Blood Transfusion Study Guide

Welcome. You have successfully accessed the Blood Transfusion Medical update module.

The medical module is designed to support safe and appropriate use of blood components/products for all prescribers.

Prerequisite: Staff involved in any aspect of transfusion must have completed a one-off blood transfusion competency. If you have not completed this STOP now and discuss with the Transfusion Practitioner for your site.

A transfusion can be lifesaving but there are risks. Always consider:

- Is the transfusion essential?
- Is there an alternative (cell salvage, oral or IV iron, pro-thrombin complex, iron rich diet)?
- Does the full blood count match the clinical picture/pathway?
- Base your decision on a thorough clinical assessment of the patient.

Further information can be found on the intranet.

Policies:
Blood transfusion policy for adults with related guidelines
Blood transfusion policy paediatrics and neonates with related guidelines

Clinical Guidelines Blood Transfusion:
Massive Haemorrhage
Prophylactic anti-D
Rapid Transfusion Protocol
Refusal of Blood Components
Safe Transfusion in HSCT Recipients
Transfusion Pre-Operative Management

Clinical Guidelines Haematology and VTE:
Emergency Reversal of Oral Anticoagulants

NICE Transfusion Guidelines (NG24)

The full NICE guidance can be accessed here https://www.nice.org.uk/guidance/ng24/

Red blood cells:

- For most patients consider a threshold of 70 g/L with a haemoglobin target of 70 – 90 g/L after transfusion.
- For patients with Acute Coronary Syndrome consider a threshold of 80g/L and a haemoglobin target of 80 – 100g/L after transfusion.
- Patients with chronic anaemia should have individual thresholds and targets set.
- Consider single-unit red blood cell transfusions for adults (or equivalent volumes calculated based on body weight for children or adults with low body weight) who do not have active bleeding.
- Review patient after each unit transfused to determine if more than one is required.

Platelets:
Patients who are not bleeding or having invasive procedures or surgery

- Offer prophylactic platelet transfusions to patients with a platelet count below 10×10^9 per litre who are not bleeding or having invasive procedures or surgery, and who do not have any of the following conditions:
  - chronic bone marrow failure
  - autoimmune thrombocytopenia
  - heparin-induced thrombocytopenia
  - Thrombotic thrombocytopenic purpura.
- Do not routinely transfuse more than a single dose of platelets.

Fresh Frozen Plasma:

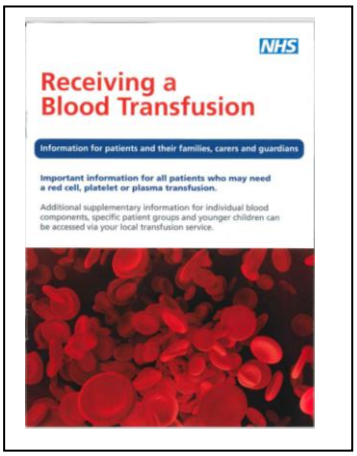
- Do not offer fresh frozen plasma transfusions to correct abnormal coagulation in patients who:
  - are not bleeding (unless they are having invasive procedures or surgery with a risk of clinically significant bleeding)
  - need reversal of a vitamin K antagonist.
- Standard adult dose is 15mL/Kg or 4 units of FFP for an average sized patient.
- Consideration must be taken if more than 5 units are required due to the large volume and risk of transfusion associated circulatory overload (TACO)

Prothrombin Complex Concentrate:

- Offer immediate prothrombin complex concentrate transfusions for the emergency reversal of warfarin anticoagulation in patients with either:
  - severe bleeding
  - head injury with suspected intracerebral haemorrhage.

Patient information:

- Provide verbal and written information to patients who may have or who have had a transfusion, and their family members or carers (as appropriate), explaining:
  - the reason for the transfusion
  - the risks and benefits
  - the transfusion process.
  - any transfusion needs specific to them.
  - any alternatives that are available, and how they might reduce their need for a transfusion.
  - that they are no longer eligible to donate blood
  - that they are encouraged to ask questions
- PDF copies of Receiving a Blood Transfusion are available on the intranet (Clinical Departments, Blood Transfusion, Information for patients) in English and multiple other languages.



