

Blood Transfusion

Imtiaz Ali

Blood Transfusion Practitioner

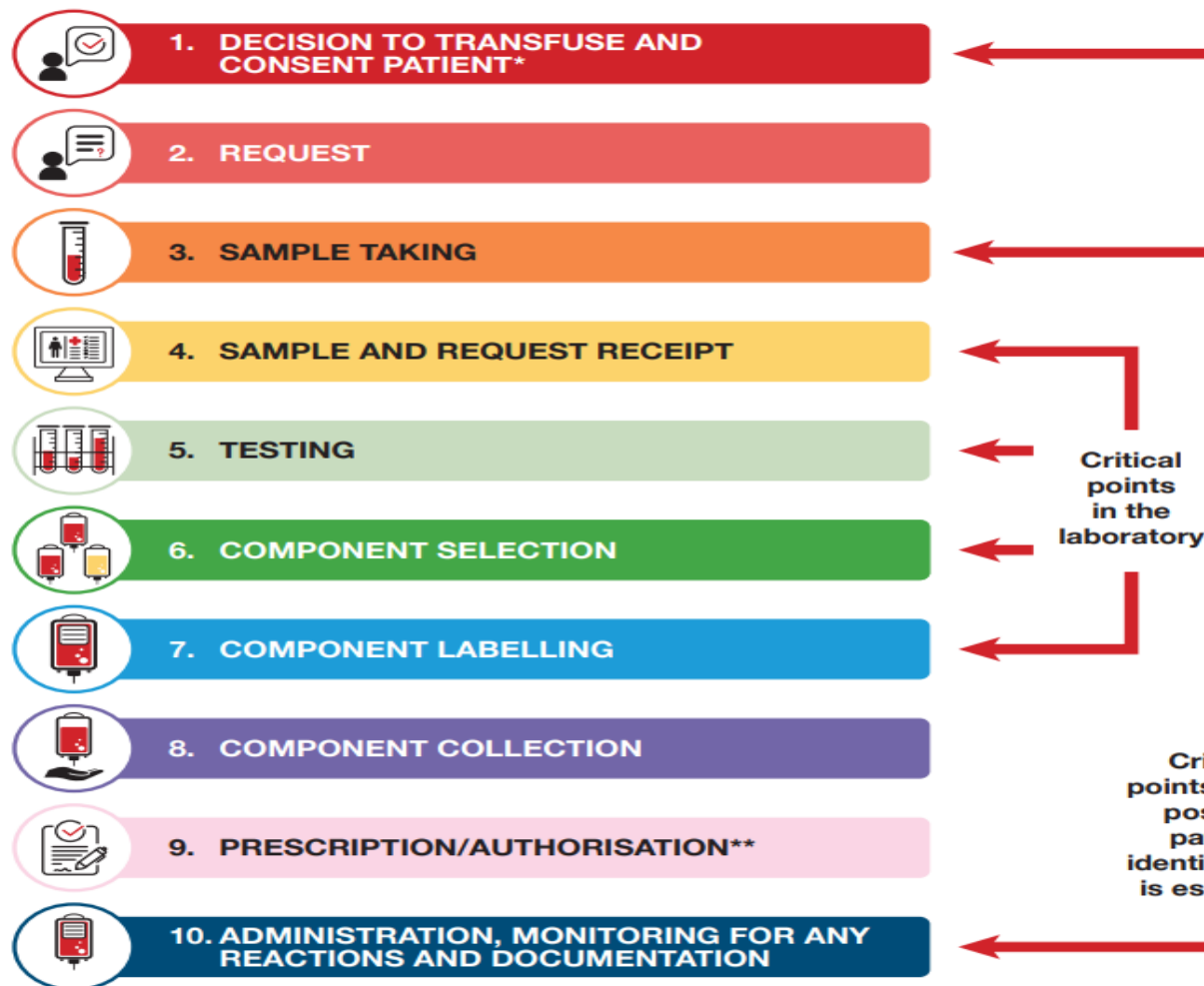


Aims



- Transfusion process at BTH
- Transfusion reactions
- Massive Transfusion Protocol

Ten steps in transfusion



**Note that the pre-transfusion sample may have been taken in advance (for e.g. pre-op) while the decision to transfuse is made at a later date.*

***Once the decision to transfuse has been made, the prescription/authorisation may be written at variable times during the sequence but must be checked at the final stage.*

Staff are encouraged to use the SHOT Safe Transfusion Checklist with every transfusion episode.

Misidentification of patients is a significant cause of avoidable harm. Patient identity must be verified effectively and accurately at every step in the transfusion pathway. All staff must be aware of the importance of correct patient identification and this must be confirmed in accordance with local policies.

Critical points in the laboratory

Critical points where positive patient identification is essential



**1. DECISION TO TRANSFUSE AND
CONSENT PATIENT***

Consent for blood transfusion

Guidance:

- Explain the risks and benefits, allowing time to answer questions.
- Wherever possible consider/offer your patient an alternative.
- Wherever possible gain informed verbal consent.
- Inform your patient how the risks are mitigated.
- Give your patient the appropriate patient information leaflet/s.

