Worcestershire Acute Hospitals NHS Trust

Administration of Blood Components and Management of Transfusion Reactions

Department / Service:	Blood Transfusion, Pathology.
Originator:	Trust Transfusion Team
Accountable Director:	Dr Sangam Hebballi Consultant Haematologist
Approved by:	Trust Transfusion Committee Clinical Governance Group
Date of approval:	7th November 2023
Review date: **This is the most up to date document and should be used until a revised version is in place:**	7th November 2026
Target Organisation(s)	Worcestershire Acute Hospitals NHS Trust Worcestershire Health & Care Trust
Target Departments	All
Target staff categories	All staff involved in the transfusion process

Introduction

This procedure details the preparation required for the administration of a transfusion of blood/blood products to an individual who has been identified as requiring them.

This includes correctly identifying the patient and confirming that administration documentation is accurate, legible and complete. It also involves explaining the process and obtaining patient consent.

The procedure involves supporting and monitoring the patient throughout the transfusion procedure, identifying and responding promptly to indications of adverse reactions, completing relevant documentation and disposing of used blood bags and other used equipment on completion.

This procedure is relevant to anyone required to carry out this activity, to support safer blood transfusion by ensuring the correct blood component or product is given to the correct patient.

This guideline is for use by the following staff groups:

All staff involved in the process of transfusion administration

Key amendments to this guideline

Date	Amendment	Approved by:
June 2018	Inclusion of the new blood transfusion care pathway including prescription and transfusion associated overload checklist	Gill Godding
July 2020	Document extended for 6 months whilst review and approval takes place	Gill Godding
February 2021	Document extended for 6 months as per Trust agreement 11/02/2021	Trust agreement
July 2021	Minor amendments to contents and the treatment and management of transfusion reactions	Gill Godding
7th November 2023	Document reviewed and approved for 3 years	Laura Walters

Contents Page

1. Introduction

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The process also involves supporting and monitoring the patient throughout the transfusion procedure, identifying and responding promptly to indications of adverse reactions, completing relevant documentation and disposing of used blood bags and other used equipment on completion.

This procedure is relevant to anyone required to carry out this activity to support safer blood transfusion by ensuring the correct blood or product is given to the correct patient.

All staff including prescribers involved in the transfusion process are required to successfully complete mandatory training in blood transfusion.

2. Preparing the patient for transfusion

Transfusion should only occur in well-lit areas where the patients can be readily observed. Overnight transfusions must be avoided unless the patient is severely symptomatic. Routine transfusion should occur between 08:00 and 20:00.

The WR1251 Documentation for Transfusion of Blood Components Pathway should be used for all transfusions (operating theatres are the only exception). In the intensive care unit, the prescription and observations should be recorded on the Intensive care unit chart.

The indication for transfusion, patient consent for transfusion and the Transfusion Associated Circulatory Overload (TACO) checklist should be completed before the prescription is written.

The Transfusion Prescription

- Ensure that the TACO checklist is completed prior to writing the prescription
- It is the responsibility of the prescriber to ensure that any special requirements are met, e.g. irradiated, HEV negative, CMV negative, HLA matched platelets, blood warmer.
- Medications related to transfusion (e.g. diuretics, antipyretics) must be prescribed on a medication chart
- A new prescription and TACO checklist should be completed for every new decision to prescribe blood

Diuretics

There may be a risk of precipitating congestive cardiac failure, particularly in patients with chronic anaemia. If it is necessary to transfuse red cells, this risk can be minimised by administering a diuretic (e.g. furosemide 20-40 mg orally) and closely observing the patient**.** The decision to give a diuretic must be based on a clinical assessment of the patient.

Consent for transfusion

If the patient is conscious and able to respond, check that they understand why they require a transfusion and have given informed consent for it.
Patient information leaflets are available in all clinical areas to aid this discussion. Additional leaflets and translations are available on the WAHT intranet - A-Z - Blood transfusion home site.

If the patient is unable to give informed consent, then ensure that the relevant next of kin is aware of the requirement for transfusion. If the patient is a paediatric, ensure the consent of the relevant parent/guardian is obtained. The patient should sign their consent, if able, on the WR1251 Documentation for transfusion of Blood Components

The "Documentation for transfusion of blood components", should be fully completed for every transfusion episode.

Pre transfusion checks

Prior to ordering the blood ensure that the pre transfusion checklist is completed.