Our Guidelines:

Appropriate Use:

Treat the patient not the blood count and explore alternatives such as oral or IV iron (see AEC Management Pathway for Anaemia without Acute Bleeding http://intranet/docstore/Departments/Ambulatory%20Care%20Pathways/ANAEMIA%20WITHOUT%20ACUTE%20BLEEDING%20V2.pdf)

Only emergency transfusions should be given at night.

Haemorrhaging/acutely unwell / severely symptomatic patients MUST be transfused without delay.

Patient Information and Consent:

- Gain consent as per NICE guidance/Trust policy

- Documentation occurs during the prepare and transfuse orders on Epic.
- Patient information leaflets (see below) are available on the wards or via the transfusion practitioners.

Prescription – 'Transfuse' order on Epic:
EPIC is used to order and prescribe blood components and products.

Blood Components:

- The "Prepare" order sends the order to the transfusion laboratory so that transfusion can issue the required blood components. The "Transfuse" order prescribes the component to the patient so clinical staff can document the transfusion process, including the essential bedside checks and observations and the start and stop times of the transfusion. The rationale for transfusion (NICE recommendations) is recorded during the ordering and prescribing process. You must complete both prepare and transfuse orders on Epic.

Blood Products:

- The process for ordering and prescribing remains the same as for blood components but the order will appear on the drug chart in Epic.

All urgent requests must be communicated with the Blood Transfusion Laboratory and Clinical Teams once prepare and transfuse orders have been completed.

A unit must be completed within 4 hours of the time it has been removed from the blood fridge. Ensure you do not prescribe for more than 3 hours on Epic.

Special Requirements:

- Make sure any special requirements such as Irradiated, CMV Negative or "warmed" are indicated on the prepare and transfuse orders on Epic.
- More information available on Epic (F1 help button) or on the intranet (Clinical Departments, Blood Transfusion, Epic Help

Sample Collection:

The most important step when taking a transfusion sample is to ensure you are taking the sample from the correct patient.

The **Right Patient** information items are:

- Full Legal Name
- Date of Birth
- Hospital or NHS number

These must be checked with the patient (using open questions), on the wristband and on Epic. Resolve any discrepancies before bleeding the patient. If the patient is unable to verbally identify themselves, the wristband is the ID used. It is good practice to ask the patient to confirm the first line of their address if they are an outpatient as they will not be wearing a wristband. The patient must also consent to the venepuncture.

Key Steps:

1. You must complete a full patient ID check using the patient's legal name.
2. Print the Epic label.
3. Take the sample using aseptic technique.
4. Handwrite the sample label at the patient's bedspace with full legal name, DOB, NHS/MRN number, date and time taken and your signature.
5. The correct Epic label must be placed in the bag with the sample.
6. Send sample to transfusion. Document that you have taken the sample on Epic.

REMEMBER: YOU MUST IDENTIFY THE PATIENT AND LABEL THE SAMPLE WITHIN THE PATIENTS BED SPACE WITH NO INTERUPTIONS. THE SAMPLE LABEL MUST BE LEGIBLY HANDWRITTEN AND THE CORRECT EPIC LABEL MUST BE SENT WITH THE SAMPLE OR THE SAMPLE WILL BE REJECTED BY TRANSFUSION.

