be administered. A dose of 500 iµ anti-

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D given subcutaneously in a thrombocytopenic patient should cover up to 5 platelet transfusions over a 6 week period.

Special transfusion requirements

Please see appendix on special transfusion requirements regarding CMV status/ component.

All platelets supplied by the Welsh Blood Service (WBS) are irradiated at source and can be given to patients at risk of Transfusion Associated Graft versus Host disease (TA-GVHD).

Human Leucocyte Antigen (HLA) matched platelets may be required in cases of platelet refractoriness secondary to HLA antibodies. Such cases should be guided by specialist haematological advice. Due to the specialist nature and limited resource issues surrounding the provision of HLA platelets the requesting clinician must agree to provide regular platelet increments post transfusion to the Transfusion Service to ensure optimised patient and donor care.

Platelet Compatibilities

	Choice of ABO Donor Group		
	First Choice Platelets	Second Choice Platelets	Third Choice Platelets
O Recipient	O	A or B	
A Recipient	A	B	O
B Recipient	B	A	O
AB Recipient	AB	A or B	O

Neonatal platelet packs will always be CMV negative and irradiated but will only be provided group O or A D negative as available from WBS.

In accordance with SaBTO recommendations those patients born after 01/01/1996 may now receive both apheresis (single donor) and pooled platelets^(10,13).

Platelets with neonatal specification and HLA/HPA selected platelets will remain apheresis derived.

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Appendix 3: THE USE AND ADMINISTRATION OF FRESH FROZEN PLASMA (FFP)

The following recommendations are based on the guidelines published by the BSH, 2018⁽¹¹⁾.

Plasma components (fresh frozen plasma (FFP) and cryoprecipitate (cryo)). The SaBTO recommendations mean that it is no longer necessary for those born after 1st January 1996 to receive pathogen reduced FFP. This will effectively remove the current distinction for selection of plasma components⁽¹³⁾.

Risk / Monitoring

There are risks associated with FFP transfusions. The decision to transfuse should include an assessment of risk versus benefit.

The risks include:

- Fluid overload
- Allergic reactions and anaphylaxis
- FFP contains a large volume of plasma proteins. Allergy resulting in urticaria has been reported in 1-3% of transfusions, whilst anaphylaxis is rare.
- Patients who are IgA deficient are at increased risk of anaphylaxis. In patients who have proven IgA sensitivity specialist advice must be obtained.
- Transfusion related acute lung injury (TRALI) - TRALI is associated with the presence of leucocyte alloantibodies in donor plasma. TRALI presents clinically as severe respiratory distress with hypoxia, pulmonary oedema similar to adult respiratory distress syndrome (see transfusion reactions for more details)
- Transmission of infection
- Haemolysis due to transfused antibodies

Administration

Only staff members who have passed NPSA competency assessment for the administration of blood components should administer FFP.

A confirmed blood group is required to issue FFP.

The same procedure should be undertaken as described in the administration of blood. The nurse or doctor should ensure that the details on the FFP traceability label correlate with those on the patient's wrist band and the All

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Wales Blood Transfusion Record. The bag should be inspected for any discolouration.

FFP should be transfused as quickly as the patient's condition permits at a rate prescribed by the attending doctor. For maximum benefit this should not exceed 1-2 hours after thawing. If unused it must be returned to the BTL.

Monitoring follows the same baseline, 15 minute and post transfusion observation checks as for red cell transfusions.

Indications

FFP is required for:

- Replacement of single factor deficiencies when a suitable specific or combined factor concentrates is not available.
- Acute disseminated intravascular coagulation (D.I.C)
- Thrombotic thrombocytopenic purpura (T.T.P)

Conditional use:

- Immediate reversal of Warfarin - in the presence of life or limb threatening bleeding. The Prothrombin Complex Concentrate is the component of first choice in these circumstances (see section on PCC)
- FFP is not indicated for the routine reversal of Warfarin
- Massive transfusion (see massive haemorrhage appendix)
- Liver disease

Note for hypofibrinogenaemia cryoprecipitate or fibrinogen concentrate is likely to be indicated. Please seek specialist advice.

Selection of FFP

U.K sourced FFP from single donors:

- Donors are predominately male with no transfusion history (to reduce the risk of TRALI) and virally tested as per Red cell components.
- There is no pathogen reduction process.
- This is the standard FFP component available for adults.
- Volume 180-300mL
- Contains all coagulation factors
- Usual dose 15mL/kg

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Storage / Shelf-life

FFP is stored frozen. It takes 20 minutes to defrost and be available for transfusion. After defrosting it may be kept for up to 5 days if stored at 4°C within the laboratory.

ABO / D compatibility:

Recipient's Group	O	A	B	AB
First choice	O	A	B	AB
Second choice	A	AB	AB	A
Third choice	B	B	A	B
Fourth choice	AB	-	-	-

Tested and negative for high-titre antibodies

Group AB FFP is often in short supply

Group O FFP must only be given to group O recipients

The D status of the FFP is unimportant due to the lack of red cell contamination and D positive FFP can safely be given to D negative recipients, including women of childbearing age.

Special transfusion requirements

There are no reported cases of graft versus host disease or cytomegalovirus with FFP. Therefore FFP does not need to be irradiated or CMV tested.

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Appendix 4: THE USE AND ADMINISTRATION OF PROTHROMBIN COMPLEX CONCENTRATE (PCC).

Prothrombin complex concentrates (PCC) are concentrates of Factors II, VII, IX and X. The available products are used for the emergency reversal of Warfarin therapy. PCC will be issued from the BTL following consultation with the Haematology SPR/ Consultant. The administration should be under the direction of a doctor belonging to the team looking after the patient.

Only staff members who have passed NPSA competency assessment for the administration of blood products within the last three years should administer blood components.

PCC is issued in 500 i μ vial sizes, with a diluent 20mL (water for reconstitution) and a factor concentrate in powder form. Dosing will be advised by the haematologist providing support and the dose is rounded up to the nearest 500 i μ vial as part vials are not given.

The BTL also supplies Berinert (C1 esterase Inhibitor) which is different from Beriplex (PCC) and care must be taken not to confuse the two different products. It is important to ensure that the correct concentrate is used.

Reconstitution:

- Where possible, allow the product to reach room temperature before reconstitution is commenced.
- PCC powder is dissolved with 20mL water for injection using the transfer device supplied, using an aseptic technique. The diluent should be added slowly to the powder to avoid frothing of the concentrate. It may take several minutes before the powder is completely dissolved and free from particles.
- Do not use solutions which are cloudy or contain particles.
- Once dissolved the prepared product should be drawn up into a syringe.
- Prepared product should be administered immediately after reconstitution. Do not refrigerate product after reconstitution.

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Administration:

- The prepared product should be administered by slow intravenous injection. Manufacturers' guidelines recommend a rate of 1mL/minute, but the rate of administration should be orientated to the degree of urgency. For life or limb threatening bleeding episodes the recommended rate of administration is 10-15 minutes per whole infusion.
- Routinely there are no specific side effects expected. However, very occasionally and in rare cases, hypersensitivity or allergic reactions may occur. These should be managed by discontinuing the PCC infusion and administering intravenous steroids and antihistamines. PCC should only be administered in areas where acute anaphylaxis can be managed.
- Take care that no blood enters the syringe filled with concentrate to prevent precipitation occurring.
- After administration any unused solution and administration equipment must be discarded appropriately.
- The batch number of each infusion should be recorded in the patient's notes.
- Any unused PCC should be returned to the BTL immediately.

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Appendix 5: SPECIAL TRANSFUSION REQUIREMENTS

There are certain special transfusion requirements that may need to be fulfilled to ensure safe transfusion practice for a particular patient.

The tables below are recommendations taken from the Handbook for Transfusion Medicine 5th edition⁽¹⁵⁾ with additional information from the British Committee for Standards in Haematology (BSH) guidelines on the use of irradiated blood products⁽¹⁶⁾ and the position statements regarding CMV negative blood components from the Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO)⁽¹³⁾.

Patient group	Irradiated blood components
All patient groups	All transfusions of cellular components and FFP from first or second degree relatives should be irradiated even if the patient is immunocompetent
Recipients of Allogeneic (donor) HSC transplantation	From the start of conditioning chemo-radiotherapy. Continue while receiving GvHD prophylaxis (usually for 6 months post transplant) If lymphocyte count is <1.0, chronic GvHD or on immunosuppressive treatment, continue irradiated blood components
Bone marrow and peripheral blood stem cell donors	Provide irradiated cellular components during and for 7 days before the harvest
Bone marrow or peripheral blood HSC harvesting for future autologous reinfusion	Provide irradiated cellular components during and for 7 days before the harvest
Autologous HSC transplant patients	From start of conditioning chemo-radiotherapy until 3 months post transplant (6 months if total body irradiation was used)
Adults and children with Hodgkin Lymphoma at any stage of the disease	Irradiated cellular components indefinitely
Patients treated with purine analogues (fludarabine, cladribine bendamustine and pentostatin)	Irradiated cellular components indefinitely
CLL or other haematological patients treated with alemtuzumab therapy.	Irradiated cellular components indefinitely

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MS, vasculitis or patients undergoing solid organ transplant treated with alemtuzumab therapy	Irradiated cellular components are NOT required
Patients receiving anti-thymocyte globulin (ATG) for the treatment of aplastic anaemia or rare types of immune dysfunction	Irradiated cellular components are required indefinitely
Intrauterine transfusions	Irradiated cellular components are required
Neonatal transfusions	Components used for exchange transfusion should be irradiated. Irradiated components are not required for standard 'top up' transfusions, unless the neonate has previously received an intra-uterine transfusion.
Severe congenital T-lymphocyte immunodeficiency syndromes with significant qualitative or quantitative T-lymphocyte deficiency	Irradiated cellular components are required. A clinical immunologist should be consulted for advice in cases where there is uncertainty
Neonates and infants with suspected immunodeficiency undergoing cardiac surgery	T-cell investigations are recommended and a clinical immunologist should be consulted. If not possible irradiated cellular components are required

Patient group	CMV negative components
Intrauterine transfusions	Required for IUT and neonates (up to 28 days after expected date of delivery)
Pregnant Women	CMV negative red cells and platelets should be provided for all elective transfusions during pregnancy (not during delivery) In an emergency standard leucodepleted components may be given to avoid delay

