

# Automated Red Cell Exchange

## Information for patients and parents

### Introduction

This leaflet has been provided to help answer some of the questions you or those you care for may have. It is not meant to replace the consultation between you and your medical team, but aims to help you understand more about what you discussed together.

### What is an automated red cell exchange?

A red cell exchange involves separating the red cells from the other blood components. These are removed using an apheresis machine, and then the other blood components are returned back to the patient, along with normal donor red cells.

### Why is a red cell exchange required?

The reason for red cell exchange varies depending on the patient, but currently at St Mary's Hospital, we only perform automated exchange on sickle cell patients. There are 5 main reasons we carry out red cell exchange:

- Pre surgery
- Pre Blood and Marrow Transplant (BMT)
- Acute sickle crisis
- Iron overload
- Prevention of sickle crisis in patients with other complications

### What happens before the procedure?

You will usually have to attend 1 or 2 days before the procedure for blood tests and your child's height and weight. These are essential to make the correct calculations for the procedure, and for ordering the correct volume of blood. You will also have a consultation with one of the specialist nursing staff, who will assess your child's veins for suitable peripheral access for the procedure. Please see the section on peripheral access for more information.

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## Consent

We involve the patient and carer in all decisions made with regards to patient care, and you have the freedom to discuss any questions you may have. This includes the reason for exchange, what the procedure involves, as well as any possible side effects. You will not have to sign a consent form, but your verbal consent to the procedure will be documented in the medical notes.

## Peripheral Access

One of the most difficult challenges of an automated exchange is adequate access to perform the procedure. Despite assessing the veins prior to the procedure, there are many variables that can change and prevent adequate peripheral access with cannulas. Please ensure you or your child drinks plenty of fluids the day before and the morning of the procedure to assist with gaining peripheral access.

In very rare circumstances, it may be decided that your child does not have adequate veins for peripheral access, and a central line may need to be sited. This is usually a femoral line, which is larger than a cannula and is placed into the femoral vein, found in the groin area. If central access is required it may not be possible to perform the exchange on that day and may require rescheduling

## What to remember on the day

- Wear loose clothing (no long sleeves)
- Bring any necessary regular medication that is needed
- Drink plenty of fluids
- If you as the parent have a phobia of needles/blood, please bring another family member over the age of 18 years with you to stay with the child throughout the procedure.
- The patient is required to remain fairly still during the procedure, so as not to affect the flow of blood in and out of the peripheral access. So feel free to bring any comforters/DVDs/entertainment you think may encourage them to relax and remain still for up to 4 hours during the procedure.
- We do provide food e.g. sandwich snack boxes on the day, your child can eat or drink as they please during the procedure, however, you will be required to assist in helping to feed your child whilst they maintain that their arms remain as motionless as possible. If you wish, you can bring a variety of your own snacks/drinks. We have a kitchen available with a microwave you can use to prepare any meals for yourselves or your child.
- If your child requires the toilet during the procedure, it is necessary for them to do so at the bedside. Unfortunately, due to the nature of the access and procedure, it cannot be paused or disconnected.

**PLEASE NOTE: For one hour post procedure, it is important to remember that your child can get up from the bed to go to the toilet, but they must be assisted by yourself (and additional help if required) and you must also accompany them inside the toilet in the event they may become faint/dizzy/unwell. This is not common, but sometimes occurs due to the large fluid shift caused after the exchange.**

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## Possible problems encountered during automated exchange

- Problems gaining peripheral access
- Citrate toxicity: tingling/numbness in toes, fingers, lips, tongue due to low levels of serum calcium
- Fainting
- Headaches
- Low blood pressure
- Transfusion related reaction: fever, chills, rash, shortness of breath, anaphylaxis

## What happens during the procedure?

Checks on your child's vital signs (Blood pressure, temperature, pulse, respiratory rate) will need to be carried out pre and post procedure, and at regular intervals throughout the procedure. This is to ascertain that your child is stable, and to assist with detecting any side effects that may be occurring.

The procedure will need to begin promptly after the 2<sup>nd</sup> cannula is sited, to ensure that it does not stop allowing the out flow of blood to the machine. Should this happen at any point during the procedure, every effort will be made by the nurse leading the procedure to unblock the cannula, should this fail a further cannula may be required to be sited (this is rare, due to the expertise of our staff in maintaining good access, but can happen. In rarer circumstances the procedure may need to be abandoned and re-scheduled on another day).

