Purpose

To provide guidelines for the administration of Albumin using the syringe method in the Neonatal Intensive Care Unit.

Site Applicability

Neonatal Intensive Care Unit.

Equipment

- Patient chart with prescriber order and consent for blood transfusion
- Personal Protective Equipment (PPE): gloves, goggles, +/-gown, mask
- Chlorhexidine/alcohol swabs
- Infusion pump "brain"
- Smartsite Cap (for post transfusion CVC cap change)
- 60 mL syringe for albumin
- 18 gauge needle for aspirating albumin
- 10 mL syringe with 0.9% Normal Saline for priming & flushing the line
- Sterile green towel
- Needleless connector (cap)
- Microbore 60'' tubing

From Transfusion Medicine Laboratory (TML)

- Bottle of Albumin
- Transfusion tag attached to bottle of Albumin
- Transfusion record

<table>
<tr><th colspan="3">PRE-TRANSFUSION</th></tr>
<tr><th colspan="2">PROCEDURE</th><th>Rationale</th></tr>
<tr><td colspan="2">1. ENSURE order for blood product exists. For neonatal dosage guidelines, see table 1 below.</td><td>Blood products shall be prescribed by a health care provider with blood prescribing privileges.</td></tr>
<tr><th colspan="3">Table 1: NICU Albumin Dosage</th></tr>
<tr><th>Albumin percentage</th><th>Gram per mL</th><th>Dose</th></tr>
<tr><td>5% Albumin</td><td>1 gram = 20 mL</td><td>10 to 20 mL/kg/dose</td></tr>
<tr><td>25% Albumin</td><td>1 gram = 4 mL</td><td>2 to 4 mL/kg/dose</td></tr>
<tr><td colspan="2">2. CONFIRM that informed consent for blood transfusion is complete and current.
Informed consent need not be obtained:
• When urgent treatment is necessary to preserve a patient's life and continuing health, and
• When it is not reasonably possible to obtain consent, and
• When there is no substitute decision maker</td><td>Informed Consent is required by law for the transfusion of all albumin products.</td></tr>
<tr><td colspan="2">3. ENSURE that the guardian is aware of the planned transfusion. Explain the reason for transfusion and transfusion procedure to guardian. Provide guardian with the information pamphlet "Blood Transfusion Answers to Some Common Questions" if necessary.</td><td>Allow the guardian to prepare for the procedure. To ensure that the guardian understands the reason for transfusion and the transfusion procedure.</td></tr>
</table>

4. **PREPARE** the Blood Component/Derivative/Factor Concentrate Request Form and the Blood Release Request Form. **Give** both forms to the unit clerk and ask the unit clerk to **send** the Blood Component/Derivative/ Factor Concentrate Request Form to TML. The Blood Release Request Form is not sent to TML at this point.	*To avoid unnecessary delay in transfusion.* *This form is taken by the porter to TML when the blood product is ready for pick up.*
5. **Ensure** that a patient identification band is in place ⚠ **No identification band, No Transfusion**	*A missing identification band is a significant factor in patient misidentification and wrong product to patient incidents.* *Transfusion should not be administered to patients who lack positive identification.*
6. **ENSURE** peripheral vascular access (PIV), central vascular access line (CVC) or umbilical venous catheter (UVC) of sufficient gauge is established for the transfusion of blood product(s) based on clinical status of patient and urgency of transfusion, see table 2 below.	*Gauge or lumen size should be large enough to allow the flow within the specified administration time.*

Table 2: Intravenous Access for Administration of Blood Products

Intravenous Access	Lumen Size	Transfusion
PIV	≥ 26 Gauge	Can be used for transfusion of all blood products.
UVC	≥ 3.5 French	
Cuffed & uncuffed Central Venous Catheter	≥ 3 French	
Cuffed & uncuffed Peripherally Inserted Central Catheter	≥ *3 French*	
Cuffed & uncuffed Peripherally Inserted Central Catheter	< 2.6 French double lumen	May use **"red" lumen** for transfusion of all blood products.