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Special Requirements Referral form

This form can be downloaded from:

http://nww.cardiffandvale.wales.nhs.uk/pls/portal/docs/PAGE/CARDIFF_AND_VALE_INTRANET/TRUST_SERVICES_INDEX/HAEMATOLOGY_CLINICAL_CP/PRESCRIPTIONS/EF-BLD-IRRADCMV_1.PDF

Cardiff and Vale University Health Board Department of Haematology Referral for Irradiated/CMV Products													
ID Addressograph Name: _____ Address: _____ Date of Birth: _____ Hospital Number: _____ <div style="display: flex; justify-content: space-around;"> Male/Female Private/NHS </div>	<p style="text-align: center; color: red; font-weight: bold;">TO BE COMPLETED BY BLOOD TRANSFUSION LABORATORY</p> <table border="1" style="width: 100%;"> <tr> <td>Date Received (Date stamped)</td> <td></td> </tr> <tr> <td>Flag added to Telepath</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Full name</td> <td></td> </tr> <tr> <td>Grade</td> <td></td> </tr> <tr> <td>Confirmation email</td> <td style="text-align: center;">Y/N</td> </tr> </table>	Date Received (Date stamped)		Flag added to Telepath		Signature		Full name		Grade		Confirmation email	Y/N
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Confirmation email	Y/N												
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Reason for Referral _____													
<p style="color: red; font-weight: bold;">Person Referring (Blood prescribers only on diagnoses or first treatment)</p> <table border="1" style="width: 100%;"> <tr> <td>Signature:</td> </tr> <tr> <td>Full name:</td> </tr> <tr> <td>Status:</td> </tr> <tr> <td>Bleep number:</td> </tr> <tr> <td>Email Address:</td> </tr> <tr> <td>Date:</td> </tr> <tr> <td>Location of referral:</td> </tr> </table>		Signature:	Full name:	Status:	Bleep number:	Email Address:	Date:	Location of referral:					
Signature:													
Full name:													
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Bleep number:													
Email Address:													
Date:													
Location of referral:													
<p style="color: red; font-size: small;">Return completed form to Blood Transfusion Laboratory. Contact Blood Transfusion Laboratory on the extension: UHL 25389 Bleep 4844 UHW 42157 Bleep 5268</p>													

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Advice regarding requirement for Irradiated and CMV negative	
Not all immunocompromised patients require irradiated and CMV negative blood components. The tables below are recommendations taken from the Handbook for Transfusion Medicine 5th edition.	
Patient Group	Irradiated Blood Components
Adults or children with acute leukaemia	Not required (except for HLA- selected platelets or donations from first or second degree relatives)
Recipients of Allogeneic (donor) HSC transplantation	From the start of conditioning chemo-radiotherapy. Continue while receiving GvHD prophylaxis (usually for 6 months post-transplant). If chronic GvHD or on immunosuppressive treatment, continue irradiated blood components
Bone marrow and peripheral blood stem cell donors	Provide irradiated cellular components during and for 7 days before the harvest
Bone marrow or peripheral blood HSC harvesting for future autologous reinfusion	Provide irradiated cellular components during and for 7 days before the harvest
Autologous HSC transplant patients	From start of conditioning chemo-radiotherapy until 3 months post-transplant (6 months if total body irradiation was used)
Adults and children with Hodgkin Lymphoma at any stage of the disease	Irradiated cellular components indefinitely
Patients treated with purine analogues (fludarabine, cladribine and deoxycoformicin (irradiated components are recommended for newer purine analogues and related compounds such as bendamustine until further data are available	Irradiated cellular components indefinitely
Patients treated with alemtuzumab therapy. Irradiated components are also recommended for solid organ transplant patients receiving alemtuzumab.	Irradiated cellular components indefinitely
Patients receiving anti-thymocyte globulin (ATG) for the treatment of aplastic anaemia	Irradiated cellular components are required
Intrauterine transfusions	Irradiated cellular components are required
Neonatal transfusions	Components used for exchange transfusion should be irradiated. Irradiated components are not required for standard 'top up' transfusions, unless the neonate has previously received an intra-uterine transfusion.
CMV Negative Components	
Intrauterine transfusions	Required for IUT and neonates (up to 28 days after expected date of delivery)
Pregnant Women	CMV negative red cells and platelets should be provided for all elective transfusions during pregnancy (not during delivery). In an emergency standard leucodepleted components may be given to avoid delay
Granulocyte transfusions	CMV negative patients should receive. CMV negative granulocytes

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Appendix 6: MASSIVE HAEMORRHAGE

Critically ill patients requiring massive transfusion require the rapid availability of blood components, laboratory investigations and expert haematological advice. Massive blood loss may be defined as the replacement of a patient's total blood volume with stored blood in less than 24 hours, although alternative definitions allowing more anticipation (such as 50% blood volume loss within 3 hours, or a loss of 150 mL/min) may be a more useful clinical guide. The importance is to recognize blood loss early and institute effective action promptly in order to prevent the onset of shock and its consequences in the patient. ^(8, 9)

Patients with massive blood loss are not a homogenous group. They present in a range of specialties and the UHB has developed local major haemorrhage protocols with adaptation's for specific clinical areas see hyperlinks listed below for specific MHP protocols:

All medical, nursing, laboratory and support staff must know where to find the haemorrhage protocol in relevant areas and be familiar with their contents. It is recommended that their knowledge should be supported by training and regular drills.

Within all of these protocols a successful outcome requires prompt action and good communication between various clinical specialties, diagnostic laboratories and Blood Transfusion Laboratory staff. Involvement with specialist coagulation either by agreed replacement protocols or bespoke advice will allow the optimal use of blood product and pharmacological agents.

Thromboprophylaxis should be given after major haemorrhage and should be started as soon as possible after bleeding ceases.

There are specific procedures for obtaining blood in an emergency for neonatal patients and these are displayed locally within the relevant clinical areas as a controlled document.

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/D419B9607A07D0D0E0400489923C24DB> Cardiac Theatre/CITU MHP (Llandough)

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/B9D01B038FB1C8F5E0500489923C2BA2> Cardiac Theatre/CITU portetrac (Llandough)

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/D41BD0FAC E18BEEFE0400489923C3526> A&E MHP

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<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/1118D0FA54F3F794E0500489923C2500> A&E Portertrac MHP

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/B9CD3EAFBF168557E0500489923C230B> A&E Paediatric MHP

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/D41B0680F85646E6E0400489923C27C1> Obstetric MHP

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/D41A71D580D29E59E0400489923C22EC> General Theatre/ICU MHP

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/D41B0680F84046E6E0400489923C27C1> UHL General MHP

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/10DBEDDF6D141151E0500489923C42DD> UHW General Portertrac MHP

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/D41BD4385A4549E1E0400489923C355C> UHW General MHP

<http://nww.cardiffandvale.wales.nhs.uk/pls/portal/url/ITEM/B18A192C23E04713E0500489923C3C0C> X-RAY MHP

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Blood components provided during massive haemorrhages

Blood Components available for Massive Haemorrhages in UHW and UHL

Massive Haemorrhage Protocols / EU - Resus

Emergency Unit – RESUS - NEONATE	Emergency Unit – RESUS - < 10kgs INFANT	Emergency Unit – RESUS - > 10kgsCHILD	Emergency Unit – RESUS - ADULT
Pack 1 3 x NEONATAL EMERGENCY BLOOD (in a bag) Octoplas (on request) Pack 2 3 additional units (same Donor) remain available in the Cold Room if required (on request)	Pack 1 1 x O NEG RBC + 1 x FFP (in a bag) Pack 2 2 x RBCs (in a bag) 2 x FFP/ Octoplas (in a bag) 1x PLTs (in a bag, on request)	Pack 1 2 x O NEG RBC + 2 x FFP (in a bag) Pack 2 2 x RBCs (in a bag) 2 x FFP/ Octoplas (in a bag) 1x PLTs (in a bag, on request)	Pack 1 2 x O NEG or O POS RBC + 2 x FFP (in a bag) Pack 2 4 x RBCs (in a bag) 4 x FFP/ Octoplas (in a bag) 1x PLTs (in a bag, on request)

These amounts may change at any time due to the supply and demand of blood components from the Welsh Blood Service. Clarification can always be sought from the Blood Transfusion Laboratory on ext 42157 bleep 5268 UHW or ext 25389 bleep 4844 UHL. Reference LI-BLD-2MassTx

Blood Components available for Massive Haemorrhages in UHW and UHL

Other Massive Haemorrhage Protocols / Neonatal Emergency Blood:

General Wards including Paediatrics, Main Theatres, GITU	Obstetrics	Cardiac Theatres & CITU	Neonatal Unit (SCBU/NUU)
6 x RBCs (2 in a bag) 4 will remain in the issue fridge, until required 4 x FFP/ Octoplas (on request)	MHP IMMEDIATE 6 x RBCs (2 in a bag) 4 will remain in the issue fridge until required MHP ON HOLD 6 x RBCs (place all in the issue fridge) 4 x FFP/ Octoplas (on request) Fibrinogen as requested – NO Haem SpR authorisation required	6 x RBCs (2 in a bag) 4 will remain in the issue fridge until required 4 x FFP/ Octoplas (on request) 1 x Platelets (on request) Fibrinogen as requested – NO Haem SpR authorisation required	3 x NEONATAL EMERGENCY BLOOD (in a bag) Octoplas (on request) Pack 2 3 additional units (same Donor) remain available in the Cold Room if required (on request)

These amounts may change at any time due to the supply and demand of blood components from the Welsh Blood Service. Clarification can always be sought from the Blood Transfusion Laboratory on ext 42157 bleep 5268 UHW or ext 25389 bleep 4844 UHL. Reference LI-BLD-2MassTx

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Appendix 7: ORDERING URGENT BLOOD/COMPONENTS

If blood/components are required urgently the BTL (UHW - ext 42157, Bleep 5268, UHL - ext 25389, Bleep 4844) should be contacted by the requesting clinician as soon as possible indicating the blood/component and quantity required and the level of urgency. Discussion can then take place between clinician and BTL regarding the appropriate blood/component to be provided.