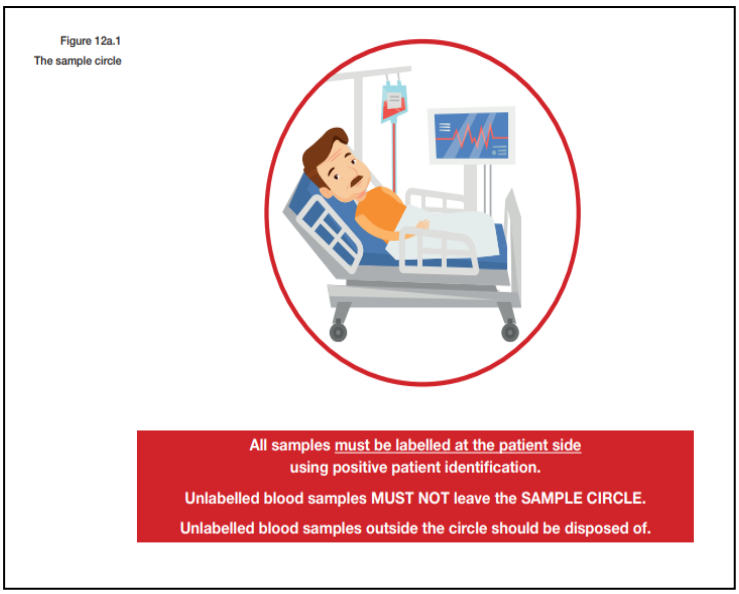


Figure 12a.1 from Serious Hazards of Transfusion Annual Report 2021

Unidentified/Unknown patients

If you have an unknown patient, then you must follow the FH policy:

1. Assign a random name using the phonetic alphabet (ie Zulu Bravo)
2. Use DOB 01/01/estimated year of birth.
3. Assign a new hospital number.

These patient details will be used for all treatment (including transfusion) until you are able to fully identify the patient. Once identified, these details will be merged with the correct patient details and new transfusion samples must be sent.

The Two Group Rule:

The British Committee for Standards in Haematology introduced the above rule in 2013 to try to prevent incompatible blood transfusions due to sampling errors. Unfortunately, this produced confusion around what this means for clinical practice.

To clarify

- blood can only be issued if there are two matching group results on the laboratory IT system.
- One result can be 'historical', i.e. from previous admissions
- DO NOT automatically send 2 samples for your patients.
- If a second sample is required, it must be taken at a different time to the original sample.
- 2 samples sent with the wrong details has the potential to result in an incompatible transfusion.
- If a patient is likely to need blood, send a group and screen sample and Epic will indicate if a second sample is needed.
- The most current result or sample will be the one used to issue blood and so must be valid within the time frames below.

Patient transfused / pregnant	Sample to be taken not more than
Less than 3 months	72 hours before transfusion
Never or more than 3 months	7 days before transfusion

Managing Transfusion Reactions:

- Any change in the patient's signs or symptoms during the transfusion should alert you to consider the patient may be having a reaction.
- The transfusion should be paused, recorded on Epic and check that the unit details are correct.
- Follow the guidance in the Transfusion policy and on Epic.

- If the decision is taken to discontinue, order a “Transfusion Reaction Investigation” on Epic. The remainder of the component and a new blood transfusion sample should be sent to the blood transfusion laboratory and an RL submitted.
- Remember patients can have a delayed reaction, so on discharge, patients should be given contact details to use should they experience any signs or symptoms of a reaction.

Management of a Massive Haemorrhage:

Activation is via 2222 (now also used at HWH)

Please remember to tell switchboard:

1. which activation you require: Adult, Paediatric or Obstetric
2. location remembering to state which site.
3. contact details (The transfusion lab will need these to contact the clinical team. Remember that transfusion cannot help you until you have told them the patient details so ensure someone is waiting for their phone call)

No documentation is required on Epic during a massive haemorrhage call. Retrospective documentation on Epic is required:

1. the medical team should order a “Massive Haemorrhage Protocol and Emergency Blood Use” and add the number of units transfused. This order **does not** activate the Massive Haemorrhage Protocol or request blood from transfusion.
2. Either the medical or nursing staff should document all the blood components transfused to the patient.

The “Massive Haemorrhage Protocol and Emergency Blood Use” on Epic must also be used when **emergency blood** is transfused to a patient even in a non-Massive Haemorrhage situation.

Emergency Blood (Flying squad):

Both O Rh D Negative and O Rh D Positive red cells are available in the blood issue fridges.

This should only be used in an emergency where issued blood is not yet available.

Ensure the appropriate type is collected and administered.

Ensure transfusion are made aware when EB removed so it can be replaced ASAP.

Please ensure the EB tag is completed with patents details and returned to transfusion.

Anti-D and Maternal Antibodies

Since the 1960`s anti D immunoglobulin has been administered to pregnant women with Rh D positive babies to prevent Rh D sensitisation. The introduction of anti D immunoglobulin prophylaxis injections dramatically reduced the number of deaths attributed to HDFN around the world.