The patient must have an identification band in place which specifies the four unique identifiers needed for transfusion:

- Surname, Forename, Date of birth and NHS number
- The patient should have a patent cannula in situ.
- Check ICE to establish if units are available for use
- Perform baseline observations of:

Blood pressure, heart rate, respiratory rate, temperature, conscious level and oxygen saturations to establish an accurate baseline NEWS score.

Providing the patient is stable, the baseline observations can be carried out up to an hour prior to the commencement of the transfusion.

These pre-administration checks must be completed prior to ordering the blood.
See Procedure for Blood Collection and Transfer to Satellite Fridges.

3. Ward Receipt

Arrival on the ward/clinical area

- When blood is delivered to a ward or department, it must be handed to an appropriately qualified member of staff who will check that the correct blood has been delivered and will sign the blood bag to accept receipt of the blood component.

Care of Blood prior to Transfusion

- Transfusion should begin as soon as possible after delivery of the blood unit.
- Once the blood has been removed from the issue fridge it must be completely transfused within 4 hours of removal.

- Blood components must never be disposed of in the clinical area. If the transfusion has not been started within 30 minutes and there is no prospect that it will be completely transfused within the next 3 ½ hours, the pack must be returned to blood bank to be wasted.
- Blood which is being transported in a sealed Transit box (supplied by the laboratory) can be stored for up to 4 hours after removal from the blood bank refrigerator. The box must not be opened until the units are to be transfused or transferred to a satellite fridge. Any unused units must be returned to the blood bank as soon as possible.
- Blood must not be stored in ward refrigerators under any circumstances.
- Medications are not to be added to blood components under any circumstances

4. Administration sets for Transfusion

- Blood will be transfused through a sterile Blood Transfusion giving set with a 170 -200µm filter which is specifically designed for the purpose. Additional filters will not be required.
- Priming the line: The line can be primed with the blood component itself. It is not necessary to prime with normal saline.
- The giving set MUST be changed if the component is changed i.e. from red cells to Platelets.
- Albumin can be transfused through an ordinary giving set with a 15 µm filter
- Special paediatric giving sets must be used for transfusions to infants

Each blood transfusion giving set can only be used for a maximum of 12 hours.

5. Blood Warming

- The decision to warm blood is the responsibility of a doctor and must be documented in the patient's notes. Blood Warmers should be used when a patient is found to have Cold Agglutinins or is having a massive transfusion.
- Blood will only be warmed using a specifically designed commercial device (CE marked) with a visible thermometer and audible warning
- Blood warming devices should only be operated by personnel who have received training and regular updates in their use.

6. Bedside checking procedure

The blood component should be checked at the patient's side by the administrator and a second checker. Each member of staff should complete the checks independently to ensure patient safety.

Patient Identity checks:

Identify your patient by using the formal checklist within the WR1251 Documentation for transfusion of Blood Components

1. Ask you patient to tell you their name and date of birth
2. Compare what they say against the ID band
3. Compare the ID band details of name, date of birth and NHS number against:
   - The prescription
   - The compatibility slip on the unit to be transfused

If there are any discrepancies, DO NOT TRANSFUSE

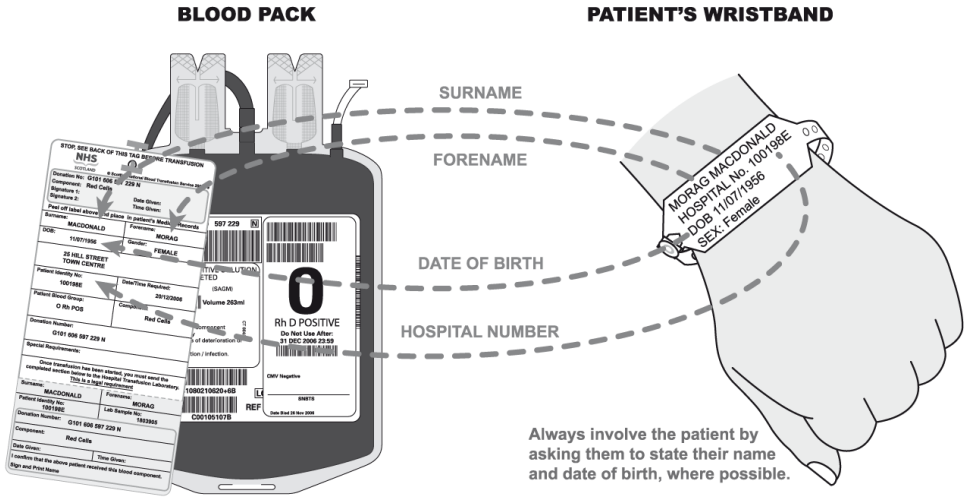
Component checks:

- Check the blood group details on the component matches the compatibility slip
- Check the donor number on the unit against the compatibility slip
- Check the expiry date of the unit
- Check the unit for discolouration, lumps, clots and leaks. If there are any abnormalities, return the unit to the laboratory.
- Check if the patient has any special requirements, and check these against the unit.

Complete the transfusion documentation for each unit transfused, including accountability signatures and bedside checks.

If the blood unit pack is accidentally punctured during the setting up procedure, or not transfused for any other reason, the blood bank must be informed as soon as possible and the unit returned.

<u>The final check should be the compatibility label against the wristband.</u>



7. Administration

- Connect the unit to the administration set using an aseptic non-touch technique
- The administration line should be primed in the presence of the patient once the bedside checks are completed.
- Feed the line into the infusion pump and set at the appropriate rate
- Attach the line to the patient's cannula and commence transfusion.
- Advise the patient about any possible signs and symptoms they may experience and make sure they can reach the call bell.
- Remain with patient for the next 5 minutes to observe for any adverse event which could be linked to ABO incompatibility.

Component	Recommended administration time	Exceptions
Red cells	1 ½ - 3 ½ hours	Massive haemorrhage/Exchange
FFP/Octoplas	10-20 mls/kg/hour	Massive haemorrhage

Platelets	30-60 minutes	Massive haemorrhage
Cryoprecipitate	10-20 mls/kg/hour	Massive haemorrhage

8. Care and monitoring of patients during transfusion

- Severe reaction to a transfusion is most likely to occur within the first 15 minutes of the start of each unit. The patient must be closely observed during this period.
- Patient observations should be repeated 15 minutes from the start of the transfusion. If there is no change from baseline, then no further observations are required during transfusion unless the patient shows signs of an adverse reaction.
- Regular visual checks should be made on the patient to check for signs of transfusion reaction.
- Observations relating to the transfusion should be recorded on the WR2151 Documentation for Transfusion of Blood Components (With the exception of theatres and Intensive care unit where the patient is being continuously monitored. The start time, 15 minute observations and completion of the transfusion should be indicated on the theatre anaesthetic chart or ITU observation chart).
- Transfusion in the operating theatre is the only exception to the use of the WR2151 Documentation for Transfusion of Blood Components. The start of the transfusion is to be documented on the anaesthetic observation chart. The patient must not be transferred from recovery to the ward area without the completion of the WR2151 Documentation for Transfusion of Blood Components.

9. End of transfusion

- Post transfusion observations are to be completed and recorded. These observations can be used as the baseline observations for the next unit, providing it is commenced within an hour.
- Once finished, the empty bag can be disposed of immediately in clinical waste, providing the patient is stable. The compatibility tag must be disposed of in confidential waste, and the traceability tag completed and returned to the transfusion laboratory.
- The transfusion documentation must be filed in the patient's medical notes.
- The doctor should document in the patient notes if there were any adverse events during transfusion as well as if the expected benefits from transfusion had been achieved.
- For day-case patients receiving a blood transfusion, the Post Transfusion Advisory Leaflet should be given to the patient prior to going home, indicating emergency contact numbers in case of a delayed reaction.

Patients should be asked to report symptoms which develop within 24 hours of completion of the transfusion to the ward area where they were transfused.

10. Acute transfusion reactions

Signs and symptoms of an acute transfusion reaction

Acute transfusion reactions can present with a range of signs and symptoms of varying severity.

Mild transfusion reactions (1= mild) do not need to be reported to the laboratory.

