**Emergency Manual Exchange Transfusion for patient with Sickle Cell Disease**

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| **Profile** | |
| **Version:** | *V3.0* |
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| **Executive/Divisional sponsor:** | *Dr Lisa Pickering, Divisional Chair (v3.0 Feb 2019)* |
| **Applies to:** | *All staff involved in the care of patients with Sickle Cell Disease* |
| **Date issued:** | *February 2019 V3.0*  *February 2020 V3.1* |
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| **Approval** | |
| **Approval person/Committee:** | *MedCard Divisional Governance Board* |
| **Date:** | *14th February 2019* |
| **Approval person/Committee:** | *Hospital Transfusion Committee* |
| **Date:** | *March 2020* |

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**Policy Gateway**

Please complete the checklist and tables below to provide assurance around the policy review process.

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| ☒ I have involved everyone who should be consulted about this policy/guidance  ☒ I have identified the target audience for this policy/guidance  ☒ I have completed the correct template fully and properly  ☒ I have identified the correct approval route for this policy/guidance  ☒ I have saved a word version of this policy/guidance for future reviews and reference |

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| Please set out what makes you an appropriate person to conduct this review: |
| Consultant for Adult Haemoglobinopathy service |

|  |
| --- |
| Please set out the legislation, guidance and best practice you consulted for this review: |
| * West Midlands Review Service – Quality Standards: Health Services for People with Haemoglobin Disorders (2018/19) * Standards for the Clinical Care of Adults with Sickle Cell Disease in the UK 2018 (Sickle Cell Society) <https://www.sicklecellsociety.org/wp-content/uploads/2018/04/Web-version-FINAL-SCS-Standards-GSM-6.4.18.pdf> * British Society Haematology : guidelines Red Cell Transfusion in Sickle Cell Disease Part I and Part II (7.11.17 and 18.11.18) <https://b-s-h.org.uk/guidelines/guidelines/red-cell-transfusion-in-sickle-cell-disease-part-l/> * South Thames Sickle Cell and Thalassaemia Network guidelines 2012 (STSTN.org) |

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| Please identify the key people you involved in reviewing this policy why, and when: |
| * Kelly Feane – Lead Transfusion Practitioner |

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| Summarise the key changes you have made and why: |
| Updates in line with the UK standards of care for SCD  Updated contact details |

**Executive Summary**

Transfusion in patients with Sickle Cell Disease (SCD) and thalassaemia is increasing rapidly across the UK but with variability in indications and lack of robust evidence in many cases. Guidance is now issued by both the British Standards of Haematology (2016) and from the Standards of Clinical Care for adult patients with SCD in the UK. This guideline covers how to perform an emergency manual exchange for in patients with Sickle Cell Disease.

## Introduction

Transfusion in patients with Sickle Cell Disease (SCD) and thalassaemia is increasing rapidly across the UK but with variability in indications and lack of robust evidence in many cases. Guidance is now issued by both the British Standards of Haematology (2016) and from the Standards of Clinical Care for adult patients with SCD in the UK.

Both manual and automated exchange transfusions are suitable in the emergency setting for patients with acute sickle complications. A manual red cell exchange typically aims to exchange about one‐third of the patient's blood volume thereby achieving about 30% HbA. This guideline explains how to perform a manual exchange transfusion.

These guidelines should be used in conjunction with the St George’s University Hospitals NHS Blood Transfusion Policy <http://stg1wordpress01/wordpress/wp-content/uploads/2016/06/Blood-Transfusion-Adults.pdf>

## *Status and Purpose*

*This document is part of the Haematology Department’s guidelines on the management of patients with SCD and is applicable to all staff involved in the care of these patients.*

## *Definitions*

*Sickle Cell Disease – inherited lifelong condition due to abnormal haemoglobin variant.*

## *Scope*

*This guideline is relevant to the care of patients with SCD requiring elective and emergency surgery at St.George’s.*

## *Roles and Responsibilities*

### *5.1 Haemoglobinopathy team (Consultant haematologists, Clinical Nurse Specialist and Clinical Health Psychologist) – Responsible for the care of these patients, developing and updating guidelines to be reflective of good practice and to deliver the training to ensure good safe care.*

***5.2 Medical staff involved in the care of patients with SCD.*** *Responsible with the oversight of the haemoglobinopathy team to deliver the care to these patients in line with guidelines where possible.*

***5.3 Nursing staff and allied health professionals involved in the care of patients with SCD on wards, day unit and other areas of St George’s*** *responsible with the oversight of the haemoglobinopathy team to deliver the care of these patients in line with guidelines where possible.*

6.0 Manual Exchange Transfusion in patients with Sickle Cell Disease

At SGH emergency exchange transfusions are usually automated. The decision to perform an exchange transfusion should be made by the haematology registrar in liaison with the haematology consultant for haemoglobinopathies or the on call haematology team out of hours.