7. **ENSURE** a dedicated line for the administration of albumin. • Albumin is compatible with 0.9% Normal Saline and D5W.	*To avoid inadvertent co-administration of incompatible fluids or medications*
8. **PERFORM** a pre transfusion patient assessment within 30 minutes of commencing the transfusion and **document** findings. **Measure:** • Heart rate • Blood pressure • Temperature • Respiratory rate & O_2 Saturation level Include: • Chest auscultation • A check for positive fluid balance	*Identify any clinical manifestations that may be cause for delaying the transfusion e.g. fever.* *Identify any pre existing clinical manifestations that may be confused with a transfusion reaction e.g. fever or pre-existing rash.* *Identify any existing clinical manifestations that may predispose the patient to a transfusion reaction e.g. Transfusion Associated Circulatory Overload.* *Establish baseline levels so that any transfusion-related deviations in patient's clinical condition will be recognized*
9. When TML phone to state that the blood product is ready for pick up the unit clerk will inform the RN. The RN will instruct the unit clerk to: • **Send** the porter for the blood product, or • Wait until the RN is ready to proceed with the transfusion. The unit clerk will **give** the porter the Blood Release Request Form to take to TML.	*Ensure that the person transporting the blood product obtains the right blood product for the right patient.*

NOTE: START the transfusion promptly**.** • Consult TML if there are concerns about completing the transfusion within the four hour time limit. • If the transfusion cannot be started return the blood product to TML promptly.	⚠ *Albumin is stored at room temperature.* • *To avoid unnecessary wastage*
10. **PERFORM** the pre transfusion check with second RN. **a. Visual Inspection.** The integrity of the albumin product is checked for: • Turbidity • Particulate matter • Abnormal colour • Tampered cap 🛑 **Albumin that appears abnormal should not be transfused without further investigation. Contact TML @ 7388 for an explanation of abnormal appearance.** **b. CONFIRM** that Informed Consent has been obtained. **c. Check** that the patient details on all documentation match**:** • First and last name • DOB • MRUN **on** • Admission summary in the patient chart • Physicians order • Product Tag • Transfusion record **d. Check the physician order for:** • Albumin concentration • Volume in mLs • Date on the order form • Rate or duration of infusion • Intra/post transfusion medication orders **Note:** ⚠ **Administration of 25% albumin in error, instead of 5% albumin, could result in circulatory overload.** **e. Compare details and match information on the Albumin label, the product tag & transfusion record for the following:** **Patient information:** ✓ First & last name ✓ DOB ✓ MRUN **Product information:** ✓ Concentration of albumin ✓ Lot number ✓ Expiry date & time	*To **ensure** that the **Right Patient** receives the **Right Product.*** *To detect any abnormalities that may indicate that the transfusion should not proceed.* *Consent is required for the transfusion of albumin.* *The intended patient must be properly identified prior to transfusion.* *To ensure that you are aware of the infusion rate, pre or post medication etc. that has been ordered for the transfusion.*

✓ Check for any TML comments. **f. Final check in the presence of the patient** **1.** Ask parent/guardian, where possible, to state their infant's full name and date of birth and compare to patient details on patient identification band. **2. Compare the patient details:** • First and last name • DOB • MRUN **3. With patient details on:** • Patient identification band • Product Tag • Transfusion Record **If you find any discrepancies in the patient identifiers DO NOT proceed. Contact TML @ 7388 immediately** **The product tag must remain attached to the product for the duration of the transfusion.**	*The majority of transfusion-associated mortality is due to patients receiving the wrong product, or blood intended for another patient. The bedside check is a vital step in preventing serious transfusion error. Vigilance in checking to ensure that the right product is given to the right patient is mandatory.* *If this product is not the intended product for your patient another patient may be at risk i.e. another patient may be about to receive the wrong product.*
11. **DOCUMENT** the checking procedure by signing the transfusion record. **Record:** • Signature of both staff members who carried out the pre transfusion check • Date of transfusion • Start time.	*To confirm that the pre transfusion checking procedure has been completed.*