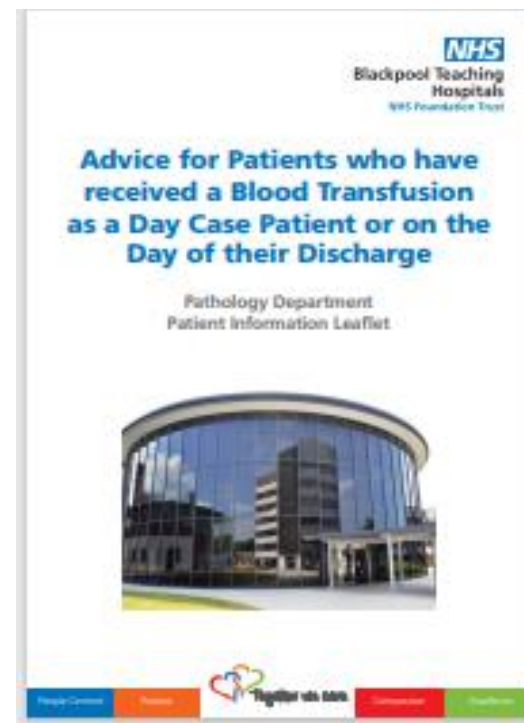
Important information

Patients who have received a blood component since 1980 are not eligible to be blood donors.

Remember

Your patient has the right to refuse a blood transfusion.

Leaflets



What are the benefits
of my transfusion?



What are the risks of
my transfusion?



Any alternative
treatments I can try?



What if I do
nothing?



BLOOD TRANSFUSION PATHWAY – ADULT

(This pathway is to be used for all prescribed blood products)

Abbreviations used in this document to be listed here with the full description:

Hb – Haemoglobin
I.D – Identification
IV – Intravenous
O – Oral
BP – Blood Pressure
DOB – Date of Birth
Resp – Respiration
TACO – Transfusion Associated Circulatory Overload

AVPU – Awake or sleeping naturally responds to Verbal stimulus
Only responds to Pain
Unresponsive

Ward:
Consultant:
Drug sensitivities / alerts:



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NHS Foundation Trust

FILE IN SECTION 4

Write patient details or affix Identification label

Hospital Number:
Name:
Address:

Postcode:
Date of Birth:
NHS Number:

ACCOUNTABILITY SECTION

The box below enables staff using the pathway document to sign their name and indicate the method by which they will initial/sign entries within the document.

All Staff must print full name; sign using the signature/initials to be used throughout the document and then sign the entry with your normal signature.

Printed name	Designation (E.g. DR, SN)	Signature / Initials to be used	Printed name	Designation (e.g. DR, SN)	Signature / Initials to be used

Prescription - This prescription must be completed by a Medical Practitioner

Indication for Transfusion	Hb level	Clinical
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Date of Transfusion	Preparation Blood	Dose	Infusion Time (Recommended)	Infusion Time (Alternative)	Route	Prescribed by
			2-3 hours		IV / Central	
			2-3 hours		IV / Central	
			2-3 hours		IV / Central	
			2-3 hours		IV / Central	
					IV / Central	
					IV / Central	
					IV / Central	
					IV / Central	
					IV / Central	
Time						Sign:

The above infusion rates are for guidance only. Clinicians may feel that these are not appropriate for the clinical situation. Alternative infusion rates can be entered into the appropriate column. Expected maximum transfusion time 4 hours per unit of blood. Required medications must be recorded on a Trust prescription sheet. Any variations and notes can be found at the back of the pathway.

All patients requiring blood products will require two group and screen samples to be taken at separate times in order to verify the patient's correct blood type. Unless there is an existing historical blood group record when an in date second sample will be required. V5943 (R4) 02, 14

Does the patient (or if applicable: parent/guardian/carer) understand who their health record information may be shared with? Yes / No

Signature:

Designation:

Print Name:

Date and Time (use 24hour Clock):



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Prior to collecting Blood product - Pre Transfusion checklist

Interventions	Signature
Patient informed of need for transfusion	
Has patient received information leaflet	If No please give leaflet
Verbal consent for transfusion given	(Prior to each transfusion)
Ensure patient has I.D. band on prior to transfusion	(Prior to each transfusion)
Ensure IV access gained	
Record baseline observations (pg 3)	(Prior to each transfusion)
Discuss the requirement for diuretic therapy.	
<i>Unconscious patients please refer to the Trust blood & blood component administration procedure CORP/PROC/190 section 3.6.1</i>	
<i>Oncology patients – refer to RMCH Oncology blood product transfusion protocol</i>	

***Collect Blood product from laboratory following trust procedure – formal patient ID is required
IE: Completed blood collection slip***

Intra - Transfusion

Interventions – applicable for each unit / blood product transfused
<i>Check Blood product against prescription and patient at bedside as per Trust procedure</i>
Perform TACO risk assessment (see page 3)

Transfusion 1	
Surname	
Forename	
D.O.B	
Hospital Number:	
Unit Number:	
Blood Group	
Collected by	
Given by	
Start	Date: Time:
End	Date: Time:
TACO checklist completed	Date: Time: TACO risk: YES / No (circle)
TACO risk Action taken (circle)	Diuretic prescribed / Monitor SpO2/ weight adjusted red cell dose / fluid balance / single unit red cells then review
Name:	Grade: Date:

Transfusion 2	
Surname	
Forename	
D.O.B	
Hospital Number:	
Unit Number:	
Blood Group	
Collected by	
Given by	
Start	Date: Time:
End	Date: Time:
TACO checklist completed	Date: Time: TACO risk: YES / No (circle)
TACO risk Action taken (circle)	Diuretic prescribed / Monitor SpO2/ weight adjusted red cell dose / fluid balance / single unit red cells then review
Name:	Grade: Date:





2. REQUEST

Blood Request Card Mandatory Fields

PLACE SPECIMEN IN BAG FOLD TOP OVER TO SEAL REMOVE COVERING STRIP	FOLD DIRECTORATE OF PATHOLOGY BLACKPOOL TEACHING HOSPITALS NHS FOUNDATION TRUST	Please print clearly using ball point pen or clearly printed addressograph label <small>Version 5 - 2021</small>		TRANSFUSION LAB Tel 953746 / 953747		FOR LABORATORY USE ONLY			
		Hospital No. 123456	Group & Screen Only <input type="checkbox"/>	Confirmed Group					
		NHS No. 012 345 6789	Group & Crossmatch <input checked="" type="checkbox"/>	ABY/DCT Pos					
		Surname SMITH	Direct Coombs test <input type="checkbox"/>	< 12 Weeks solid Organ Transplant					
		Forename JOHN	Foetal cell count <input type="checkbox"/> Routine <input checked="" type="checkbox"/> Urgent <input type="checkbox"/> Private <input type="checkbox"/> (Urgent confirm with lab by phone)	IRRADIATED					
		Date of Birth 01/01/1970 Sex M / F MALE	Product (Adults number of units, Paediatric/Neonatal number of mLs)	Previous Reaction					
		Address <small>Address not required for wrist banded patients</small>	RED BLOOD CELLS	Kell Neg / CMV Neg					
		Town Post Code	Quantity 1	Sample In Date					
		Consultant Ward A&E	Date & Time Required 20/04/2019 09:00	Electronic X-Match	Yes / No	Yes / No			
		Diagnosis / ANAEMIA	If Irradiated Required Circle YES	Staff Initial					
Surgical procedure	HISTORY		Specimen & request card details checked in laboratory		Initial				
Requesting Drs/Practitioners Sign Bleep No. Dr K. Higgins	Transfusions in last 3 months Yes No	Group							
R Code Indication	Reactions Yes No								
I confirm I have checked and verified the Patient I.D.	If FEMALE								
Sample taken by:	No. pregnancies.....								
Print Name SIMON JONES	Pregnant within the last 3 months Yes / No								
Signature S Jones	Anti-D immunoglobulin administered in the previous 12 weeks Y / N Date Given:								
Bleep No.:	Known haemoglobinopathy Y / N								
Date: 18 / 04 / 2019 Time: 13:30	Known antibodies / antibody card? (if known)								

Blood Request Card Mandatory Fields

D TOP OVER TO SEAL	FOLO FOUNDATION TRUST	Please print clearly using ball point pen or clearly printed addressograph label <small>Version 5 - 2021</small>		TRANSFUSION LAB Tel 953746 / 953747		FOR LABORATORY USE ONLY		
		Hospital No. 123456	Group & Screen Only <input type="checkbox"/>		Confirmed Group			
		NHS No. 012 345 6789	Group & Crossmatch <input checked="" type="checkbox"/>		ABY/DCT Pos			
		Surname SMITH	Direct Coombs test <input type="checkbox"/>		< 12 Weeks solid Organ Transplant			
		Forename JOHN	Foetal cell count <input type="checkbox"/>		IRRADIATED			
Date of Birth 01/01/1970 Sex: M / F MALE	<input type="checkbox"/> Routine <input type="checkbox"/> Urgent <input type="checkbox"/> Private (Urgent confirm with lab by phone)		Previous Reaction					

2-Sample Rule

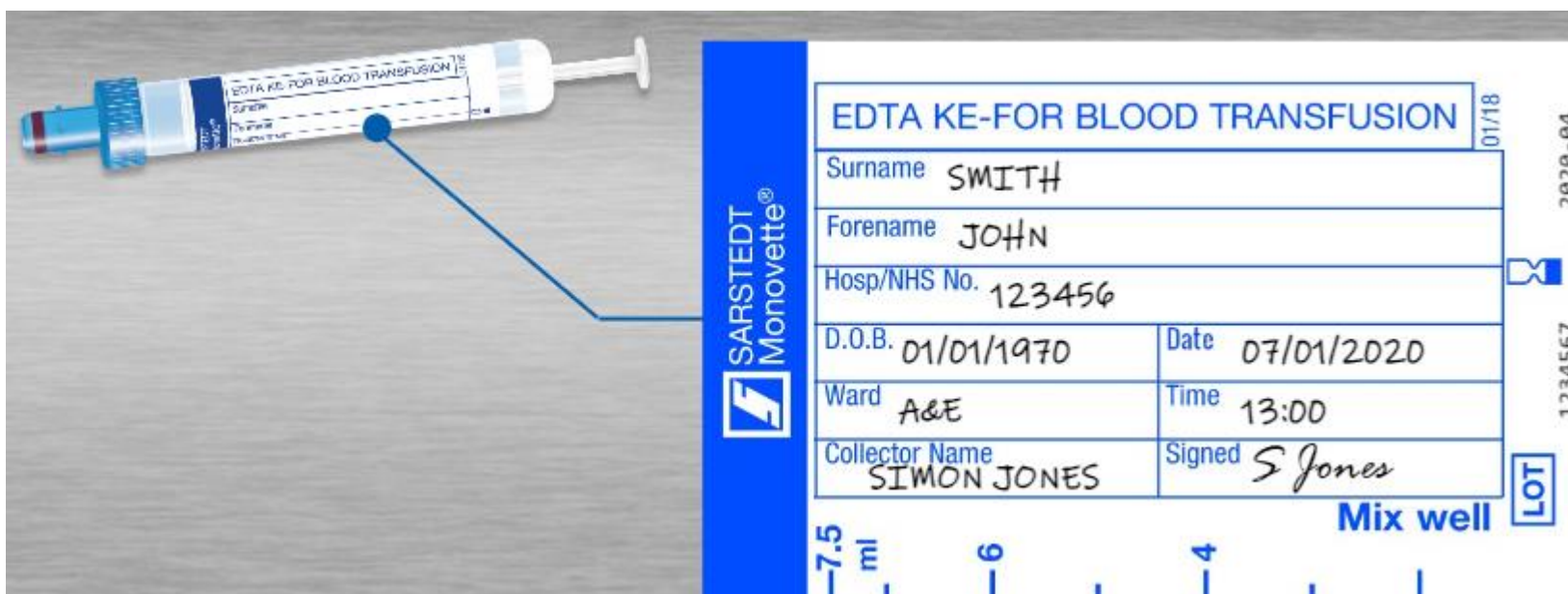
All patients' requiring blood products will require two group and screen samples to be taken at separate times in order to verify the patient's correct blood type. Unless there is an existing historical blood group record when an in date second sample will be required

