

Blood transfusion: Threshold for top up in Newborn Intensive Care Unit (NICU)

Procedure Responsibilities and Authorisation

Department Responsible for Procedure	Neonatal Intensive Care Unit
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Target Audience	Nurse Practitioners, Clinical Nurse Specialist, Registrar, Nurses, Senior Medical Officer
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Procedure Review History

Version	Updated by	Date Updated	Summary of Changes
1	Phil Weston	Nov 2011	
2	Phil Weston	Feb 2016	
3	Phil Weston	Dec 2016	Dosage
4	Phil Weston	Sep 2019	Change of threshold for transfusion
4.1	Phil Weston	Dec 2019	Simplification of threshold for top-up transfusion table

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1 Overview

1.1 Purpose

To provide guideline on threshold and dosage of transfusion to infants in Neonatal Intensive Care Unit (NICU)

1.2 Scope

Waikato District Health Board (DHB) medical staff working in NICU

1.3 Patient group

Babies and infants in NICU

1.4 Exceptions / contraindications

Parental, cultural or religious reasons

Note: If parents decline blood transfusion for their baby, they must sign *the Medical Directive for patients who refuse blood transfusions (including Jehovah Witnesses) G3825HWF*. This form is available on intranet: Everything Blood.

1.5 Definitions

Blood	Blood products that consist of red cells, platelets, fresh frozen plasma, cryoprecipitate and albumin.
Aliquots	Blood is given intermittently whereby the prescribed amount is divided into 3 or 4 portions and each portion is administered as a slow push over 5-10 minutes at hourly interval until the transfusion is completed.
Infusion	Blood is given by an infusion for volume replacement over half to one hour <u>or</u> for top up transfusion over 3-4 hours as prescribed.
NNP	Neonatal Nurse Practitioner
CNS	Clinical Nurse Specialist
FiO₂	Fraction of inspired oxygen (inspired oxygen percentage)

2 Clinical Management

2.1 Competency required

- Neonatal Nurse Practitioners, Clinical Nurse Specialist, Registrar, Nurses, Senior Medical Officer
- Registered nurse with Waikato DHB generic IV certification

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2.2 Procedure

2.2.1 Threshold for top up transfusion

Table 1: Threshold for top-up transfusion

Age (d)	Vent	CPAP or O2	Air, no support
<8	120	100	100
8-14	100	100	85
>14	100	85	85 if retics<100

2.2.2 Cross-matching

The requirements for compatibility testing are simpler than in the past, assuming that the maternal antibody screen is negative, the requirements are:

- **First Transfusion:** Mother's blood + baby's blood
- **Second Transfusion:** Baby's blood again required (to confirm initial blood group)
- **Third and Subsequent Transfusions**
 - Further blood samples are not required until 4 months of age. Complete the pink cross-match forms including the baby's blood group. Send this form via the Lamson Transport System to the Blood Bank, and phoned simultaneously to make the order verbally. Blood will be sent via the Lamson when it is available.
 - If maternal antibody screen is positive at the outset then re-cross-matching for each unit may be necessary. Blood Bank will advise.
 - If the antibody status of the mother is unknown, routine cross-matching may be required for each subsequent transfusion.

2.2.3 Dose

The usual volume administered is 10 ml/kg in aliquots over 4 hours.

2.2.4 Special considerations to reduce risks of potential complications

Graft versus host disease

The following categories of babies require the blood to be irradiated:

- Congenital cellular immunodeficiency state
- Possibility of Catch 22 syndrome (until genetics is declared normal).
- Previous intra-uterine transfusions (irradiation out to 6 months of age is indicated)
- Birth Weight < 900g
- Gestation < 28 weeks

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Indicate on the request form that irradiated blood is required.

For top-up transfusions, Blood Bank will irradiate up to seven day old blood, and it must be used within five days of irradiation.

Cytomegalovirus

Blood Bank will endeavour to provide CMV-safer blood components for babies with birth weight < 1500g. This is achieved with the use of pre-storage leucodepletion or the selection of CMV antibody negative blood products. Neither method alone or in combination can completely avoid transmission.

2.2.4 Monitoring during blood transfusions

- ***Monitoring and documentation during transfusion according to NICU Nursing Procedure: Blood transfusions by aliquots or infusion - Nursing Management in NICU (4822)***
- All babies in the Newborn Unit receiving blood, will have continuous monitoring with a heart rate monitor, with apex beat recorded hourly
- Hourly respiratory rate and heart rate
- Two hourly temperature

Note:

- As Nursing staff are always in the nursery with babies and all monitors have alarms set at normal limits, any change in condition will be quickly noted.
- Alteration in respiratory pattern is a good indication of circulatory overload in the neonate.
- The neonate is less likely to develop pyrexia, than an adult, as a response to infection or transfusion reaction.

2.3 Potential complications

- Graft versus host disease
- Cytomegalovirus

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3 Audit

3.1 Indicators

- The threshold for top-up transfusions meets 2.2.1
- Documented monitoring of the recipients physiological statement meets 2.2.4
- Blood is used within five working days following radiation

4 Patient information

Fresh blood components: Your guide to blood transfusion

5 Evidence base

5.1 Associated Waikato DHB Documents

- Waikato DHB NICU Nursing Procedure: [Blood transfusions by aliquots or infusion - Nursing Management in Newborn Intensive Care Unit \(NICU\)](#) (4822)

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