There is a dedicated Massive Haemorrhage Protocol for massive haemorrhages – see appendix (MHP)

The preferred working practice is for the doctor to then send a request form urgently to the BTL; if, due to the nature of the emergency, this is not a viable option, a verbal request can be taken over the telephone. The verbal request must include:

- Patient's Full Name (first and surname)
- Date of Birth
- Hospital number or NHS Number
- 1st Line of Address
- Gender
- Patient Location
- Component required and quantity
- Contact details for requesting doctor

All difficult names or street names should be spelled out phonetically to avoid confusion. These details must be read back to the person making the request for their confirmation.

If the patient is admitted as an emergency and their demographic details are unknown the verbal request or request form must contain:

- Emergency Number
- Gender
- Patient Location
- Component required and quantity
- Contact details for requesting doctor

Collection of blood/components in an emergency

Under normal circumstances the porter would collect the blood/component collection slip from the clinical area/ or print out, as defined in collection. However in an emergency situation there may not be enough time for a porter to visit the clinical area,

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however the porter needs patient details to ensure the right component is collected for the right patient. This can be done either by:

1. Clinical staff entering details onto portertrac in UHW (the urgent box should be ticked)
2. Request porter collect a blood collection slip from the clinical area in UHL via symbiotics
3. Give details over the phone

Details required:

Patient's Full Name (first and surname)
Date of Birth
Hospital number or NHS Number
1st Line of Address
Patient Location
Component required and quantity

If details are taken via telephone, the Portering Supervisor will record the details appropriately on the Portertrac system and then read them back to double check that they have the correct information. The Portering Supervisor will then allocate the task as soon as possible to the next available Porter. The information will be given to the Porter and the Porter will repeat the information given to them.

Any difficult names or street names should be spelled out phonetically to avoid confusion.

If the patient is admitted as an emergency and their demographic details are unknown the verbal request or collection slip must contain:

Emergency Number
Gender
Patient Location
Component required and quantity
Contact details for requesting doctor

If a current Blood group and antibody screen (G&S) is not available an appropriately labelled sample must be brought promptly to the BTL.

It is a clinical decision to transfuse blood components when there has been insufficient time to complete full compatibility testing and this may result in adverse events (immediate or delayed transfusion reactions) as the patient may have unidentified antibodies.

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O D Negative and O D Positive units

A stock of O D Negative blood for emergency use is maintained by the BTL at UHW and UHL. This must only be used when delay in transfusion will jeopardise the patient's life.

Women of child bearing potential must have D negative blood issued until their D type is determined. If such patients are found to be D positive, R1R1, K- blood should be issued. If possible, until their c antigen is known.

Women without child bearing potential and males may have D positive blood in life threatening, major haemorrhage situations.

ABO and D group specific uncrossmatched units

On receipt of the sample blood can be issued which is ABO and D group specific uncrossmatched within 15 minutes. This preserves the stock of O D negative blood.

Fully compatible (cross matched) units

If the patient has not had a recent blood group and antibody screen request, blood can be issued in emergency situations with a minimum turnaround time of 60 minutes of the BTL receiving a correctly labelled sample if the antibody screen is negative (The BTL must be informed by the clinical area of the urgency).

Patients with atypical antibodies

The patient's plasma is screened to identify any atypical red cell antibodies of potential clinical significance. These usually occur after sensitising events and are directed against other blood group antigens (e.g. Kell, Duffy, Kidd) on the surface of red cells. If such antibodies are identified every effort is made to provide blood which is negative for the corresponding antigen to avoid the risk of haemolytic transfusion reactions. This is a time consuming process and will delay the provision of blood. If a patient should need blood urgently the Consultant Haematologist can advise on the severity of risk if blood is given that is not fully compatible. This risk must be balanced with the risk of delaying transfusion.

The BTL must be informed of any changes to the patient's clinical condition that may be significant to their transfusion requirements.

Platelets may be issued immediately on a confirmed blood group but it should be noted that the availability of this resource is limited and they may need to be

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ordered from the WBS. If additional Fresh Frozen Plasma (FFP) is required it should be noted it takes 20 minutes to thaw.

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Completion of Transfusion Request Form

PRESS FIRMLY ON EACH END TO ENSURE A LEAKPROOF SPECIMEN CARRIER

BLOOD TRANSFUSION

TRANSFUSION REQUEST

NHS No	Sample No
Hosp No	DOB (dd/mm/yyyy)
Last Name	Gender: M / F
First Name	Private / NHS
Address	Hospital
Post code	Ward/Dept
	Consultant
	Date

Reason for Request / Clinical Details

SPECIAL REQUIREMENTS

Irradiated

CMV Neg

HLA Matched

HEV Neg

Check with patient, clinical history or transfusion laboratory

Test Required	Units Required (Number)
Group & Save <input type="checkbox"/>	Red Cells <input type="checkbox"/>
Crossmatch <input type="checkbox"/>	Fresh Frozen Plasma <input type="checkbox"/>
DAT <input type="checkbox"/>	Albumin (4.5% / 20%) <input type="checkbox"/>
Kleihauer <input type="checkbox"/>	Platelets <input type="checkbox"/>
	Anti-D (dose) <input type="checkbox"/>
	Cryoprecipitate <input type="checkbox"/>
	Other <input type="checkbox"/>

Date/ Time Required:

Requested by: (Print Name) Signature Ext / Bleep No

FOR COMPLETION BY THE PERSON TAKING THE SAMPLE
FAILURE TO COMPLETE THIS SECTION WILL RESULT IN SAMPLE REJECTION

ALL INPATIENTS AND DAY CASES MUST WEAR AN IDENTITY BAND
I confirm that I positively identified the above named patient by checking that all relevant details matched before taking the sample.

Date sample taken: Time:

Taken by: (Print Name) Signature: Ext Bleep No.:

FOR URGENT REQUESTS TELEPHONE THE TRANSFUSION LABORATORY

LABORATORY USE ONLY

Sample acceptance criteria met? YES / NO

Sample checked by:(Name)

WHBTS - December 2014

An addressograph is acceptable on the request form
 Ensure the top section of the pre transfusion form is completed **BEFORE** going to the patient's bedside.

Use the Pre Transfusion form as part of your positive patient ID

Ask the patient to state their Full name, first line of address and Date of Birth. Check all patient details on form against patient wristband

Consider Special Requirements Does the patient need Irradiated, HEV or CMV neg?

Provide relevant clinical details to the laboratory

Test required, amount and date products needed

Requested by filled in with Name and contact details

Fill in ALL sections of the Declaration. Signature on the form and sample has to match.

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Blood Transfusion Request Form – 2021

Patient details
addressograph can be used here, but the requester must check these details are correct

Indication Code
if requesting component for transfusion for an adult patient, refer to the list on the reverse of the form and enter the indication code here; Note: indications for neonatal/ paediatric transfusion will differ from these

Test Requested
if requesting component for transfusion, tick 'Group & Screen' and complete the next section; a 'Test Requested' may not always be required (e.g. for albumin)

Units or Products required
indicate what is wanted & when; if requesting Cryoprecipitate or Fibrinogen concentrate delete the other; if requesting Albumin indicate which concentration

BLOOD TRANSFUSION	
TRANSFUSION REQUEST – BLOOD SAMPLE	
NHS No	Lab Sample No
Hospital No	Laboratory use only
Last Name	DOB (dd/mm/yyyy)
First Name	Sex* (as assigned at birth)
Address	Ward/Dept
	Private / NHS
	Postcode
	Consultant
	Date
INDICATION CODE <i>(refer to guidance on reverse)</i>	Reason for Request / Clinical Details:
Tick here if the patient is on a monoclonal antibody which interferes with blood grouping <input type="checkbox"/> Additional testing required, early identification will prevent avoidable delays in blood provision.	
SPECIAL REQUIREMENTS: Irradiated <input type="checkbox"/> CMV Neg <input type="checkbox"/> HLA Matched <input type="checkbox"/>	
Check with patient, clinical history or transfusion laboratory	
FOR URGENT REQUESTS TELEPHONE THE TRANSFUSION LABORATORY	
Test Requested: Group & Screen* <input type="checkbox"/>	DAT <input type="checkbox"/> Kleihauer <input type="checkbox"/>
*If Units or Products are required – state the number/volume/dose, and date & time required:	
Red Cells	Albumin (4.5% / 5% / 20%)
Platelets	Anti-D
Fresh Frozen Plasma	Other Product (name and dose):
Cryoprecipitate/ Fibrinogen conc. <i>(delete as appropriate)</i>	Date & Time required: / / : : :
Requested by: (Print Name)	Signature: Ext/Bleep/Mobile:
Professional registration number (GMC / NMC / etc.):	
FOR COMPLETION BY THE PERSON AFTER TAKING THE SAMPLE FAILURE TO COMPLETE THIS SECTION WILL RESULT IN SAMPLE REJECTION	
ALL INPATIENTS AND DAY CASES MUST WEAR AN IDENTITY BAND	
I confirm that I positively identified the above named patient by checking that all relevant details matched BEFORE taking the sample.	
Date sample taken: / /	Time: : :
Taken by: (Print Name)	Signature: Ext/Bleep/Mobile:
Sample acceptance criteria met? YES / NO	LABORATORY USE ONLY Checked by: (Print Name)

Reason for Request
why is the test/ transfusion being requested; enter all relevant clinical information here

Monoclonal Antibody
treatments such as Daratumumab can interfere with blood grouping – so the transfusion laboratory needs to know this

SPECIAL REQUIREMENTS
the requester must identify any special transfusion requirements and indicate them here

Requested by
the requester must print name, sign and write contact details here; the requester does not complete the buff section below – this is for the sample taker to complete

Professional registration number
the requester should write their number here

Blood Transfusion Request Form – 2021

Blood Components App

An app has been developed to act as a prompt to facilitate appropriate use of blood components and assist with the use of indication codes; this is available to download free on Apple and Android devices by searching 'blood components' on App store or Google Play

Patients Identification
the request form **must** contain the patient's first & last name, DOB & NHS/ Hospital no.; if the patient identity is unknown the identifiers to be used here should be prescribed in your local organisational policy

Sample Validity
a Group and Screen will be valid (i.e. blood component can be issued against the sample) for a maximum of 7 days from when the sample was taken; validity reduces to 3 days in some circumstances

BLOOD TRANSFUSION

INDICATIONS FOR TRANSFUSION (BASED ON GUIDELINES FOR THE USE OF BLOOD COMPONENTS IN ADULTS)

Doc. Cat. (BMC) Dose – in the absence of active bleeding, use the minimum number of units required to achieve a target Hb. Assume an increment of 50g/l per unit for an average adult.

