

Guidelines for manual exchange blood transfusion (EBT) in the emergency setting in adult sickle cell disease

DISCLAIMER: This guideline is for information purposes only and is not intended to inform any individual clinical decisions. STSTN and its members do not accept any responsibility for outcome of clinical decisions made as a result of reading these guidelines. All guidelines have been peer-reviewed and agreed to be published by the relevant lead consultants in the network.

Exchange transfusion should always be discussed with the sickle cell consultant or the haematology consultant on-call.

The procedure should be performed by a member of the haematology team (Consultant, SpR, SHO or CNS). Medical teams or ITU teams may also perform EBTs after discussion with the haematology team.

Indications:

- 1) Acute neurovascular event
- 2) Acute chest syndrome
- 3) Clinical deterioration in pregnancy *
- 4) General deterioration due to a severe vaso-occlusive crisis requiring escalation of treatment/ITU admission
- 5) Sustained priapism refractory to routine management

*Needs to be performed on HDU/labour HDU with fetal monitoring and close liaison with obstetric team.

Preparation:

Blood Tests – Full blood counts, reticulocytes, LDH, biochemistry.

Always request a haemoglobin S % pre and post exchange, to gauge efficacy of the exchange transfusion.

Blood: 6-8 cross-matched units (see how to calculate below) of HbS negative, blood preferably <7 days old. Please inform the blood bank that the blood is intended for a sickle patient. It should be matched for ABO, Rh (D,C,c,E,e) and K antigens

High flow venous access – either via standard femoral line or vascath (apheresis line), or large vein cannula if patient has two large bore veins accessible. (Minimum grey or orange venflon)

Sterile pack, gloves etc

20-60ml syringes

3-way tap

Venesection bags (from haematology day unit)

Large sharps bin

Admission to HDU should be considered but not essential, and EBT can be performed on a general medical ward, provided that there are sufficient staff for close supervision of an acutely unwell patient.

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Monitoring (COMPULSORY):

Observations including BP, HR, temperature & oxygen saturation.

- Prior to, and post removal of unit of blood;
- Before, and 15 minutes into the transfusion of a unit of blood.
- As clinically indicated

Methods:

NOTE: *The blood must be checked by two trained people, and the hospital Transfusion Policy must be followed.*

Ensure that the details on the compatibility label (tag) on the blood bag match those on patient's wristband and prescription chart.

- Set up a normal saline infusion 1l and run 500mls over 15 to 30 minutes to ensure pre- hydration before the procedure.
- Ensure that the blood to be transfused is set up before venesecting the patient, to avoid hypotensive emergencies and to ensure a degree of warming of the blood prior to transfusion.
- Note that procedure should be performed more slowly than described in patients with significant renal or cardiac abnormalities, or if acutely cardiovascularly unstable.
- Note that the patient should be kept in overall fluid balance throughout the procedure. This may require the infusion of additional saline if small units of blood are provided.
- To venesect: remove 450-500ml of blood over approximately 15-30 min
*Blood can be aspirated from the line using 20-60ml syringes, which can either be discarded in a **fresh** sharps bin – and easily counted if necessary – or using a 3-way tap expel the contents into an attached venesection bag.*
- A repeat Hb is required on completion of the procedure and should not exceed 10g/dl if Hb S% more than 30%. Haematocrit should not exceed 0.33.
- Calculate the amount to be exchanged, depending on starting haemoglobin, as follows:
 - Hb >8.0g/dl 5-8 units
 - Hb 6-7.99g/dl 4-6 units
 - Hb <6 g/dl up to 4 units

PROCEDURE

Hb >8.0g/dl

Venesect 1 st unit	WHILST	Replacing with 500 mls of normal saline stat
Venesect 2 nd unit	THEN	Transfuse 1 st unit over 30-40 minutes. *
Venesect 3 rd unit	THEN	Transfuse 2 nd unit over 1hour
Venesect 4 th unit	THEN	Transfuse 3 rd unit over 2 hours

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Check FBC and Hb S

If Hb < 9g/dl

Transfuse 4th and consider 5th units (over 3 hours each)

If Hb > 9g/dl

Restart from "venesect 1st unit"

NB This method involves removing 2 units of blood before transfusing the 1st replacement unit, and results in a more efficient lowering of HbS%. However if the patient is cardiovascularly unstable, or becomes hypotensive during the venesection, the replacement transfusion should be started sooner, ie after the venesection of the 1st unit.

Hb 6 – 7.99g/dl

Venesect 1st unit

Transfuse 1st unit.

Venesect 2nd unit

Transfuse 2nd, 3rd and 4th.

Further exchange may be required (see "Hb 8.0-10g/dl") if insufficient clinical improvement/impact on HbS%.

Hb < 6

Top up transfusion to Hb 8-10g/dl (over 90 minutes to 3hours per unit depending on clinical condition).

Formal exchange may be required (see "Hb 8.0-10g/dl") if insufficient clinical improvement/impact on HbS%.

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