REMOVE COVERING STRIP	DIRECTOR BLACKPOOL TEACHING	Requesting Drs/Practitioners Sign Bleep No. <i>Dr K. Higgins</i>	Transfusions in last 3 months Yes / No Yes / No	Group	
		R Code Indication	Reactions		
		I confirm I have checked and verified the Patient I.D.	If FEMALE		
		Sample taken by:	No. pregnancies.....		
		Print Name SIMON JONES Signature <i>S Jones</i> Bleep No.: Date: 18 / 04 / 2019 Time: 13:30	Pregnant within the last 3 months Yes / No Anti-D immunoglobulin administered in the previous 12 weeks Y / N Date Given: Known haemoglobinopathy Y / N Known antibodies / antibody card? (if known)		

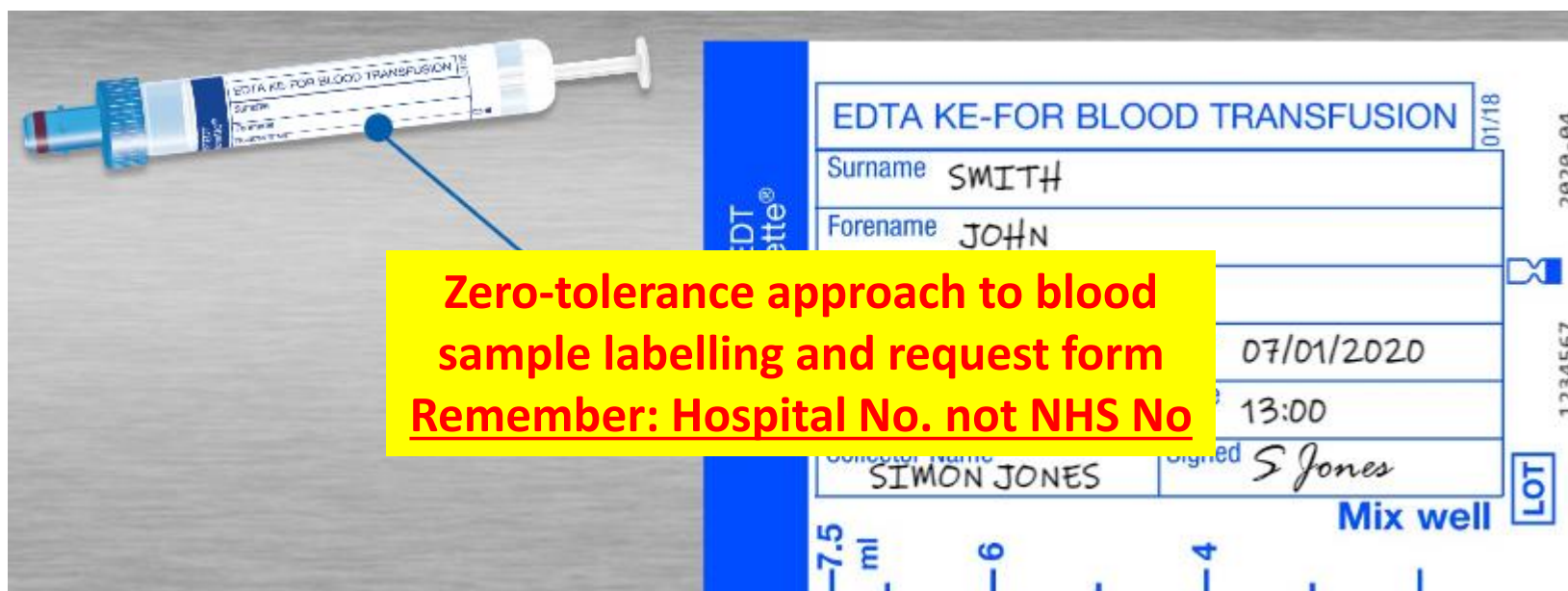


3. SAMPLE TAKING

Blood Transfusion Sample



Blood Transfusion Sample



Sample taking

- Positive patient identification
- Samples **MUST** be labelled at the bedside
- Unlabelled samples must **NOT** leave the **SAMPLE CIRCLE**



All samples must be labelled at the patient side
using positive patient identification.