R1 Acute Bleeding Acute bleeding with haemodynamic instability, when crossmatch has been achieved / crossmatch frequent measurement of Hb. Indicate by cross patient testing. Should be used to guide the use of red transfusion – see separate Freshwhole blood.

R1a Hb < 70g/l Stable patient. Acute severe. Consider on Hb trended at 2g/l, use requirement of 2 units to patient on all transfusion. There are no other considerations (based on acute consideration of the situation e.g. hypotension, anaemia).

R1b Hb < 80g/l Stable patient and acute coronary syndrome. Use on Hb trended at 2g/l, use a target Hb of 80-100g/l.

R1c Hb < 90g/l transfusion dependent anaemia. Transfer to maintain a Hb which prevents symptoms, support on Hb trended at 2g/l, where an adult or critical, investigate why patient requires transfusion. No transfusion depending on age and diagnosis.

R1d Haemotherapy maintain Hb > 80g/l There is some evidence for maintaining an Hb of 80g/l in patients receiving chemotherapy for curative and possibly other tumours.

R2 Exchange Transfusion

Platelets Dose – for prophylaxis, do not routinely transfuse more than 1 adult therapeutic dose. Prior to invasive procedure or to treat bleeding, consider the size of the patient, previous increments and the target count.

Prophylactic platelet transfusion

R1 Plt < 10 x 10⁹/l in reversible bone marrow failure (BMF)
Transfusion not indicated in adults. BMF if not on antineoplastic treatment, and not bleeding

R2 Plt 10-20 x 10⁹/l with sepsis / haemostatic abnormality, or additional risk factor for bleeding

R3 Prior to invasive procedure or surgery

R3a To prevent bleeding associated with invasive procedures. To avoid red count above the following thresholds for these procedures:

- Plt < 75 x 10⁹/l – central venous line
- Plt < 50 x 10⁹/l – lumbar puncture / spinal anaesthesia
- Plt < 50 x 10⁹/l – pre-operative biopsy / major surgery
- Plt < 40 x 10⁹/l – epidural anaesthesia
- Plt < 30 x 10⁹/l – critical site surgery e.g. CNS / eye

Transfusion **not** to be used to raise platelet count above 100 x 10⁹/l

Therapeutic use to treat bleeding (WHO bleeding grade 2 or above)

R4 Major haemorrhage – Plt < 10 x 10⁹/l

R4a Empirically in a Major Haemorrhage Pack / Protocol

R4b Critical site bleeding e.g. CNS – Plt < 100 x 10⁹/l

R4c Clinically significant bleeding – Plt < 50 x 10⁹/l

R4d Specific clinical conditions

R4e DIC pre-procedure or if bleeding

R4f Immune thrombocytopenia (emergency treatment pre-procedure / severe bleeding)

R4g Platelet dysfunction

R4h Consider if critical bleeding on anti-platelet medication

R4i Inherited platelet disorders (checked by specialist in haemostasis)

Fresh Frozen Plasma (FFP) Dose – 15-20 mL/kg body weight, often equivalent to 4 units in adults.

R1 Major haemorrhage: minimum transfuse 1.5 x use with FFP. Other settings give 10 or at least 2 units with FFP and coagulation monitoring. Indicated. Once bleeding controlled, further FFP guided by PT & aPTT (see table 1.5) or visual assessment, or by cross patient clinical status.

R2 PT Ratio / INR > 1.5 with bleeding. Clinically significant bleeding without major haemorrhage. FFP required (ongoing only). Ask for a FFP and aPTT ratio of 1.5 or local protocol (only for non-critical, clinically stable).

R3 PT Ratio / INR > 1.5 and pre-procedure. Indicated: use when coagulation results are abnormal e.g. disseminated intravascular coagulation, liver disease pre-procedure.

R4 Liver disease with PT Ratio/INR > 2 and pre-procedure. FFP not usually required before invasive procedure. FFP ratio / INR > 1.5 and PT time is significant of bleeding.

R5 TTP / plasma exchange

R6 Replacement of single coagulation factor

Source: National Blood Transfusion Committee (NBTC) Values in Cells for Transfusion 2020

Indication Codes for Transfusion

- Sample taker should positively identify the patient, take the sample, label the sample, and complete the pink shaded section of the request form (sections they have correctly identified the patient)
- Sample must be labelled with the patient's First Name, Last Name, DOB, NHS/Hospital No. and Sex
- Unknown patient: request form and sample labelling should be completed in accordance with local policy
- Sample must be labelled, signed, timed and dated immediately after being taken, at the patient's side; this must be legible **IMMEDIATELY** by the sample taker. Sample tube **MUST NOT** be pre-occupied
- Non-compliant sample or request **MUST NOT** be processed
- Group and antibody Screen result may be valid to issue blood components against for a maximum of 7 days from the time the sample is taken, depending on the patient's transfusion/pregnancy history

Telephone messages / alterations (for laboratory use only)

Indication Codes for Transfusion
further explanation of the codes is in the NBTC 2020 document 'Indication Codes for Transfusion – An Audit Tool'; to access follow this link:



Major Haemorrhage
a pre-transfusion sample and request form are required even when a major haemorrhage protocol is activated; the indication codes associated with this are highlighted in red (R1, P4a&4b ,F1)

Cryoprecipitate
the indications for cryoprecipitate have not been included here as this is a more specialist component often only requested by senior clinicians

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Key Clinical Words

TO ENSURE A LEAKPROOF SPECIMEN CARRIER

BLOOD TRANSFUSION

TRANSFUSION REQUEST

NHS No	Sample No
Hosp No	Laboratory use only
DOB (dd/mm/yyyy)	Hospital
Last Name	Gender M / F
First Name	Private / NHS
Address	Ward/Dept
Post code	Consultant
Reason for Request / Clinical Details	Date
	SPECIAL REQUIREMENTS
	Check with patient, clinical history or transfusion laboratory
	Irradiated
	CMV Neg
	HLA Matched
	HEV Neg
Test Required	Units Required (Number)
Group & Save	Red Cells
Crossmatch	Fresh Frozen Plasma
DAT	Platelets
Kleihauer	Cryoprecipitate
	Albumin (4.5% / 20%)
	Anti-D (dose)
	Other
	Date/ Time Required:
Requested by: (Print Name)	Signature
	Ext / Bleep No

FOR COMPLETION BY THE PERSON TAKING THE SAMPLE
FAILURE TO COMPLETE THIS SECTION WILL RESULT IN SAMPLE REJECTION

ALL INPATIENTS AND DAY CASES MUST WEAR AN IDENTITY BAND

I confirm that I positively identified the above named patient by checking that all relevant details matched before taking the sample.

Date sample taken: / / Time: : :
Taken by: (Print Name) Signature: Ext/Bleep No.:

FOR URGENT REQUESTS TELEPHONE THE TRANSFUSION LABORATORY

LABORATORY USE ONLY

Sample acceptance criteria met? YES / NO

Sample checked by: (Name)

For example it is not sufficient to say 'pre – op' as that gives the laboratory no relevant history.

However 'pre-op, laparotomy AAA repair, Hodgkin's lymphoma' or 'pre-op – renal biopsy pregnant' or 'pregnant 36/52 weeks C-section'.

Key Words:

Pregnant

Hodgkin's lymphoma

On purine analogues (fludarabine, cladribine, deoxycoformicin, bendamustine)

On alemtuzumab

On myeloma drugs (Daratumamab)

Bone Marrow Transplant (BMT)

Solid Organ Transplant

Anti-thymocyte globulin (ATG) treatment

Intrauterine transfusion

Neonatal transfusion

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All Wales Transfusion Record

ALL WALES TRANSFUSION RECORD							
1. PATIENT DETAILS <i>(Addressograph may be used)</i>							
Full Name:				NHS/Hospital N ^o			
Address:				Hospital:			
.....				Ward:			
Date of Birth:				Consultant:			
2. PRE-AUTHORISATION CHECKLIST: <i>To be completed by the person authorising the transfusion</i>							Circle below
Has a thorough clinical assessment, including the risk factors for circulatory overload, been performed and documented in the medical notes?							YES / NO
Are the indications for transfusion clearly documented in the medical notes?							YES / NO
Has the patient/parent/guardian given valid consent? <i>(Includes provision of verbal AND written information, and the opportunity to discuss. If not possible at time of transfusion, retrospective information must be given)</i>							YES / Not Possible
Does the patient have special transfusion requirements?				YES / NO	If yes please indicate: Irradiated <input type="checkbox"/>		
					CMV Negative <input type="checkbox"/> HLA Matched <input type="checkbox"/>		
3. AUTHORISATION: <i>Must be completed by the person authorising the transfusion, ONE UNIT PER LINE</i>							
CONCOMITANT MEDICATION (e.g. diuretic/antihistamine) – circle YES or NO below against each unit, and if required prescribe on the appropriate medication prescription chart.							
Date to be given	Component or Product	Amount (Adult – unit) (Paeds – mls)	Rate / Duration	CONCOMITANT MEDICATION prescribed?	Authoriser Print Name	Authoriser Signature	Unit Given
<i>Unit 1</i>	<i>Unit 1</i>	<i>Unit 1</i>	<i>Unit 1</i>	YES / NO	<i>Unit 1</i>	<i>Unit 1</i>	<i>Unit 1</i>
<i>Unit 2</i>	<i>Unit 2</i>	<i>Unit 2</i>	<i>Unit 2</i>	YES / NO	<i>Unit 2</i>	<i>Unit 2</i>	<i>Unit 2</i>
<i>Unit 3</i>	<i>Unit 3</i>	<i>Unit 3</i>	<i>Unit 3</i>	YES / NO	<i>Unit 3</i>	<i>Unit 3</i>	<i>Unit 3</i>
<i>Unit 4</i>	<i>Unit 4</i>	<i>Unit 4</i>	<i>Unit 4</i>	YES / NO	<i>Unit 4</i>	<i>Unit 4</i>	<i>Unit 4</i>
<i>Unit 5</i>	<i>Unit 5</i>	<i>Unit 5</i>	<i>Unit 5</i>	YES / NO	<i>Unit 5</i>	<i>Unit 5</i>	<i>Unit 5</i>
<i>Unit 6</i>	<i>Unit 6</i>	<i>Unit 6</i>	<i>Unit 6</i>	YES / NO	<i>Unit 6</i>	<i>Unit 6</i>	<i>Unit 6</i>
4. PRE-ADMINISTRATION CHECKLIST: <i>Must be completed for EACH UNIT by the person administering the transfusion. DO NOT PROCEED IF DISCREPANCIES ARE DETECTED</i>							
<ul style="list-style-type: none"> Patient's details, pre-authorisation checklist and authorisation are fully completed and correct Check for concomitant medication (if indicated above) and administer as prescribed Patient identifiers on the component compatibility label match the patient details above Component is correct (i.e. red cells, platelets, FFP) Special requirements (Irradiated, CMV Negative, HLA Matched) are met where indicated Component has not passed expiry date/time (midnight of date shown on front of bag) Visual check – no leaks/dischouration/clumping evident Patient blood group on the compatibility label is identical to, or compatible with, the blood group on front of bag; if unsure of compatibility contact blood bank for confirmation Unique donation number on the compatibility label is identical to the donation number on front of bag 							
5. FINAL BEDSIDE CHECK: <i>Must be completed AT BEDSIDE for EACH UNIT by the person administering the transfusion</i>							
<ul style="list-style-type: none"> Legible identification (ID) band (or approved alternative) attached to patient CONFIRM: ALL patient identifiers are correct and identical (verbal, ID band, compatibility label, All Wales Transfusion Record) 							
By signing below I confirm that I have completed the required pre-administration and final bedside checks as described in Section 4 and Section 5 of this record							
Sign:	<i>Unit 1</i>	<i>Unit 2</i>	<i>Unit 3</i>	<i>Unit 4</i>	<i>Unit 5</i>	<i>Unit 6</i>	