The length of procedure depends on:

- the size of the child
- the target of the procedure
- the compliance of the child throughout the procedure
- how good the access is
- how well the child tolerates the procedure.

On average the procedure takes approximately 4 hours, but if this is your first exchange it is important to arrange things so you and your child are available for the whole day.

If your child is small, or low in albumin pre-procedure, has low starting haemoglobin, or suffers other complications they may require an albumin prime on the machine to ensure their safety throughout the procedure. Albumin will then be mixed with blood and transfused, to replace the blood removed during the first part of the procedure. Human albumin is another blood product and therefore consent for its use will be the same as for the procedure itself.

You will be asked to remain fairly still throughout the procedure, due to the access, and any delay or pause to the procedure may result in the cannula blood flow stopping requiring for a new cannula to be sited. You can however sit up and eat and drink freely throughout the procedure.

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## What happens after the procedure?

Your vital signs will be checked again and post procedural bloods taken, to assess the efficacy of the procedure.

Once you are disconnected from the machine, you must remain sitting or lying down for at least 45 minutes. If you are required to get up during this period e.g. for the toilet, you will need to be assisted and within arm's reach of someone capable of supporting you at all times. In the following 15 minutes you wait to be discharged, you can attempt to get up and walk around again with close assistance.

You will only be discharged after a minimum of 1 hour post procedure. If it is your first exchange you need to be aware that this can be longer, as you will need to wait for all your results before we can discharge you. For regular exchanges you are required to wait for your haemoglobin results before you are allowed to go home.

**NB: Any persons who suffer an adverse event during or post procedure may not be discharged and may require admission for observation. This is to maintain the safety of the patient.**

## Will I need regular exchanges?

This will be decided by your Consultant haematologist, dependent on your requirements and reasons for exchange.

## Who can I contact for further information?

Please feel free to ask the nurse carrying out your procedure, or the registrar present on the day unit any questions you may have. You can also discuss any additional concerns with your consultant in clinic. Write down any questions you feel you may forget on the day of the exchange.

**Paediatric Haematology Department opening times:** Mon 09.00-17.00; Tue 09.00-15.00; Wed 07.30-17.00; Thu 09.00-16.00  
Fri 10.30-20.00. We are closed bank holidays and weekends.

### Useful contacts

Please contact the relevant lead nurse responsible for your exchange (if known).

**Lead Paediatric Haematology Clinical Nurse Specialist:** please call the Paediatric Haematology Day unit (PHD) on 0203 312 5080/5081/5096.

For **pre BMT exchanges** you can contact the BMT co-ordinators Mon-Fri 08.00-16.00 on 0203 312 5062.

**Paediatric Haematology Nurse Educator** Mon-Fri 09.00-17.00 call switchboard on 0203 312 6666 and ask them to bleep 2247, please stay on the phone and allow for bleep to be answered.

**Haemoglobinopathies CNS** Mon-Fri 09.00-17.00 on 07795651153.

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## How do I make a comment about my treatment?

We aim to provide the best possible service and staff are happy to answer any questions you may have. If you were pleased with your care and want to write to let us know we would appreciate your time in doing so.

However, if your experience of our services does not meet your expectations and you would like to speak to someone other than staff caring for you, please contact the patient advice and liaison service (PALS) on 020 3313 3322 for Charing Cross, Hammersmith, and Queen Charlotte's and Chelsea Hospitals or 020 3312 7777 for St Mary's and Western Eye Hospitals. You can also email PALS at [pals@imperial.nhs.uk](mailto:pals@imperial.nhs.uk). The PALS team will listen to your concerns, suggestions or queries and are often able to solve problems on behalf of patients.

Alternatively, you may wish to express your concerns in writing to:

The Chief Executive  
Imperial College Healthcare NHS Trust  
Trust Headquarters  
The Bays, South Wharf Road  
London W2 1NY

## Alternative formats

This leaflet can be provided on request in large print, as a sound recording, in Braille, or in alternative languages. Please contact the communications team on 020 3312 5592.