Unlabelled blood samples **MUST NOT** leave the **SAMPLE CIRCLE**.

Unlabelled blood samples outside the circle should be disposed of.



4. SAMPLE AND REQUEST RECEIPT



5. TESTING



6. COMPONENT SELECTION



7. COMPONENT LABELLING



8. COMPONENT COLLECTION



9. PRESCRIPTION/AUTHORISATION**

Prescription - This prescription must be completed by a Medical Practitioner

Indication for Transfusion	Hb level	Clinical
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Date of Transfusion	Preparation Blood	Dose	Infusion Time (Recommended)	Infusion Time (Alternative)	Route	Prescribed by
			2-3 hours		IV / Central	
			2-3 hours		IV / Central	
			2-3 hours		IV / Central	
			2-3 hours		IV / Central	
					IV / Central	
					IV / Central	
					IV / Central	
					IV / Central	
Time	hours cross match sample / form sent to lab or lab phoned to act on Group and Save					Sign:



**10. ADMINISTRATION, MONITORING FOR ANY
REACTIONS AND DOCUMENTATION**

Observations	Date	Time	B.P.	Pulse	Temp	Resp Rate	SpO2	AVPU	Signed
Transfusion 1 Baseline – Observations									
Observations 15 minutes post commencement									
Observations 1/2 hour post transfusion									
Transfusion 2 Baseline – Observations									
Observations 15 minutes post commencement									
Observations 1/2 hour post transfusion									
Transfusion 3 Baseline – Observations									
Observations 15 minutes post commencement									
Observations 1/2 hour post transfusion									



Transfusion reactions

All transfusion episodes must be monitored for signs of reaction, which can occur within minutes, hours, days or weeks of transfusion.

You will be asked to review patients during potential transfusion reactions

Transfusion reactions

Clinical Symptoms & Signs: fever, chills, rigors, tachycardia, hyper- or hypotension, collapse, flushing, urticaria, respiratory distress, nausea, malaise, pain (bone, muscle, chest, abdominal)

STOP TRANSFUSION (UNLESS HAEMORRHAGE): ARE THE SYMPTOMS & SIGNS LIFE-THREATENING?

YES – SEVERE reaction

**DISCONTINUE TRANSFUSION
EMERGENCY CALL
START RESUSCITATION
MONITOR VITAL SIGNS, O₂ SATURATION, URINE OUTPUT**

anaphylaxis/
severe allergy

Follow local anaphylaxis pathway

non-anaphylactic
respiratory compromise

See appendix 5

suspected bacterial
contamination of unit

See appendix 2

suspected acute haemolytic
transfusion reaction

See table 1

Retain blood unit(s), report to transfusion laboratory, diagnostic investigations (table 1), report to SHOT/MHRA

NO

MODERATE
≥39°C (or ≥ 2°C rise)
Symptoms/ signs other than pruritus/rash

MILD
<39°C (or <2°C rise)
With or without rash/pruritus

MEDICAL REVIEW

INFORM MEDICAL STAFF

Take into account underlying clinical condition

Consider symptomatic treatment (see text)
If symptoms settle, **resume transfusion**
More frequent monitoring of vital signs

Continue transfusion
Consider symptomatic treatment (see text)
More frequent monitoring of vital signs

Worsening/ persistent symptoms out of keeping with underlying condition – manage as for Severe reaction

Worsening – manage as for Moderate/Severe reaction

If symptoms and signs are determined **not transfusion-related**, or in the case of a **mild reaction**: document in medical notes. Not SHOT/MHRA reportable

Use this section to document any observations when an adverse reaction is observed.

Date																			
Time																			
Blood pressure																			
Pulse																			
Temp																			
Respiratory rate																			
AVPU																			
Transfusion no:																			

**TRANSFUSION REACTION REQUEST
FOR INVESTIGATION**

TO BE COMPLETED IN THE EVENT OF AN ACUTE OR SUSPECTED DELAYED TRANSFUSION REACTION

PLEASE NOTE: Pyrexia (alone) < 2 degrees Celsius from baseline temperature is not reportable as a transfusion reaction.

In the event of a reaction following the transfusion of blood or blood components, alert the Hospital Transfusion Laboratory immediately or the duty Haematology Doctor on call. Refer to the trust blood administration policy and treatment flow [chart](#)

Complete the following and return to the Hospital Transfusion Laboratory as soon as possible, together with:

1. Post transfusion samples: 1 tube of clotted blood 7.5 ml and two tubes of 7.5 EDTA blood, both fully hand labelled
2. Fully completed request cards for 1 tube of clotted blood and two tubes of 7.5 EDTA blood.
3. **PLEASE NOTE:** Sample tubes and request cards **MUST** be labelled with the patient's hospital number
4. Administration set with transfused unit still attached or indicate suspected unit.
5. Previously transfused units.
6. Any units not transfused.