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PATIENT NAME:		NHS/Hosp N°:							
Complete this chart for each unit transfused. Use the National Early Warning Score (NEWS) Chart if deviations from baseline are noted									
Unit 1	Where used, attach adhesive portion of blood label here If not available record the unique 14 digit donation number 	Date:	Observation Interval	Temp	Pulse	Resps	BP	Time	Initial
		Start Time:	Pre-transfusion						
		End Time:	15 minutes						
			End						
Unit 2	Where used, attach adhesive portion of blood label here If not available record the unique 14 digit donation number 	Date:	Observation Interval	Temp	Pulse	Resps	BP	Time	Initial
		Start Time:	Pre-transfusion						
		End Time:	15 minutes						
			End						
Unit 3	Where used, attach adhesive portion of blood label here If not available record the unique 14 digit donation number 	Date:	Observation Interval	Temp	Pulse	Resps	BP	Time	Initial
		Start Time:	Pre-transfusion						
		End Time:	15 minutes						
			End						
Unit 4	Where used, attach adhesive portion of blood label here If not available record the unique 14 digit donation number 	Date:	Observation Interval	Temp	Pulse	Resps	BP	Time	Initial
		Start Time:	Pre-transfusion						
		End Time:	15 minutes						
			End						
Unit 5	Where used, attach adhesive portion of blood label here If not available record the unique 14 digit donation number 	Date:	Observation Interval	Temp	Pulse	Resps	BP	Time	Initial
		Start Time:	Pre-transfusion						
		End Time:	15 minutes						
			End						
Unit 6	Where used, attach adhesive portion of blood label here If not available record the unique 14 digit donation number 	Date:	Observation Interval	Temp	Pulse	Resps	BP	Time	Initial
		Start Time:	Pre-transfusion						
		End Time:	15 minutes						
			End						
Adverse Reactions: In the event of an adverse reaction or any adverse symptoms associated with the transfusion please complete below									
Was the adverse reaction documented in the patient's medical notes?					YES / NO				
Have you reported the reaction to the transfusion laboratory / practitioner?					YES / NO				
Write down the donation number of the unit being transfused at the time (if known)									
All Wales Transfusion Record			Dec 2018			Version 4			

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The All Wales Transfusion Record

From 9th November 2015 a new Transfusion Record will apply.

Front

All fields MUST be completed.

ALL WALES TRANSFUSION RECORD

1. PATIENT DETAILS (Identification must be correct)

2. PRE-AUTHORISATION CHECKLIST (to be completed by the person authorising the transfusion)

3. PRESCRIPTION (to be completed by the person authorising the transfusion)

4. PRE-ADMINISTRATION CHECKLIST (to be completed by the person administering the transfusion)

5. FINAL BEDSIDE CHECK (to be completed by the person administering the transfusion)

Addressograph may be used

- Completed by Authoriser**
- Ensure correct patient details

Pre-Authorisation checklist

- Completed by Authoriser**
- Indications
 - Patient information
 - Special requirements

Prescription

- Completed by Authoriser**
- One unit per line
 - Adults in units
 - Paediatric in ml's
 - Up to 6 units can be prescribed per Transfusion Record
 - Concomitant medication MUST be prescribed on All Wales Drug Chart

Pre-Administration checklist

- Completed by Administrator**
- Checklist should be completed for each unit BEFORE the transfusion is started

Final bedside check

- Completed by Administrator**
- Confirm positive patient identification
 - No wristband - No transfusion

Rear

Complete this chart for each unit transfused - use the National Early Warning Score (NEWS) Chart if available from localities are noted

Date	Observation interval	Temp	Pulse	Resp	SpO2	Urea	Other
09-11-15	Pre transfusion	36.7	77	14	100	0.9	100
	15 minutes	36.5	80	15	100	0.9	100
	1 hr	36.8	81	14	100	0.9	100

Affix your peel-off label here

Where necessary, in the event of an adverse reaction to any above symptoms associated with the transfusion above consider below:

Was the patient's reaction documented in the patient's medical notes? (Y/N)

Have you reported the reaction to the transfusion laboratory / practitioner? (Y/N)

Apply a label to the back of the unit being transfused at the time if noted

Complete in the event of a transfusion reaction

For more information contact:

Ann Patterson (Ann.patterson@wales.nhs.uk)
or Sam McWilliam (Samantha.mcwilliam@wales.nhs.uk)
 UHW 44594 Bleep 6096



Wales Medical Professional
 Council of Wales
 University Health Board


Note: At present, the Hospital Number is considered acceptable as the Patient Identifier. It should be recognised that the NHS Number will become the unique identifier for all patient-related interventions.

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Example of a Porter/Collection Slip

Date:..23/01/2014... Time of request:...09:20...


Request for..1 Unit, RBC...Ward..A5, Urology..

Patient's  **U999999SM27-NOV-1965**

Full Name.. Thomas, Alex ..
1 Castle Street

Address.....

Hosp.No.... Cardiff, CF15 7RL



Porter's Signature..... Time of receipt of blood.....

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Example of blood request via Portertrac for UHW site only

UHW OBTAINING BLOOD VIA PORTERTRAC INSTEAD OF USING BLOOD SLIPS DURING COVID-19

1. Select Task then New Task (see below)
 2. In Task Type select BS and Blood Slip (see below)
 3. In Comments enter Patient's five core identifiers
 4. Make sure to include what product you need porter to collect (i.e. RBC, FFP, Platelets).
- Please add location where to be returned (i.e. bed number, or north or south).

Pt Innovise Portertrac Pro - University Hospital of Wales Cardiff

Administration | Time Management | **Tasks** | Patients | Task Utilities | General Utilities | About

Administration | Time Management | **Tasks**

New Task | Book Task | Assign | Start Task | End Task | Hold Task

New Task

Supervisor: S Ursell

Building: University Hospital of Wales Cardiff

Task Type: BS | Blood Slip

Transport Type: W | WALK

From Location: A2 | A2

Room: N/A | Not Applicable

To Location: BB | Blood bank

Room: N/A | Not Applicable

Category: Default

Patient Name: Alex Thomas

Comments: 1 Castle Street
27/11/1965
U9999999
x1 UNIT OF RBC, Please return to BED ONE

Customer: [Empty]

Ref Number: 4694976

OK

Cancel

Common Tasks

Task Type	Category	Transport	From	From room	To
AN	Default	W	CON	Not Applicable	WA
CC	Default	W	CON	Not Applicable	CECG
CC	Default	W	CON	Not Applicable	DU
CC	Default	W	CON	Not Applicable	MOB
CC	Default	W	CON	Not Applicable	NUTT

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Traceability Labels.

Please be aware that the Blood Safety & Quality Regulations (BSQR) 2005 (50) states that NHS Trusts will –

“Maintain, for not less than 30 years, the data needed for full traceability of blood or blood components”.

Clinical area (ward staff) responsibilities:

1. A traceability label must be attached to each unit of blood or blood component issued to a patient for transfusion.
2. The traceability label **must** be completed in full and signed by the qualified member of staff who administered the unit and returned to the Blood Transfusion laboratory (BTL) within 48 hours as a confirmation of the transfusion. Labels returned incomplete or not returned have to be marked as transfused as an unconfirmed transfusion and are reported to the Patient Safety leads.
3. Each section of the traceability label is explained in detail in the picture below:

1. STOP BEFORE TRANSFUSION READ THE INFORMATION THE REVERSE

Surname: Thomas
 First Name: Alex
 Address: 1 Castle Street

D.o.B. 27/11/1965 Sex: M
 Patient no. U999999S Blood Group: A Pos

2. COMPLETE THE TRANSFUSION DETAILS

Date Time
 Location
 Administered by, (initials),
 Signature:
 Patient No.U999999S.....
 Surname:Thomas.....
 First Name:Alex.....
 D.o.B.27/11/1965..... Sex: M.....
 Laboratory: ...UHW..... Sample: G1517073789153

3. AFFIX THIS PEEL OFF LABEL IN PATIENT'S RECORD

Patient No. U999999S
 Surname: Thomas
 Donation No. G151 707 378 915 3
 Red Cells A +

4. TEAR ALONG DOTTED LINE AND RETURN THIS PORTION TO THE TRANSFUSION LABORATORY

Leave the top part attached to the transfusion, discard with the blood bag at the end of the transfusion

Detach the label along the perforation – take care not to rip the bar codes

Complete ALL fields and return to Blood Transfusion Laboratory as soon as possible

Place the adhesive strip in the patient's All Wales Transfusion Record (pink blood form) before sending the completed label to Blood Transfusion Laboratory.