Serious Hazards of Transfusion (SHOT) data shows that over the last ten years there has been a steady increase in reported incidents involving anti-D immunoglobulin administration. SHOT have stated that this could be a result of increased awareness of the need to report adverse events associated with the administration of this blood product. Published evidence suggests that poor compliance with guidelines for anti-D immunoglobulin administration is a

contributing factor to maternal sensitisation in the UK. In particular there is consistent failure to recognise potentially sensitising events in pregnancy, and failure to manage them appropriately when they do occur.

Indications for Anti-D (to be given within 72hrs of the event)

Anti-D Required:

Regardless of gestation

Ectopic Pregnancy	Molar Pregnancy	Termination (Surgical management only)
Chorionic villus sampling	Cordocentesis	Surgical management of pregnancy/ERPC
Amniocentesis	External cephalic version	IUD (at both diagnosis and delivery)
Fall/Abdominal trauma	In-utero intervention	

PV Bleeding <12/40 Gestation
Heavy bleeding and pain

PV Bleeding after 12/40 Gestation
Any PV bleeding or miscarriage

Continuous PV bleeding:
Where it is clinically judged to be the same sensitising event with no features suggestive of a new presentation or a significant change in the pattern or severity of bleeding, such as the presence of abdominal pain.
<12/40 Gestation
Required if bleeding is heavy or repeated or where this is associated abdominal pain, particularly if these events occur as gestation approaches 12/40
12 – 20/40 Gestation
Anti-D required at 6 weekly intervals for the duration of the bleeding.
>20/40 Gestation
Anti-D required at 6 weekly intervals for the duration of the bleeding.
Kleihauer required at 2 weekly intervals for the duration of the bleeding.

Anti-D Not Required:

PV Bleeding <12/40 Gestation
Spontaneous complete miscarriage without surgical management
Minor painless bleeding with viable pregnancy

Foetal Rh D testing (see Figure 1):

It is now possible to detect the Rh D status of the baby by taking a maternal blood sample from 11+2/40 as long as there is a confirmed EDD by scan. The test results will take approximately 14 days. The test is >99.9% accurate at predicting RhD negative status, so there is 0.1% risk of false negative. To mitigate against this risk, cord grouping at delivery will continue for baby`s predicted to be Rh D negative. As delivery is the primary sensitising event this reduces the risk of sensitisation significantly. If the cord result is Rh D positive the women will be offered anti-D.

Benefits for women with Rh D positive foetus:

The women will know that she requires anti-D for routine prophylaxis at 28-30/40, for any sensitising events & she will have anti-D as soon as possible after delivery eliminating the wait for cord testing.

Benefits for women with Rh D negative foetus:

The women will not receive unnecessary anti-D.

Inconclusive results:

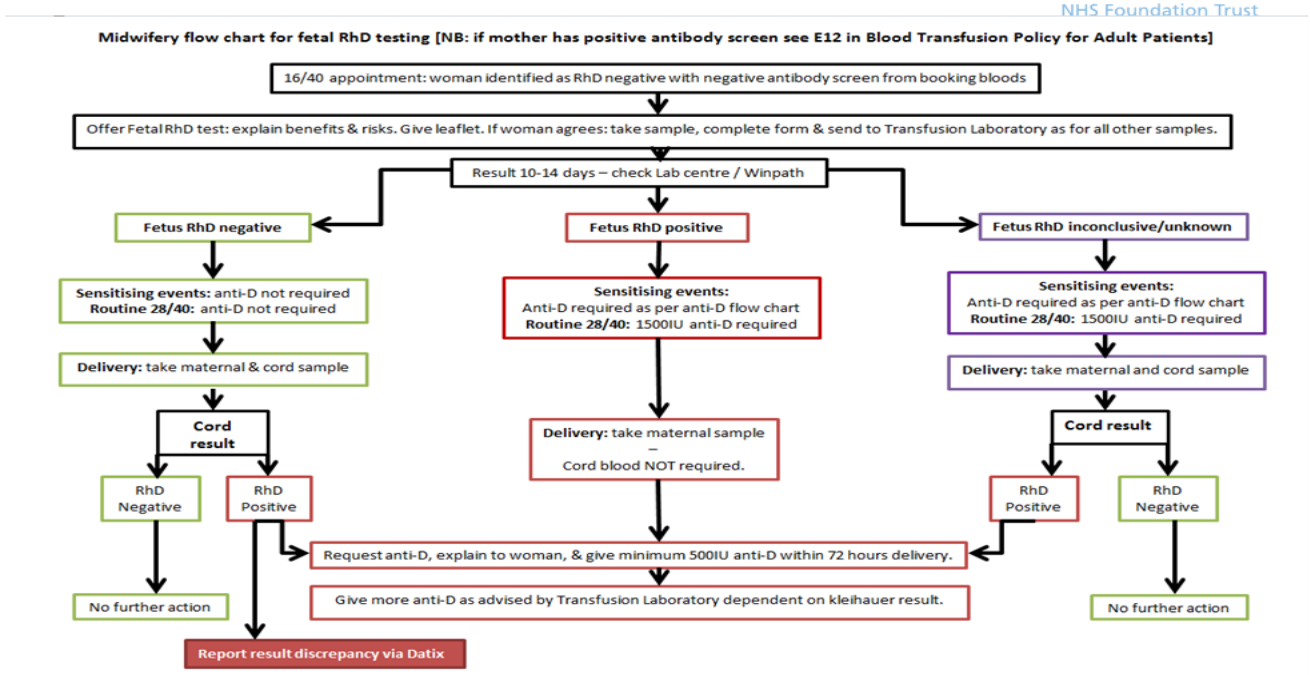
- There will be a small number whose result is inconclusive.
- These women will be treated as if the foetus is Rh D positive during pregnancy and receive anti-D for any event and their RAADP at 28/40.
- At birth they will need a cord sample taken to determine the Rh D status and will need further anti D if the baby is Rh D positive

Women should be given access to accurate information that allows them to understand the risks, benefits, and alternatives to, accepting or declining anti-D immunoglobulin and the Foetal Rh D testing. This information should be tailored to each woman's particular circumstances and communicated in a timely and readily understandable manner. These discussions should be documented in the patients' notes.

If a woman declines Foetal Rh D testing or RAADP, this should also be recorded in her notes.

Figure 1:

Frimley Health NHS
NHS Foundation Trust



Taken from Blood Transfusion Policy for Adult Patients V1.0 20/06/2019

Kleihauer Test:
The Kleihauer test or acid elution test is a blood test used to measure the amount of foetal haemoglobin transferred from a foetus to a mother's bloodstream. It is performed on Rh D negative mothers to determine the required dose of anti-D immunoglobulin to inhibit formation of Rh D antibodies in the mother and prevent Rh disease in future Rh D positive children. The test needs to be requested for any sensitising event of predicted Rh D Positive, predicted inconclusive or untested patients after 20/40 and post-delivery of an Rh D Positive baby. The Kleihauer test will determine if enough anti-D has been given. A negative Kleihauer means that no further anti-D is required. If the test is positive this means there has been a foetal maternal haemorrhage (FMH) of > 4mL, further anti-D may be required and a repeat Kleihauer will be required within 48hrs.

Maternal Antibodies:
Red cell antibodies have implications for the woman and for the foetus/newborn.
Laboratory results will indicate if and when further testing is required.
It may take longer to provide blood for those patients with antibodies.
The laboratory will notify the screening midwives of any women with clinically significant antibodies.
Antenatal should ensure the women is under the care of a consultant obstetrician and/or specialist unit.

You must now complete your assessment – please click on any picture during the assessment to enlarge the view.
If you PASS:
Please ensure you complete all modules relevant to your current role. MAST will change to green once you have completed all relevant modules. You will need to complete an update/knowledge assessment in 2 years' time.
If you have any further questions or wish feedback on your incorrect answers, please contact the transfusion practitioner team:
FPH ext 136532 or email fhft.fphtransfusionpractitioneradministrator@nhs.net
WPH ext 136532 or email fhft.hwphtransfusionpractitioneradministrator@nhs.net

You have 3 chances to pass the assessment but if you FAIL on the 3rd time:
Please contact the transfusion practitioner team
FPH ext 136532 or email fhft.fphtransfusionpractitioneradministrator@nhs.net
WPH ext 136532 or email fhft.hwphtransfusionpractitioneradministrator@nhs.net
In the meantime, you **should not** be involved in any aspect of transfusion.