Please ensure that the administration set and the used unit(s) are enclosed in a sealed container before returning to the Hospital Transfusion Laboratory.

Patients Surname Forename (s) Hospital No.....

Date of Birth: ___/___/___ Hospital (if not Blackpool Victoria) Ward.....

Diagnosis and/or Reason for Transfusion

Blood Product(s) Transfused Volume given..... ml

Transfusion Started: Date ___/___/___ Time ___:___ Reaction Occurred Date ___/___/___ Time ___:___

Reaction Reported: Date ___/___/___ Time ___:___

Symptoms (3)	Pyrexia	<input type="checkbox"/> (Baseline temperature) (Pyrexia temperature)	Hypotension	<input type="checkbox"/>
	Shock	<input type="checkbox"/>	Urticaria or Rash	<input type="checkbox"/>	Chest Pain	<input type="checkbox"/>
	Cyanosis	<input type="checkbox"/>	Jaundice	<input type="checkbox"/>	Loin / Lumbar Pain	<input type="checkbox"/>
	Tachycardia	<input type="checkbox"/>	Chills / Rigors	<input type="checkbox"/>	Nausea	<input type="checkbox"/>
	Dyspnoea	<input type="checkbox"/>	Sweating	<input type="checkbox"/>	Anxiety	<input type="checkbox"/>
	Flushing	<input type="checkbox"/>	Bleeding	<input type="checkbox"/>	Oedema / Angioedema	<input type="checkbox"/>

Others:

Treatment Given: Outcome(s):

Previous Transfusions: Previous Reactions:

Pregnancies: Known Antibodies:

Is more blood required YES / NO. If YES please specify:





Is the patient on any medication? If YES please specify:

Batch or code number of suspect unit/s

Medical Officers Signature..... Date ___/___/___ Bleep No.....

TACO

- TACO is a respiratory complication of transfusion
- “Acute or worsening respiratory compromise... and/or pulmonary oedema... up to 12 hours post transfusion”
- TACO is preventable with correct mitigations and interventions
- Causes major morbidities, admission to CRCU and ultimately **death**

TACO Checklist	Red cell transfusion for non-bleeding patients	If 'yes' to any of these questions	
	<p>Does the patient have a diagnosis of 'heart failure' congestive cardiac failure (CCF), severe aortic stenosis, or moderate to severe left ventricular dysfunction?</p> <p>Is the patient on a regular diuretic?</p> <p>Does the patient have severe anaemia?</p>		<ul style="list-style-type: none"> • Review the need for transfusion (do the benefits outweigh the risks)?
	<p>Is the patient known to have pulmonary oedema?</p> <p>Does the patient have respiratory symptoms of undiagnosed cause?</p>		<ul style="list-style-type: none"> • Can the transfusion be safely deferred until the issue can be investigated, treated or resolved?
	<p>Is the fluid balance clinically significantly positive?</p> <p>Is the patient on concomitant fluids (or has been in the past 24 hours)?</p> <p>Is there any peripheral oedema?</p> <p>Does the patient have hypoalbuminaemia?</p> <p>Does the patient have significant renal impairment?</p>		<ul style="list-style-type: none"> • 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

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.

Single-Unit Transfusion Policy for Red Cell Transfusion

- Prescribe **ONE** unit of blood for stable and normovolemic in-patients that are **NOT** actively **bleeding**

Reassess the patient before transfusing another unit

Every unit is a **New Clinical Decision**

Don't transfuse more, if the patient's symptoms settle

Base your decision on **symptoms**, not only on the patients haemoglobin level

Massive Transfusion Protocol

Ward / Departmental Management

- Allows rapid and appropriate response to major haemorrhage
- Opens a channel of direct and immediate contact between the clinical area and laboratory
- Provide quick and effective delivery of blood components to patient
- Can occur on any ward so all staff must be aware of protocols and their potential role

Patient identified on the ward / clinical area with massive haemorrhage:

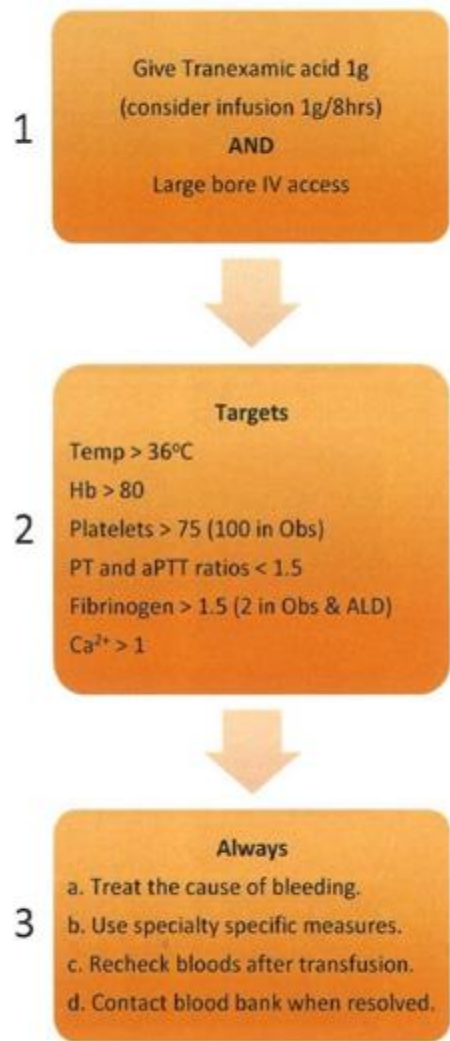
Take the following action:

- If the parent team clinician is not in attendance call via switchboard on fast bleep state 'Massive Haemorrhage' and your location
- Either the attending clinician or a designated staff member will activate the Massive haemorrhage Protocol (MHP) by dialling 2222 - state 'Massive Haemorrhage' activate the Massive Transfusion Team (TEAM 5) and your location
- This will activate the massive Transfusion team consisting of the following personnel - The Massive Transfusion co-ordinator, the duty Porter and the blood transfusion laboratory Biomedical Scientist (BMS)

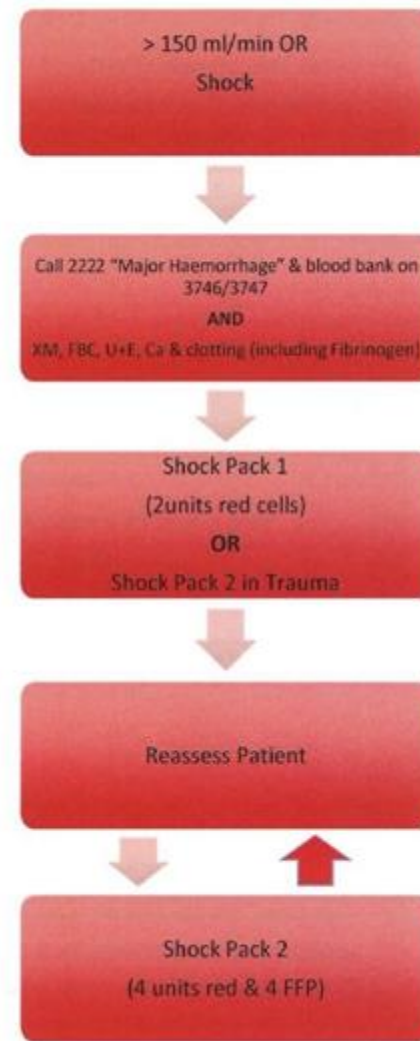
The person activating the (MHP) will contact Blood Bank on 53746/ 53747 / bleep 109 or mobile communication and relay the following information:

- Name and contact telephone number, name of consultant responsible
- Patient ID (surname, forename, hospital number, DOB or minimum acceptable patient Identifiers if unknown)
- Confirm with the laboratory if there is an in-date transfusion sample and if not arrange for a new (correctly labelled) sample to be taken and URGENTLY sent to Blood Bank
- Confirm if flying squad blood is required
- Order Shock Pack 1
- If not already present the ward must inform via switchboard on 2222 the parent consultant in charge of the patient's care or on call consultant.
- On the arrival through the activation of the massive transfusion team 2222, the designated transfusion co-ordinator or shift leader will at the location contact the Porter for the URGENT collection from the Blood Bank of Shock Pack 1 (SP 1) if ready for collection or 2 units of O negative flying squad blood if (SP 1) not yet available. Request that a dedicated porter be available throughout the management of the incident until stand-down has been called
- If the parent team clinician is not in attendance the Transfusion Coordinator will triage the patient and decide which clinical speciality to call to attend