Return all traceability labels via internal mail, specimen round or POD system.

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Please note the traceability labels will be changing to example below. Further communication will be sent regarding this closer to the time



RETURN THIS PORTION OF LABEL

Donation NR,

Hosp NR. NHS NR.

Last Name

First Name(s)

DOB Ward/Dept

Sample No. Sex

Product Code

By completing this portion you are verifying whether ANY of the unit has been given or not.

Commenced 1 None given 2

Signature(s) _____

Print Initials _____

Ward: _____

Date _____ Time _____

For laboratory use only

Fate of unit: 3 4 5

Start transfusion, tick and sign label, tear at perforation and place for collection or return to Transfusion Laboratory



STOP! Before transfusion read the information on the reverse

Donation NR,

Hosp NR. NHS NR.

Last Name

First Name(s)

Address

DOB Patient's Blood Group

Comments Sex

Label size: 50mm x 20mm

Hosp No. _____

Name _____

Donation No. _____

Product _____

Blood group _____



STOP!
Before transfusion, carry out these checks

1. Ask patient to state their FULL NAME, ADDRESS and DOB.
2. These details **must** match the information on the wristband and this label.
3. If the patient is unable to identify themselves, take extra care in confirming I.D.
NO WRISTBAND
NO TRANSFUSION
4. Check the Donation Number is the same on the bag and this label.
5. Check expiry date of unit.
6. If any details do not match
DO NOT TRANSFUSE and contact the laboratory.
7. If a transfusion reaction is suspected, STOP the transfusion. Seek medical advice. Contact the transfusion laboratory.





IMPORTANT

IT IS A LEGAL REQUIREMENT under the Blood Safety and Quality Regulations (2005/50) that there is full Traceability of all blood components.

To comply with this the tear-off section of this label must be completed and returned to the Blood Transfusion Department when the transfusion starts.

(Local policy may require you to return the label or place it in the designated collection point)

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Appendix 9 – Sample Acceptance Criteria

The first part of the request form **MUST** contain the following details:

- First name
- Last name
- First line of address
- Date of birth
- Hospital/NHS number
- Name and signature of requesting doctor/nominated deputy

Other fields to be completed on the form in line with best practice, the absence of which would not exclude the sample from being processed:

- Gender
- Location (e.g. ward)
- Consultant
- Date that the blood sample was requested
- Ext/Bleep number of the requesting doctor
- Reason for transfusion/relevant transfusion history
- Number and type of blood components required (if any)
- The date and time that blood components are required

Request forms with incomplete or illegible patient details are not suitable for processing and will result in rejection and a new sample requested.

Patient Identification Declaration:

Positive patient identification is essential and the person taking the pre-transfusion sample is responsible for the completion of the second/middle part of the request form. The signature on this part of the form and on the sample confirms that the person signing has followed the correct procedure and they accept responsibility that the sample was taken from the patient identified on the request form.

In accordance with best practice, the person taking the sample must print their name and add their signature. However, if only a legible signature is available (but the identity of the individual who took sample can be determined), and this is comparable to the signature on the sample, then this is deemed acceptable. The date the sample was taken must also be indicated on the form.

Pre Transfusion Sample

The person taking the sample must handwrite the sample label legibly immediately after the sample is taken, beside the patient. Labelling for each patient should be completed before the next patient is bled. Sample labels must

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never be filled in before the specimen is drawn, as this is a leading cause of transfusion accidents.



The Sample must contain

First name

Last name

First line of address

Hospital number

Date of birth

Signature of phlebotomist

Ward

Gender

Date

Time bled

Signature on the sample bottle must match the signature on the declaration on the pre transfusion sampling form.

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Quality Requirements for Pre-transfusion Samples

Request Form	Sample	Accept	Reject	Reason for acceptance or rejection
123123 Anne Jones 01/01/2001 Meadowbank	123123 <i>Ann Jones</i> 01/01/2001 Meadowbank		✓	1 st name spelling difference
123456 Ann Joyce Jones 12/12/88 1 High Street	123456 <i>Ann Joyce Jones</i> 12/12/88/ 1 High Street		✓	Hyphenated on form not on sample
123123 Anne Elizabeth Jones 01/01/2001 Meadowbank	123123 <i>Anne Jones</i> 01/01/2001 Meadowbank	✓		The dataset only requires 1 st and last name
123123 Anne Elizabeth Jones 01/01/2001 Meadowbank	123123 <i>Anne Jones</i> 01/11/2001 Meadowbank		✓	Difference in DOB
123123 Anne Jones 01/01/2001 Flat 1 Meadowbank Swansea	123123 <i>Anne Jones</i> 01/01/2001 Flat 1	✓		1st line address is all that is required
123123 Anne Jones 01/01/2001 Meadowbank Swansea	123123 <i>Anne Jones</i> 01/01/2001 Swansea		✓	1 st line of address is required
G123123S Anne Jones 01/01/2001 Meadowbank	123123 <i>Anne Jones</i> 01/01/2001 Meadowbank		✓	Hospital number not identical
123123 Anne Jones 01/01/2001 Meadowbank	123123 <i>Anne Jones</i> <i>01/01/2001</i> <i>Meadowbank</i>	✓		Different writings are acceptable - responsibility lies person signing sample
123123 Margaret Jones 01/01/2001 Meadowbank Swansea	123123 <i>Mgt Jones</i> 01/01/2001 Meadowbank		✓	1 st name not identical

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Appendix 10 – Transfusion Reaction

This appendix is an aid to the recognition and immediate management of transfusion reactions⁽¹⁷⁾.

Transfusion reactions tend to occur shortly after the transfusion has commenced. Ensuring that the transfusion observations (i.e. pre-transfusion, 15 minutes into the transfusion and post-transfusion) are accurately monitored, documented and acted upon is crucial.

Acute haemolytic or bacterial transfusion reactions:

Clinical characteristics:

These are reactions with high morbidity which may occur after only a small volume of blood has been transfused. They may result from acute haemolysis (e.g. from ABO mismatch) or, more rarely, bacterial contamination. It can be difficult to tell these apart immediately. In an unconscious patient hypotension, bleeding due to DIC and oliguria may be the only signs. ABO mismatched transfusions are usually due to human error – either at the time the patient is bled for a pre-transfusion sample, in the laboratory or when the blood is given.

Aids to recognition:

- Reaction usually occurs soon after the transfusion is started
- Patient feels unwell, agitated
- Pain at infusion site, and/or back pain
- Shortness of breath
- Fever, rigors
- Hypotension
- Bleeding from wounds or venepuncture sites
- Haemoglobinuria

SHOT further define acute haemolytic transfusion reactions as being a fever and other symptoms/signs of haemolysis within 24 hours of transfusion that is confirmed by a fall in Hb, rise in Lactate Dehydrogenase (LDH), positive Direct Antiglobulin Test (DAT) and positive compatibility test.

Action:

- Discontinue the transfusion immediately
- Perform observations, temperature, pulse, blood pressure and respiratory rate.
- Detach the giving set from the cannula. Leave the intravenous (I.V.) cannula in situ and attach a 500 mL bag of 0.9% saline.

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- Recheck the bag traceability label against the information on the bag identifier and patient's wristband (check the patient identification details on the laboratory samples also).
- Inform the on-call clinical consultant responsible for the patient.
- Notify the BTL and the on-call clinical haematologist

Take blood for:

- FBC, plasma, haemoglobin (1 x EDTA bottle)
- Repeat blood group, DAT, antibody screen (1 x G&S bottle)
- Coagulation screen (including fibrinogen, thrombin, and Fibrinogen Degradation Products (FDPs), (1 x citrate bottle)
- Urea and Electrolytes (U&Es), Liver Function Tests (LFTs) and creatinine (1 x clotted bottle)
- Blood cultures
- Urinalysis
- A compatibility test using pre- and post-transfusion samples will also be required

Further action to be taken:

- Resuscitate the patient promptly – include broad-spectrum antibiotics. Consider immediate referral to critical care.
- Cap the giving set with a sterile bung to prevent leakage. Take great care not to contaminate the blood pack whilst doing this. Return the blood pack to the BTL for initial investigation via the porters. The BTL will then send the blood pack to Microbiology for continued investigations.
- Monitor urine output and ECG (observe for evidence of hyperkalaemia)
- Repeat FBC, coagulation screen and U&E 2 – 4 hourly until stable
- Observe the patient for evidence of increased red cell destruction; fall in Hb, rise in LDH, Bilirubin (LFTs), haemoglobinuria
- Also observe the patient for evidence of disseminated intravascular coagulation (DIC). A coagulation screen including fibrinogen, thrombin time and FDPs is required

Anaphylaxis:

Clinical characteristics:

Bronchospasm and circulatory collapse due to anaphylaxis may occur soon after transfusion commences. It may also be seen in IgA deficient patients reacting to transfused IgA. SHOT define an anaphylactic reaction as being hypotension with one or more of the following: rash, dyspnoea, stridor, wheezing, angioedema, pruritis, urticaria during or within 24 hours of transfusion.

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Action:

- Discontinue the transfusion immediately; detach the giving set from the cannula. Leave the I.V. cannula in situ and attach a bag of 0.9% saline.
- Maintain the airway and give oxygen.
- Inform the on-call clinical consultant responsible for the patient.
- Notify the BTL and contact the on-call clinical haematologist

The treatment of anaphylaxis will need to be urgently implemented and may include general resuscitative measures including administration of oxygen, nebulisers, adrenaline, chlorampheniramine and hydrocortisone.

The IgA level and anti-IgA should be measured. If the patient is IgA deficient, any further transfusion must be planned carefully.

