

## Red Cell Transfusion

**Information for doctors, nurses  
and healthcare professionals**



**GIVE BLOOD**

# RED CELL TRANSFUSION INFORMATION FOR DOCTORS AND NURSES



Blood transfusion can save and prolong life, and improve its quality. But before ordering each transfusion you should consider whether it is really necessary.

The most frequent risk in blood transfusion is an error in administration of blood and associated errors. More than 60% of reports to the Serious Hazards of Transfusion (SHOT) office are of this nature.

Any serious adverse event must now be reported to SABRE through your blood bank and transfusion practitioner (EU Blood Directive 2002/98/EC). All hospital staff who contribute to the transfusion chain should receive training in the procedures they are required to carry out (NHS QIS Clinical Standards for Blood Transfusion 2006).

Blood is very safe in respect of known risks, although we can be less sure of vCJD. Blood transfusion can never be zero risk so think carefully before proceeding to transfuse. All red cells and platelets in NHSScotland come from unpaid volunteer donors.

The current known risks of red cell transfusion are (per unit of red cells issued):

Risk factor	Level of risk
Hepatitis B (HBV)	~1:850 000
Hepatitis C (HCV)	<1:50 000 000
HIV/AIDS	<1:4 850 000
HTLV I/II	1:10 000 000
vCJD	Unknown. Four cases reported to date
Bacterial contamination	1:2-10 000 (1-2 deaths in UK in 1 year).

## RED CELL CONCENTRATES

One unit is taken from a single donation of 470mL blood (+/- 50mL), and consists of 270mL (+/- 50mL) of red cell concentrate suspended in plasma plus additive solution. The concentrate is leucocyte depleted to  $<5 \times 10^6$  WBC/unit and contains  $>40\text{g Hb/pack}$  at a haemocrit of 0.55-0.75. One unit should increase Hb by 9g/L in a 70Kg recipient (range 6-11 depending on body weight and donation Hb). The donation is tested for HIV, HBV, HCV, HTLVI/II and syphilis.

Red cell concentrates must be stored at 4°C until  $<30$  minutes before required, under controlled conditions in a specific blood refrigerator. If a unit is removed from the refrigerator  $>30$  minutes before commencing transfusion, it may still be used if the transfusion is completed within 4 hours of removal. Each unit is usually given over 2 – 3 hours, assuming an infusion flow rate of  $\sim 100\text{mL/hour}$ .

Cost to NHSScotland of 1 red cell unit is £111.

## INDICATIONS

- **Perioperative/ITU transfusion**  
Transfusion in this situation is rarely indicated above Hb80g/L and almost never at Hb $>100\text{g/L}$ .
- **Bone marrow failure**  
Maintain Hb $>80\text{g/L}$  or, if platelet support is needed and bleeding is a problem,  $>100\text{g/L}$ . Severe anaemia can prolong the bleeding time. Red cell transfusion should rarely be necessary to treat iron and other haematinic deficiencies.

Please refer to the full SIGN guideline on perioperative transfusion and to the Handbook of Transfusion Medicine for detailed information on indications for use.

## MINIMISE THE NEED FOR DONOR BLOOD PRODUCTS

Consider the following at pre-op assessment:

- Pre-operative care; anaemia correction with iron, stop aspirin/warfarin when possible, etc.
- EPO (recombinant human erythropoietin) can stimulate red cell production in some circumstances (see BNF for licensed indications).
- Autologous programmes such as cell salvage, intra- or post-operative may be considered.

See BBT Toolkit at [www.transfusionguidelines.co.uk](http://www.transfusionguidelines.co.uk)

Although transfusion carries risks, and some of these are specifically due to the use of allogeneic blood (i.e. blood from another person), autologous blood also has some risks, including 'wrong blood given' and bacterial contamination (see below).

## ORDERING A RED CELL TRANSFUSION

The transfusion process, from ordering the blood to its infusion, exposes the patient to the greatest risk of an adverse event; either by receiving a component not intended for them, or one that was prescribed inappropriately, or that did not meet the patients requirements.

- The pre-transfusion request form must be completed fully and include all patient identifiers including date of birth, gender and patient identification/CHI number. You must refer to local policies if your patient cannot be identified fully for any reason.
- The sample for blood grouping and compatibility testing must be completed fully with all patient identifiers at the patient's bedside. Pre-printed patient addressograph labels should not be used.
- Check if your patient needs a special red cell component, such as CMV negative or irradiated blood - include this on the request form.
- Use the current hospital surgical blood ordering schedule for the relevant procedure, or the local transfusion policy for non-surgical transfusion requests.



## WHAT TO TELL YOUR PATIENTS ABOUT RED CELL TRANSFUSION

### You should explain:

- The reason for the transfusion to the patient (or their legal guardian/carer).
- Treatment options.
- Valid alternatives to transfusion.
- The option to refuse.
- The risks of transfusion.

(see NHS QIS Clinical Standards for Blood Transfusion 2006).

SNBTS produces a leaflet for patients and relatives with a peel off label to record your discussion. It is recommended that this leaflet be used to give appropriate advice to patients.