	1 = Mild	2 = Moderate	3 = Severe
	A rise in temperature of 1-2°C from baseline values *or* a fever >38°C (with or without a rash)	A rise in temperature of >2°C from baseline *or* a fever >39°C *and/or* rigors, chills, and other inflammatory symptoms (such as myalgia) or nausea which requires prompt medical review	A rise in temperature of >2°C *and/or* rigors, chills, or fever >39°C *or* other inflammatory symptoms (such as myalgia) or nausea which requires prompt medical review *and/or* directly results in, or prolongs hospital stay.
Allergic type reaction	Transient flushing, Urticaria (hives) or rash (with or without mild temperature rise)	Wheeze or angioedema *with or without* flushing/urticaria/rash *without* respiratory compromise or hypotension	Bronchospasm, stridor, angioedema or circulatory problems which require urgent medical intervention *and/or* directly result in or prolong hospital stay *or* **Anaphylaxis** (severe, life-threatening, systemic hypersensitivity reaction with rapidly developing airway and/or breathing and/or circulation problems)
Reaction with both allergic and febrile features	Features of both mild febrile *and* mild allergic reactions	Features of both allergic *and* febrile reactions, *at least one of which is in the moderate category.*	Features of both allergic *and* febrile reactions, *at least one of which is in the severe category*
Hypotensive reaction		Isolated fall in systolic blood pressure of 30mm/Hg or more occurring during or within one hour of completing transfusion *and* a systolic blood pressure of 80mm/Hg or less *in the absence of allergic or*	Hypotension, as previously defined, leading to shock (e.g. Acidaemia, impairment of vital organ function) *without allergic or inflammatory symptoms*. Urgent medical intervention required.

		anaphylactic symptoms. No/minor intervention required.	

Febrile and allergic reactions may present within 4 hours, whilst hypotensive reactions are considered as presenting within one hour.

Severity Grades for haemolytic transfusion reactions			
1=DAT without haemolysis	2=mild	3=moderate	4=severe
Not SHOT reportable	2 of the following • Falling Hb • Positive DAT • spherocytes	• Falling Hb • Rise in bilirubin • +/- Positive DAT • +/- spherocytes	• Falling Hb • Rise in bilirubin • Renal impairment • +/- Positive DAT • +/- spherocytes

If a severe reaction is suspected:

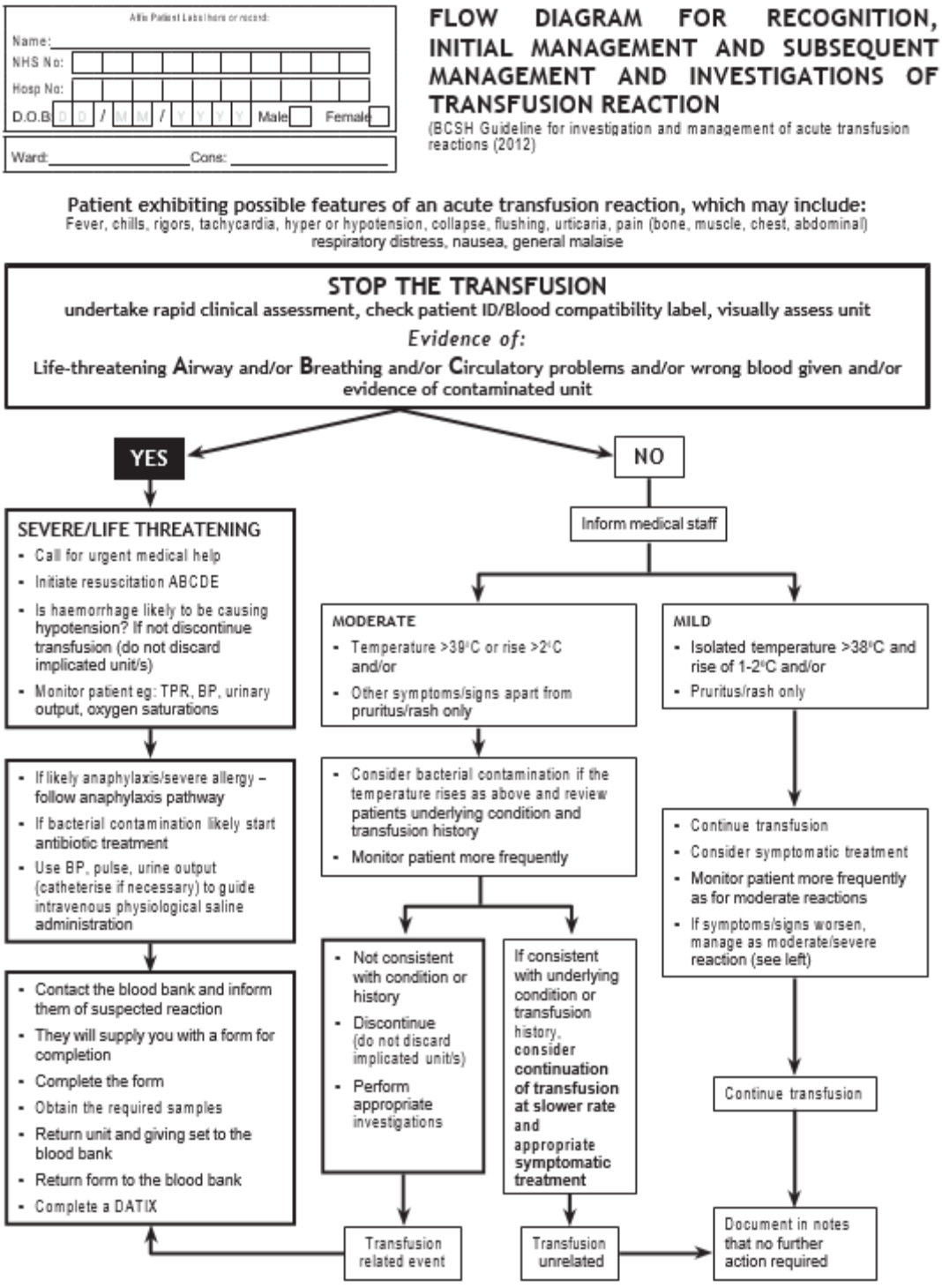
- **STOP the transfusion**.
- Seek urgent medical assistance
- Take down the blood with the giving set and replace with saline to be run slowly to maintain venous access
- Use an ABCDE approach to direct the treatment plan, including medications to treat anaphylaxis
- Check that the unit details match the patient (i.e. name, component group etc.)
- Take all observations and calculate NEWS score immediately, and continue at frequent intervals
- Maintain an accurate fluid balance, including the volume and colour of all urine passed
- Test urine for haematuria
- Contact blood bank to inform them of the situation and to obtain a reaction report form
- Return the unit of blood that was being transfused to the hospital blood bank via the Porters
- Collect any blood samples requested by the transfusion laboratory without delay
- Complete the reaction report form and return it to the blood bank
- Blood Bank to notify Transfusion Practitioners to investigate the reaction
- The clinician responsible for the patient should discuss all serious transfusion reactions with the on duty/on call consultant haematologist