Other investigations that should be carried out are a chest x-ray (CXR) if the patient is dyspnoeic to exclude Transfusion Related Acute Lung Injury (TRALI) and mast-cell tryptase. This is a clotted sample to be sent in an SST yellow-top bottle. It must be sent as close to the event as possible; 3 hours post-event and 24 hours post-event to biochemistry.

Non-haemolytic febrile transfusion reactions (NHFTR):

Clinical characteristics:

- Usually occur > 30 minutes after starting the transfusion
- Patient feels fairly well but may be shivering
- Temperature usually < 38.5 °C; BP normal

Action:

Stop transfusion and assess the possibility that this may be a more serious reaction. If no features of a more serious reaction are present, restart the transfusion at a slower rate. Consider the use of paracetamol.

Minor febrile reactions are less common following leucodepletion which now occurs at source. Haematology advice should be sought if the reactions are recurrent, or if a more severe reaction is suspected. Hydrocortisone should not be given routinely before transfusions.

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Allergic Reactions:

Allergic reactions are also common and usually consist of urticaria and itching which may begin shortly after the transfusion starts. They usually resolve if the transfusion is slowed and chlorampheniramine is given in patients who are not thrombocytopenic. The transfusion may be continued if there is no progression of symptoms after 30 minutes. No further action is generally indicated if there are no features of a more serious reaction.

The length of time the transfusion has been paused should be considered to ensure the giving set/I.V. access is patent.

Transfusion Associated Circulatory Overload (TACO):

This may occur particularly in older patients or those with poor cardiac function if too much fluid is given too quickly. It usually presents as respiratory distress secondary to pulmonary oedema. Treatment usually includes I.V. Furosemide and oxygen. Oral Furosemide (e.g. 20 mg) can be given with alternate bags of blood to elderly patients as prophylaxis.

Transfusion Related Acute Lung Injury (TRALI):

Clinical characteristics:

Acute lung injury may result following the transfusion of plasma or plasma-containing blood components, due to the interaction of donor antibodies with recipient white cells (reactions between recipient plasma and donor white cells may also occur). This may resemble adult respiratory distress syndrome (ARDS) and is most likely to occur up to 6 hours post transfusion.

Aids to recognition are:

- Respiratory compromise occurring post-transfusion without other obvious cause
- Fever, cough and shortness of breath
- Hypoxaemia
- CXR showing bilateral lung field shadows

SHOT define TRALI as acute dyspnoea with hypoxia and bilateral pulmonary infiltrates during or within 6 hours of transfusion, not due to circulatory overload or other likely cause.

Action:

- Treat as for respiratory distress syndrome with respiratory support as appropriate
- Inform the on-call clinical consultant responsible for the patient

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- Notify the BTL and contact the on-call clinical haematologist to plan investigation and management
- Laboratory investigations will need to include investigation of donor HLA and HNA antibody status; finding of cognate antigen in the patient and lymphocytotoxic compatibility testing and granulocyte compatibility testing if a patient sample is available

Delayed Haemolytic Transfusion Reactions (DHTR):

SHOT defines DHTR as fever and other symptoms/signs of haemolysis more than 24 hours after transfusion. This will be confirmed by a fall in Hb, rise in Bilirubin, positive DAT and positive compatibility testing not detectable pre-transfusion. Simple serological reactions (development of antibody without positive DAT or evidence of haemolysis) are excluded.

Clinical characteristics:

- Usually occurs 5 – 10 days after transfusion
- Patient may be febrile
- There may be an unexplained drop in haemoglobin, jaundice and urobilinogenuria

Action:

- Request FBC, reticulocyte count, U&E, LFTs, DAT, red cell antibody screen
- Compatibility testing using pre- and post transfusion samples if available
- Inform the on-call clinical consultant responsible for the patient
- Notify the BTL and contact the on-call clinical haematologist to plan management
- Observe the patient for evidence of increased red cell destruction; fall in Hb, rise in LDH, Bilirubin

Transfusion Associated Graft-versus-Host Disease (TA-GvHD)

Clinical characteristics:

Transfusion of non-irradiated blood or platelets to patients who are either immuno-compromised or have a similar HLA type to the donor can cause a severe form of graft-versus-host disease with high mortality. This usually occurs 1 – 6 weeks after transfusion.

- Unexplained fever
- Rash
- Abnormal liver function
- Diarrhoea
- Pancytopenia

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Action:

- Notify the BTL and the on-call clinical haematologist to plan management

Post Transfusion Purpura:

SHOT define this as thrombocytopenia within 12 days after transfusion of red cells, associated with presence in the patient of antibodies directed against the HPA systems.

Action:

- Notify the BTL and contact the on-call clinical haematologist to plan management
- Investigations will need to include a platelet count, coagulation screen to exclude DIC as a cause of thrombocytopenia and HPA typing and HPA antibodies

Transfusion transmitted virus infections

Clinical characteristics

These are now rare, but notification to the BTL and onward to the supplying blood service is important to trace the donor if this occurs. Symptoms depend on the virus and may include jaundice, malaise and rash. Such transfusion transmitted infections usually occur weeks or months post-transfusion.

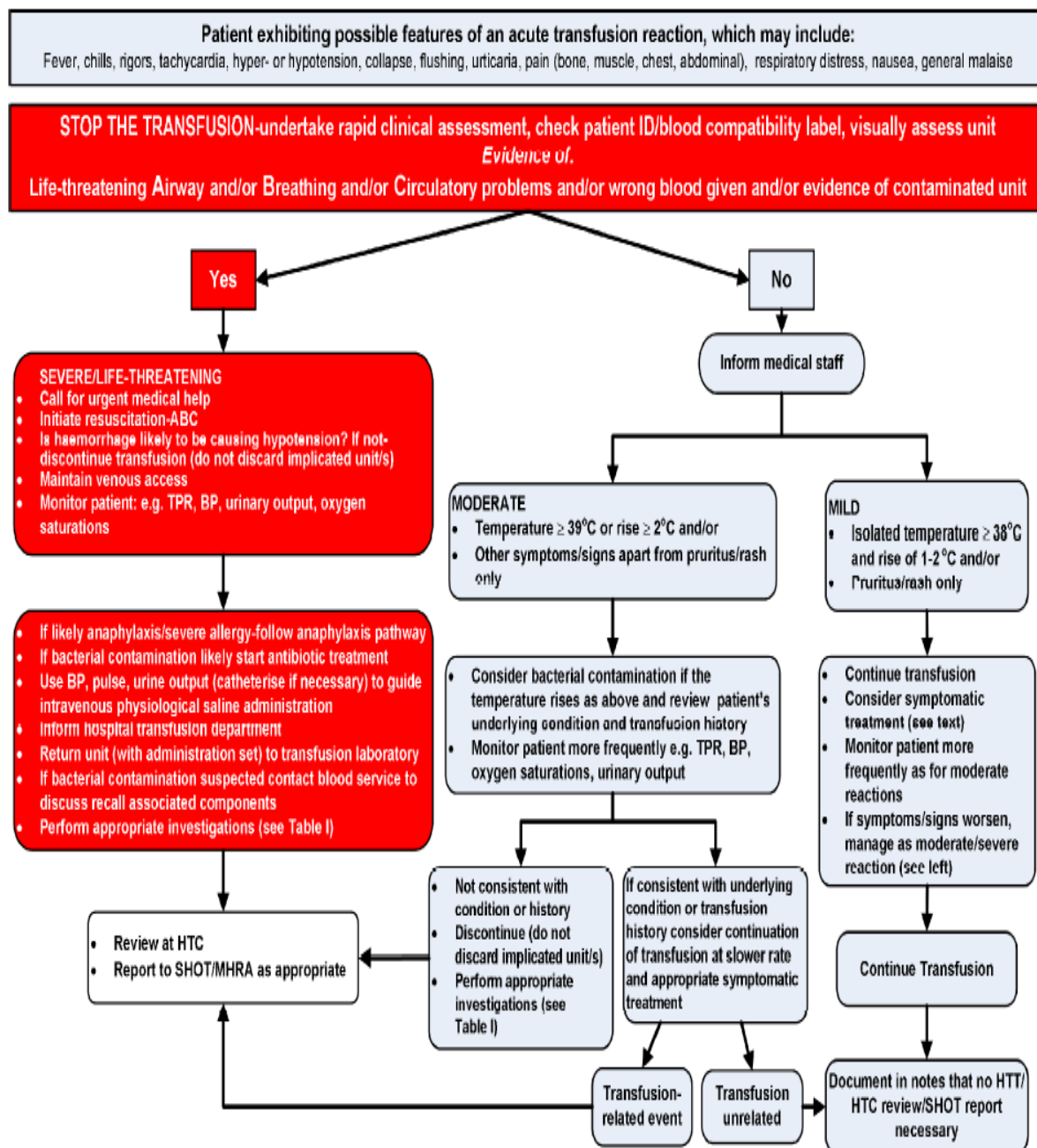
Action:

- Notify the BTL immediately
- Refer as appropriate for management of viral infection

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Guidance from BSH Guidelines for transfusion reaction⁽¹⁸⁾

Figure 1 Flow Diagram for recognition, initial management and subsequent management and investigations.