Major Haemorrhage



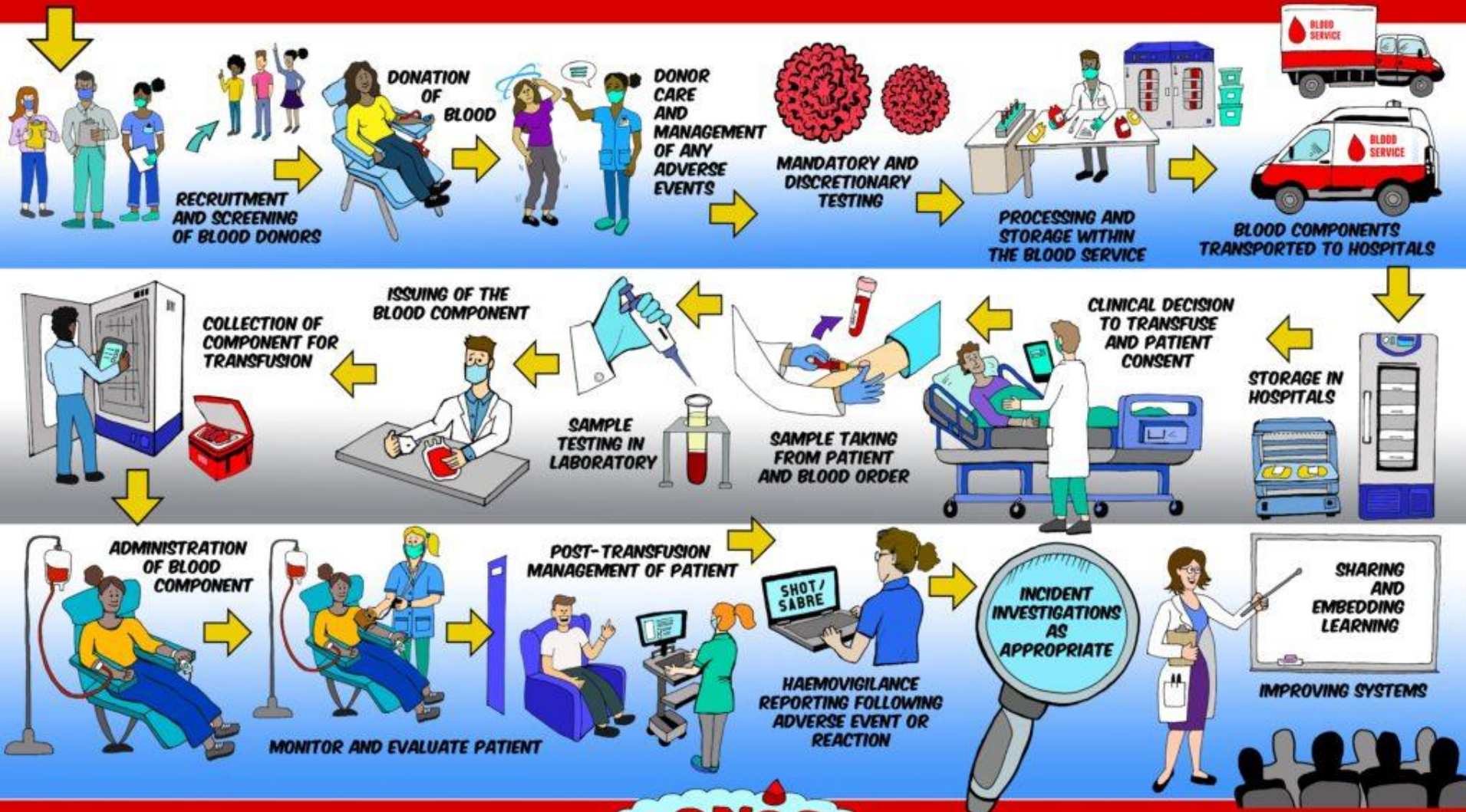
- Contact senior members of parent team.
- Early use of TXA reduces blood loss.
- Give Vitamin K and PCC in warfarinised patient.
- Give Cryoprecipitate (2 packs) to treat low Fibrinogen levels. **Consider early use of Cryo in obstetric haemorrhage.**
- Prevent hypothermia with fluid warmers and warming blankets.
- Use cell salvage (+TXA) if available.
- Move directly to SP2 in trauma (or if clinically indicated), and request platelets.
- Give 10mmol Calcium Chloride for hypocalcaemia.
- In addition to clinical examination, reassessment of patients should include repeat bloods, ABGs and TEG/ROTEM (if available).
- **When resuscitation has concluded, contact blood bank to "STAND DOWN" on 3746/3747.**



HAEMOVIGILANCE: VEIN TO VEIN

SHOT
Serious Hazards
of Transfusion

HAEMOVIGILANCE COVERS THE ENTIRE VEIN TO VEIN TRANSFUSION CHAIN AND IMPROVES PATIENT SAFETY



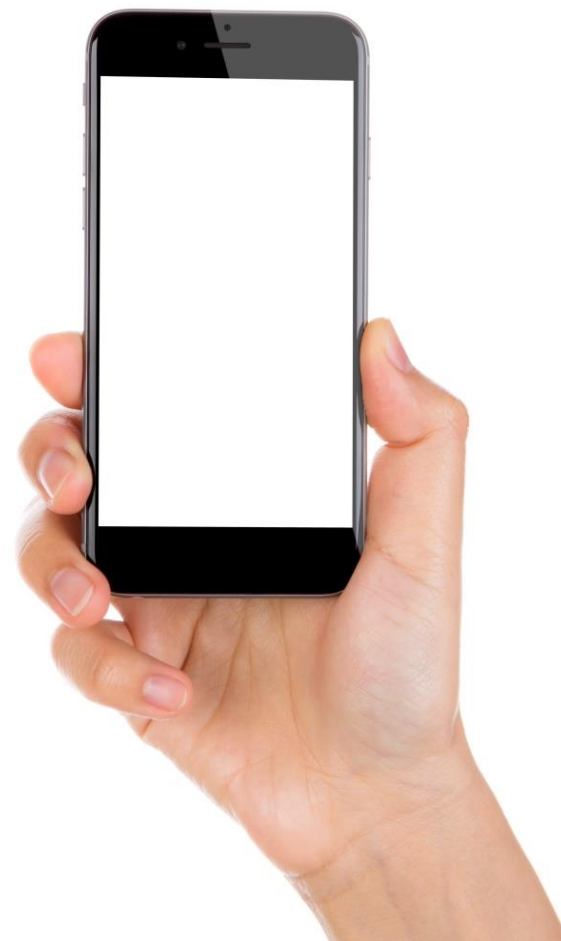
TRACEABILITY
AND COLD
CHAIN
COMPLIANCE

**DONOR
TO
RECIPIENT**

ILLUSTRATION:
JENNY
LEONARD
ART

Further info...

- Policies (Document library / Intranet)
- BSH Transfusion Guidelines
- JPAC Transfusion Guidelines
- NHSBT and SHOT resources including Apps
- NICE Guidelines
- Trust Guidelines
- MHP Flowcharts
- Relevant medical organisations;
 - Association of Anaesthetists
 - Royal College of Obstetricians and Gynaecologists
 - Royal College of Surgeons



Contact Details

- Imtiaz Ali
 - email: Imtiaz.ali5@nhs.net
 - ext: 55456
 - bleep: 1813