Be aware if a patient undergoing massive haemorrhage develops hypotension, careful clinical risk assessment is required to ascertain if the blood component or the haemorrhage is the cause.

If the patient develops sustained febrile symptoms from the moderate category, bacterial contamination or haemolytic reaction should be considered

In the clinical area refer to the “Flow diagram for recognition, initial management and subsequent management and investigation of transfusion reactions” (BCSH Guidelines 2012) on the WR1251 Documentation for Transfusion of Blood Components pathway for further information. See below.

11. Transfusion reaction management algorithm



12. Investigations required following transfusion reaction

Symptoms	Investigations
Fever (>2°C rise or 39 °C), and/or chills, rigors, myalgia, nausea or vomiting and/or loin pain	Standard investigations* Take samples for repeat compatibility testing, DAT, LDH and haptoglobin Take blood cultures from patient Coagulation screen Do not discard implicated unit **If febrile reaction sustained,** return unit to laboratory, repeat serological investigations (compatibility testing, antibody screen and DAT), haptoglobin and culture unit **If loin pain,** perform serological investigations as above
Mucosal swelling (angioedema)	Standard investigations* measure IgA level (EDTA sample)- if <0.07g/L , and no generalised hypogammaglobinaemia, perform confirmatory test with sensitive method and check for IgA antibodies
Dyspnoea, wheeze, or features of anaphylaxis	Standard investigations* Check oxygen saturation or blood gases. Chest X-ray (mandatory if symptoms severe) If severe or moderate allergy suspected measure IgA level. If severe allergy/anaphylaxis suspected, consider measurement of serial mast cell tryptase (plain tube) (immediate, 3 h and 24 h)
Hypotension (isolated fall systolic of 30 mm resulting in level 80mm)	Investigate as for fever If allergy suspected measure IgA level. If severe allergy/anaphylaxis consider measurement of serial mast cell tryptase, as above

* Standard investigations: full blood count, renal and liver function tests, and assessment of urine for haemoglobin
Abbreviations: DAT, direct antiglobulin test; Ig, immunoglobulin; LDH, lactate dehydrogenase

13. Reporting

All transfusion reaction regardless of severity must be reported in the patient's notes.