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Transfusion Reaction Aid

Symptoms /Signs	Mild	Moderate	Severe
Temperature	Temperature of $\geq 38^{\circ}\text{C}$ AND rise of $1-2^{\circ}\text{C}$ from baseline temperature	Temperature of $\geq 39^{\circ}\text{C}$ OR a rise of $\geq 2^{\circ}\text{C}$ from baseline temperature	Sustained febrile symptoms or any new, unexplained pyrexia in addition to clinical signs
Rigors/shaking	None	Mild chills	Obvious shaking/rigors
Pulse	Minimal or no change from baseline	Rise in heart rate from baseline of 10 bpm or more NOT associated with bleeding	Rise in heart rate from baseline of 20 bpm or more NOT associated with bleeding
Respirations	Minimal or no change from baseline	Rise in respiratory rate from baseline of 10 or more	Rise in respiratory rate from baseline of 10 or more accompanied by dyspnoea/wheeze
Blood Pressure (Hypo/hypertension)	Minor or no change to systolic or diastolic pressure	Change in systolic or diastolic pressure of ≥ 30 mm/Hg NOT associated with bleeding	Change in systolic or diastolic pressure of ≥ 30 mm/Hg NOT associated with bleeding
Skin	No change	Facial flushing, rash Urticaria, pruritis	Rash, urticaria and Peri-orbital oedema Conjunctivitis
Pain	None	General discomfort or myalgia Pain at drip site	Acute pain in chest, abdomen, back
Urine	Clear Normal output		Haematuria / haemoglobinuria Oliguria, Anuria
Bleeding	No new bleeding		Uncontrolled oozing
Nausea	None		Nausea or vomiting
All Green	STOP the transfusion but leave connected. Re-check identity of the unit with the patient, inform doctor. If all well, continue at reduced rate for the next 30 minutes and then resume at prescribed rate. Continue to monitor the patient carefully and be alert for other symptoms or signs of a transfusion reaction. Anti-pyretics may be required.		
1 or more Amber	STOP the transfusion but leave connected, request urgent clinical review, re-check identity of the unit with the patient, give IV fluids. If symptoms stable or improving over next 15 minutes consider restarting the unit. Antihistamines and/or anti-pyretics may be required.		
1 or more Red	STOP the transfusion and disconnect, request immediate clinical review, re-check identity of the unit with the patient, give IV fluids, inform the transfusion laboratory, contact the Consultant Haematologist.		
NOTE: In all cases where a transfusion reaction is suspected and the transfusion is stopped and disconnected, the implicated unit, complete with giving set, must be returned to the laboratory for further investigation. Follow your local transfusion policy and contact the transfusion laboratory for further instructions.			




Produced by: Wales Transfusion Practitioner Group
BBT Team Oct 2012

V2: WBS

References: Serious Hazards of Transfusion (2011), Definitions of current categories and what to report, www.shotuk.org
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SHOT TACO checklist

TACO Checklist		Red cell transfusion for non-bleeding patients	If 'yes' to any of these questions
	Does the patient have a diagnosis of 'heart failure' congestive cardiac failure (CCF), severe aortic stenosis, or moderate to severe left ventricular dysfunction? Is the patient on a regular diuretic? Does the patient have severe anaemia?	<p>1</p> <p>2</p> <p>3</p>	<ul style="list-style-type: none"> Review the need for transfusion (do the benefits outweigh the risks)? Can the transfusion be safely deferred until the issue can be investigated, treated or resolved? Consider body weight dosing for red cells (especially if low body weight) Transfuse one unit (red cells) and review symptoms of anaemia Measure the fluid balance Consider giving a prophylactic diuretic Monitor the vital signs closely, including oxygen saturation
	Is the patient known to have pulmonary oedema? Does the patient have respiratory symptoms of undiagnosed cause?		
	Is the fluid balance clinically significantly positive? Is the patient on concomitant fluids (or has been in the past 24 hours)? Is there any peripheral oedema? Does the patient have hypoalbuminaemia? Does the patient have significant renal impairment?		

Due to the differences in adult and neonatal physiology, babies may have a different risk for TACO. Calculate the dose by weight and observe the notes above.

TACO=transfusion-associated circulatory overload

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Appendix 11 Satellite Fridge

When blood is transported from the main BTL fridge to the satellite fridge it must be accompanied by the Blood Transfusion Issue Record.

The blood must be 'received' at the satellite fridge to confirm the 'cold chain' audit trail. This is done by completing the appropriate section on the Blood Transfusion Issue Record.

Only staff that have been annually trained and competency assessed, in line with NPSA SPN 14, may receive or remove blood from a satellite fridge. All staff trained and assessed as competent to access the satellite fridge will be clearly identified on the authorised user list placed on the front of the fridge door. Currently, this list is controlled by the Transfusion Practitioner Team using document control, however, the UHB will move toward a blood track system in the future which may negate the use of this document.

Patient identity must be properly confirmed when blood is withdrawn from the satellite fridge. This can be done with a correctly completed patient's All Wales Transfusion Record or with a collection slip with the following information: (Addressograph labels are acceptable and recommended on collection slips)

- First name
- Last name
- Gender
- First line of address
- Date of Birth
- Hospital number (NHS Number)
- Location (e.g. Ward)

The details on the collection slip (or patient's notes), the traceability label and the bag identifier must be checked against the Blood Transfusion Issue Record when the blood is collected. The Blood Transfusion Issue Record must be signed and the time and date the blood was taken recorded. Units of blood should be taken one at a time from the satellite fridge, as they are required. The team member collecting the blood must ensure the 'cold chain' audit trail is complete before use, if in doubt the BTL must be informed. Care should be taken to ensure that the fridge door is properly shut after blood has been removed.

Blood unused on the day of request will be returned to the BTL by staff at the end of the working day or the following morning, together with the Blood

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Transfusion Issue Record, as defined in the Service Level Agreement (SLA) for the satellite fridge.

In the event of the fridge alarm sounding or other fridge failure, the appropriate local protocol should be followed immediately. In case of any doubt, or if the reason for the fridge failure is not clear, the BTL must be contacted immediately.

Any clinical area with a satellite fridge is expected to comply with the relevant SLA, Standard Operating Procedures and Blood and Component Transfusion Policy. Compliance to the relevant agreements and procedure/policy documents will be audited. It is imperative that clinical areas responsible for a satellite fridge understand the importance of compliance to the BSQR (SI 2005 No. 50 as amended)⁽⁴⁾, and appreciate the impact of non-compliance to the Regulations.

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Appendix 12 – Refusal of Blood/Components and Products

Some patients may prefer to be treated without the use of blood components and products. This may either be due to personal preference relating to public health concerns or religious convictions, i.e. Jehovah's Witnesses.

A competent adult (ie. a person aged 16 years and over) with capacity has the right to refuse medical treatment. If the decision to refuse treatment appears to have been made with undue influence or if the patient is a child ('Gillick competent' or not) advice should be sought. Refer to the Consent Policy.

If the patient (aged 18 years and over) has made a valid and applicable advance decision to refuse blood products, and then loses capacity, the advance decision will be legally binding on staff

It must be communicated widely to appropriate members of the healthcare team once it is known that a patient prefers not to, or refuses to, be treated with blood components and products , or if the patient has made an advance decision.

A comprehensive discussion about the patient's wishes must take place and be documented fully in the medical records. This must include information specifically as to what the patient will accept and refuse. Documentation must also include clarity as to the circumstances in which the patient wishes their refusal to apply.

Good communication and planning are essential in the management of such patients. Alternatives to blood transfusion, strategies to minimise blood loss and appropriate management of anaemia must be instigated in a timely manner if they are acceptable to the patient and appropriate to the patient's clinical condition.

Further advice and support for patients may be available from the Hospital Liaison Committee for Jehovah's Witnesses. Contact details are available from the Transfusion Practitioner or the BTL or switchboard.

The Hospital Liaison Committee for Jehovah's Witnesses has circulated information folders to clinical areas, spare copies of which are available from the Transfusion Practitioner. Included in the folder is a copy of the advance decision document which will facilitate the understanding between the clinician and the patient as to which treatment they consent to.

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PATIENTS WHO LACK CAPACITY TO CONSENT TO TREATMENT

Where patients aged 16 years and over lack capacity to consent to or refuse treatment, the Mental Capacity Act 2005 and its accompanying Code of Practice must be followed.

Staff need to be aware that any patient (aged 18 years and over) may have

- Made an advance decision to refuse blood or blood products
- made a Lasting Power of Attorney, giving another person (or persons) the power to take decisions about treatment
- a Court appointed Deputy (although this is rare) with the power to take decisions about treatment

For further information about the Mental Capacity Act, please see the Mental Capacity page on the intranet.

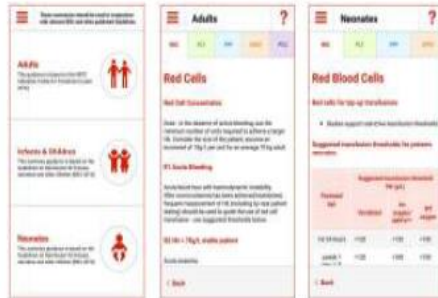
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Appendix 13 Blood Components Apps Available for download



The Blood Component Indication App summarises relevant national transfusion guidelines for adults, children and neonates.

Developed by the NHS Blood and Transplant, to act as a prompt to facilitate appropriate use of blood components and assist with the use of indication codes.



The App is available to download free on Apple and Android devices by searching 'blood components' on App store or Google Play.



The Special Requirements for Transfusion decision support tool provides information on patients groups that have special transfusion requirements (irradiated, CMV-), in line with current published recommendations.

Developed by learnPro Ltd., you will need you a learnbloodtransfusion (learnPro) login username and password to open this App.



The App is available to download free on Apple and Android devices by searching 'learn blood' on App store or Google Play.

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Download the SHOT App!

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- Stay informed and receive the latest messages and news
- Access the latest Annual SHOT Report (including individual chapters)
- Access all current resources including Videos, SHOT Bites, previous Annual SHOT Reports, Participation Data and Reporting Guidance
- Access the Annual SHOT Symposium by clicking on the Installed Events tab
- Access the event programme, posters and faculty list

Any questions? Don't hesitate to contact us!
shot@nhsbt.nhs.uk

How to download:

The easiest way to download our mobile app is to scan one of these barcodes.

You can also search for **'SHOT UK'** in the Apple App Store or Google Play Store.




<https://apps.apple.com/gb/app/shot-uk/id1534545119>




<https://play.google.com/store/apps/details?id=cc.conferences.shot>

After downloading the app, don't forget to enable push notifications to stay up-to-date on the latest happenings and important news!

App powered by  Conference Compass

LIST OF ABBREVIATIONS

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APTT – Activated partial thromboplastin time

BSH – British Society for Haematology

BSQR – Blood Safety and Quality Regulations

BTL – Blood Transfusion Laboratory

CMV neg – Cytomegalovirus negative

FBC – Full Blood Count

FFP – Fresh Frozen Plasma

GMP – Good Manufacturing Practice

HLA – Human Leucocyte Antigen

HTT – Hospital Transfusion Team

MHRA – Medicines and Healthcare products Regulatory Agency

NHS – National Health Service

NPSA – National Patient Safety Agency

PT – Prothrombin Time

QMS – Quality Management System

RhD – Rh D antigen

SPN – Safer Practice Notice

UHB – University Health Board

WBS – Welsh Blood Service

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