Any patient requiring emergency exchange transfusion will need to be on an HDU bed as a minimum so discussion with critical care is essential. This must happen before agreeing to transfer a patient from another site. Exchange transfusion should always be discussed with the sickle cell consultant or the haematology consultant on-call.

The post transfusion target Hct should be no higher than 33% and HbS% should be <30%.

If it is not possible to perform an automated exchange, then a manual exchange can be done and the guidelines for this follow.

A manual red cell exchange typically aims to exchange about one‐third of the patient's blood volume thereby achieving about 30% HbA. This should be done isovolaemically, typically removing a larger volume of blood than that transfused and making up the volume difference with 0·9% sodium chloride (normal saline). Although practices vary, a typical adult exchange would involve the removal of 4 red cell units with transfusion of 3 units; this will increase the Hb by 10–20 g/l and may require the removal of additional units at the end of the procedure

For indications and discussion of emergency exchange transfusion in patients with SCD see full guidelines on blood transfusion in patients with SCD

**6.1 The Procedure.**

**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.
* 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

**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 according to the hospital Transfusion Policy – this policy must be followed.*

* 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:

1. Hb >80 g/L 5-8 units
2. Hb 60-79 g/L 4-6 units
3. Hb <60 g/dl up to 4 units

**PROCEDURE if starting Hb >80g/L**

* Venesect 1st unit WHILST Replacing with 500 mls of normal saline stat
* Venesect 2nd unit THEN Transfuse 1st unit over 30-40 minut minutes. \*
* Venesect 3rd unit THEN Transfuse 2nd unit over 1hour
* Venesect 4th unit THEN transfuse 3rd unit over 2 hours
* Check Hb level
  + If Hb <90g/L THEN transfuse 4th unit and consider 5th unit (can check Hb between)
  + If Hb >90g/L THEN 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.**

**PROCEDURE if starting Hb 60 – 79g/L**

* Venesect 1st unit and transfuse 1st unit.
* Venesect 2nd unit and transfuse 2nd, 3rd and 4th unit (check Hb between 3rd and 4th unit)

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

**PROCEDURE if starting Hb <60g/L**

* Top up transfusion to Hb 80-100g/L
* Formal exchange may or may not be required (starting from “Hb 80-100g/L”) depending on clinical response and HbS%

## Dissemination and implementation

### 7.1 Dissemination:

Guidelines will be available on the departmental intranet page and available in paper form in the junior doctor office in haematology.

### 7.2. Implementation

Guidelines will be promoted by the haemoglobinopathy team.

## Consequences of Breaching the Policy

## Failing to follow this policy could lead to action under the Trust’s disciplinary policy.

## Monitoring compliance

The table below outlines the process for monitoring compliance with this document.

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| **Monitoring compliance and effectiveness table** | | | | | |
| **Element/ Activity being monitored** | **Lead/role** | **Methodology to be used for monitoring** | **Frequency of monitoring and Reporting arrangements** | **Acting on recommendations and Leads** | **Change in practice and lessons to be shared** |
| *WMQRS peer review quality standards* | *Consultant haematologist* | *As required (every 2-3 year)* | *The lead or committee is expected to read and*  *interrogate the report to*  *identify deficiencies in the system and act upon them. Consider stating this responsibility in committee terms of reference.* | *Required actions will be identified and completed in a specified timeframe.*  *Consider stating this responsibility in committee terms of reference.*  *These will be discussed at Divisional governance board* | *Required changes to practice will be identified and actioned within a specific timeframe. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders.* |

## Associated documentation

Incentive Spirometry guideline for adults admitted with sickle cell crisis at risk of acute chest syndrome

## References

* West Midlands Review Service – Quality Standards: Health Services for People with Haemoglobin Disorders (2018/19)
* Standards for the Clinical Care of Adults with Sickle Cell Disease in the UK 2018 (Sickle Cell Society) <https://www.sicklecellsociety.org/wp-content/uploads/2018/04/Web-version-FINAL-SCS-Standards-GSM-6.4.18.pdf>
* British Society Haematology : guidelines Red Cell Transfusion in Sickle Cell Disease Part I and Part II (7.11.17 and 18.11.18) <https://b-s-h.org.uk/guidelines/guidelines/red-cell-transfusion-in-sickle-cell-disease-part-l/>