- Patients with repeated febrile non haemolytic reactions may benefit from pre medication of oral paracetamol one hour prior to transfusion.
- Patients with repeated moderate to severe allergic reactions who are not IgA deficient need to be transfused in a clinical area with resuscitation facilities. *The use of prophylactic antihistamine may be considered although evidence of its efficacy is low*. Transfusion of washed red cells or platelets and the use of solvent detergent treated Plasma should be considered.

Moderate and severe reactions MUST be reported using an online incident form. The Transfusion Practitioner Team or Laboratory Manager will then report these to the Medicines and Healthcare Regulatory Authority.
All cases of suspected bacterial contamination MUST be reported to NHS Blood and Transplant so they can remove any other donor units from circulation.

Monitoring

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the Policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)*	Frequency of reporting:
	WHAT?	**HOW?**	**WHEN?**	**WHO?**	**WHERE?**	**WHEN?**
	• The administration of blood • Monitoring the patient throughout the process • Completion and documentation of the event • Management of transfusion reactions	Audit will be completed to establish if the key parts of the process are being followed	yearly	Transfusion practitioners/Blood bank	Trust Transfusion committee	4 times a year

References

Blood Safety & Quality Regulations 2005
https://www.legislation.gov.uk/uksi/2005/50/contents/made accessed 2/7/21
Robinson,S, Et al, The administration of blood components: a British Society for Hematology Guideline 2017 https://onlinelibrary.wiley.com/doi/full/10.1111/tme.12481 accessed 16.07.21

Contribution List

Contribution List

This key document has been circulated to the following individuals for consultation;

Designation
Consultant Haematologist
Consultant Urgent care
Consultant Specialised medicine
Consultants Women's and Children's
Consultant SCSD
Consultant Surgery
Blood Bank Manager
Community IV team lead
Private Hospital lead
Deputy Chief Nurse
Transfusion practitioner

This key document has been circulated to the chair(s) of the following committee's / groups for comments;

Committee
Trust Transfusion Committee
Clinical Governance Group

Supporting Document 1 - Equality Impact Assessment Tool

. To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Please complete assessment form on next page;

NHS Worcestershire Acute Hospitals NHS Trust

Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form
Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Herefordshire & Worcestershire STP		Herefordshire Council		Herefordshire CCG	
Worcestershire Acute Hospitals NHS Trust	✓	Worcestershire County Council		Worcestershire CCGs	
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust		Other (please state)	

Name of Lead for Activity	**Dr Thomas Skibbe**

Details of individuals completing this assessment	**Name**	**Job title**	**e-mail contact**
	Gill Godding	**Lead transfusion practitioner**	**gilliangodding@nhs.net**
Date assessment completed	**16/07/21**		

Section 2

Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.)	**Title: Administration of Blood Components and Management of Transfusion Requests**			
What is the aim, purpose and/or intended outcomes of this Activity?	Safe transfusion practice			
Who will be affected by the development & implementation of this activity?	❑ ✓ ❑ ❑	Service User Patient Carers Visitors	✓ ❑ ❑ ❑	Staff Communities Other _____
Is this:	❑ Review of an existing activity ❑ New activity ❑ Planning to withdraw or reduce a service, activity or presence?			

What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc.	NHS BT British Society for haematology guidelines Blood safety and Quality regulations NPSA safer practice notice No:14 MHRA Serious hazards of transfusion Serious adverse blood reactions and events
Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required)	
Summary of relevant findings	

Section 3

Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Age		✓		This policy will have neutral impact on all equality groups.
Disability		✓		
Gender Reassignment		✓		
Marriage & Civil Partnerships		✓		
Pregnancy & Maternity		✓		
Race including Traveling Communities		✓		
Religion & Belief		✓		
Sex		✓		
Sexual Orientation		✓		

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Other Vulnerable and Disadvantaged Groups (e.g. carers; care leavers; homeless; Social/Economic deprivation, travelling communities etc.)		✓		
Health Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)		✓		

Section 4

What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
	none	.		
How will you monitor these actions?				
When will you review this EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation)				

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation

1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the

diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	Gill Godding
Date signed	13/07/21
Comments:	
Signature of person the Leader Person for this activity	Thomas Skibbe
Date signed	13/07/21
Comments:	none

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	no
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments:	none

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.