## ADMINISTRATION OF RED CELL TRANSFUSIONS

- Identity checks; you must positively confirm the patient's name and date of birth, and check the wristband against the compatibility label attached to the blood bag.
- Keep clear records in the patient's notes of the reason for transfusion, what was given, any adverse events and whether the transfusion had the desired effect. Whenever possible, use the peel off patient label from the Patient Information Leaflet to record your discussion with the patient.
- Observe the time limits for transfusion on page three.
- Use only those giving sets, infusion pumps, blood warmers and other equipment suitable for red cell transfusion.
- It is a legal requirement (BSQR 2005) to complete the traceability label and return it to the hospital blood bank.

## MONITORING PATIENTS FOR ADVERSE REACTIONS OF TRANSFUSION

- Before starting each unit, record blood pressure (BP), pulse and temperature.
- Check pulse and temperature 15 minutes after starting each blood unit.
- Observe the patient throughout the transfusion. You should follow the advice in your local transfusion guidelines. Overnight transfusions should not take place except in emergency situations.
- Repeat BP, pulse and temperature when transfusion is completed.
- An unconscious patient should have pulse and temperature checked at regular intervals during the transfusion.

## MANAGING SERIOUS ADVERSE REACTIONS OF RED CELL TRANSFUSIONS

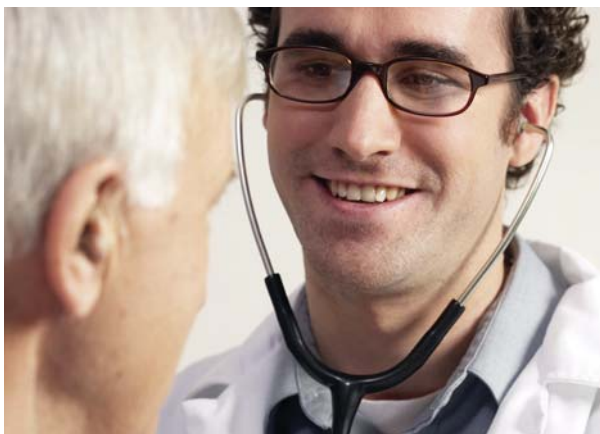
- **STOP THE TRANSFUSION** - change the administration set, keep the line open with saline: **KEEP ALL RESIDUAL BLOOD PACKS.**
- Recheck the identity of patient, blood unit and documentation.
- Check and record the patient's temperature, BP, pulse, respiratory rate and check for dyspnoea, tachypnoea, wheeze, cyanosis.
- Notify blood bank.
- Check blood gases or O<sub>2</sub> saturation. Maintain airway.
- Seek expert advice if the patient's condition continues to deteriorate.

## OTHER ADVERSE EVENTS OF TRANSFUSION

- Fluid overload.
- Acute haemolytic transfusion reaction.
- Infusion of a bacterially contaminated unit.
- Transfusion Related Accute Lung Injury (TRALI).
- Severe allergic reaction or anaphylaxis.
- Serious adverse reactions must be reported to SABRE.

## EDUCATIONAL RESOURCES & SUPPORT

- NHSScotland and hospital policy require you to update your knowledge of the transfusion process, indications and risks on a regular basis. Training is available through your local Transfusion Practitioner, local SNBTS Clinical Directorate and online. It is **your** responsibility to keep up to date as your GMC/NMC revalidation may depend on it.
- UK Blood Transfusion and Tissue Transplantation Guidelines: Handbook of Transfusion Medicine  
<http://www.transfusionsguidelines.org.uk/>
- SIGN Guideline on Perioperative Transfusion  
<http://www.sign.ac.uk/guidelines/>
- British Committee for Standards in Haematology (BCSH) guidelines  
<http://www.bcshguidelines.com>
- Serious Hazards of Transfusion Reporting Scheme  
<http://www.shotuk.org>
- SNBTS Better Blood Transfusion e-learning site  
<http://www.learnbloodtransfusion.org.uk>
- Serious Adverse Blood Reactions and Events (SABRE) <http://www.mhra.gov.uk>
- NHS QIS Clinical Standards: Blood Transfusion  
<http://www.nhshealthquality.org>



## IS BLOOD TRANSFUSION NECESSARY?

There is no universal “trigger” for transfusion.

Transfusion given at any haemoglobin level can cause morbidity and mortality. Unnecessary transfusion increases this risk.

If the haemoglobin is below 70g/L, transfusion is usually indicated.

If the haemoglobin is above 70g/L and under 100g/L, the decision to transfuse should be based on the clinical condition of the patient.

If the haemoglobin is above 100g/L, transfusion is rarely indicated.

## RIGHT BLOOD, RIGHT PATIENT, RIGHT TIME

### **ALWAYS positively confirm the patient's identity**

Ask the patient (if able) to state their surname, first name and date of birth - check against the ID band

### **CHECK the patient's details are identical on the ID band and the pack**

Do the check at the patient's bedside  
If there is any discrepancy DO NOT transfuse

### **TRANSFUSE blood within 4 hours of taking it out of the fridge**

Avoid overnight transfusion in a stable patient

## Contact Details:

SHOT Office for incident reporting 0161 321 1234  
SNBTS 0131 536 5700 SABRE 020 7084 3336

This publication can also be made available in large print, Braille (English only), audio tape and in different languages. If you would like further information contact The Public Affairs Department Tel. 0141 357 7752