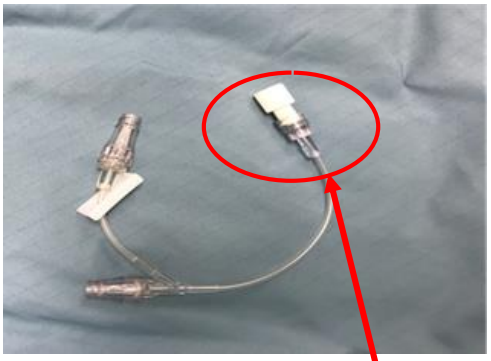
TRANSFUSION	
PROCEDURE	***Rationale***
12. Immediately after the verification checks have been completed **INITIATE** the transfusion: • **Wash** hands; apply personal protective equipment and prepare field and equipment. • **Flip** off plastic cap on top of the bottle and expose rubber stopper. • **Clean** the exposed rubber stopper with alcohol swab. • **Attach** filter needle, if supplied by manufacturer, to a sterile disposable plastic syringe. • **Insert** needle into the area delineated by the raised ring in the center of rubber stopper. The stopper should be penetrated perpendicular to the plane of the stopper within the ring. The bottle should be on a flat surface. • **Aspirate** the required volume of albumin from the bottle into the syringe. **Include** additional volume to allow for discard in the microbore tubing. • **Remove** and discard the needle from the syringe. • **Attach** the microbore tubing to the syringe. • **Remove** product tag from albumin bottle and attach to albumin syringe. • **Prime** the microbore tubing with albumin. • **Load** syringe into syringe pump and prime using prime option on pump. **Label** pump channel. • **Program** pump to run at prescribed infusion rate, see infusion rate table 3 below. • **Double-check** the programmed rate and volume to be infused. ⚠ **Do not re-enter the albumin bottle** once required volume of albumin has been aspirated into syringe. **If the dedicated access is a CVC or PICC:** • **Clamp** CVC **or PICC**. **Delay** existing infusion for the duration of the transfusion. • **Clean** connection with CHG/ALC swab, **detach** and **cap** existing infusion from CVC or PICC using a sterile white cap. • **Set** aside in sterile green towel for post transfusion reconnection. • **Clean** cap with CHG/ALC swab CVC cap and **flush** with 1mL of 0.9% Normal Saline using push-pause action and **clamp**. • **Connect** blood product line directly onto cap and **start** transfusion. **If dedicated access is PIV:** • **Clean** connection with CHG/ALC swab • **Convert** PIV to saline lock. • **Connect** blood product line to patient's IV access and **start** transfusion	*To prevent microbial contamination of product.* *The product tag must remain attached to the blood product for the duration of the procedure.* *To prevent the entry/growth of microorganisms as albumin contains no preservative.* **CVC or PICC line** **Image 1**  ⚠ **The product tag must remain attached to the product for the duration of the transfusion**

Table 3: NICU Albumin Infusion Rates		
Albumin percentage	**Gram per mL**	**Infusion Rates**
5% Albumin	1 gram = 20 mL	Over 30 minutes to 2 h
25% Albumin	1 gram = 4 mL	The maximum infusion rate is 1.5 mL/kg/h

13. **MONITORING** see table 4 below**:**

Table 4: Patient Monitoring during Blood Product Transfusion	
Remain with, or be in a position to **closely observe**, the patient for the **first 15 minutes** following the start of each unit (when product actually reaches the patient) and observe for signs and symptoms of a transfusion reaction.	
⚠ *If a severe allergic reaction such as anaphylaxis occurs, symptoms usually appear early in the transfusion.*	
Measure Vital signs:	**Vital signs** include:
• 15 minutes after the start of the transfusion • 30 minutes after the start of the transfusion • 60 minutes after the start of the transfusion • Hourly for remainder of the transfusion • Within 60 minutes of completion of the transfusion	• Heart rate • Blood Pressure ⚠ Temperature • Respiration Rate • O2 Saturation level
⚠ Temperature monitoring may be done from the incubator/overhead infant temperature probe provided that the pre-transfusion patient assessments 1 and 2 were measured by axilla thermometer and the infant probe can be trended. ⚠ Axilla temperatures must be obtained whenever there is an atypical reading e.g. suspect possible transfusion reaction.	
14. If a second bottle of albumin is required: • **NOTIFY** TML 30 minutes before it is required • **Repeat** steps 10 to13. • **Flush** intravenous access with 1 to 2 mL of normal saline 0.9% in between transfusion. • **Change** microbore tubing.	*To ensure TML staff have sufficent time to prepare next bottle of albumin.* *Decrease the risk of bacterial contamination.*
15. In the event of a suspected transfusion reaction: **STOP the transfusion immediately:** • **Disconnect** transfusion tubing from cap**.** • **Flush** catheter with 1 to 2 mL 0.9% Normal Saline. • **Start** 0.9% Normal Saline • **Reassess** patient vital signs • **Reconfirm** unique identifiers on both patient and blood product. • **Seek** assistance and **notify** physician. • **Refer** to Transfusion Reaction Procedure & Quick Reference Guide. • **Complete** Transfusion Reaction Report Form.	*To minimize patient harm.* *To keep the vein open.* *To seek direction for patient management.* *To ensure correct procedure is followed.* *To report the transfusion reaction.*
16. **COMPLETION** of transfusion. **STOP** the infusion when the prescribed volume is infused. **If the dedicated access is a CVC:** • **Clean** the connection between microbore tubing IV access. • **Disconnect** the microbore tubing and syringe	*Volume issued in the syringe allows for some discard in the microbore tubing.*

line. • **Flush** the catheter with 1 mL of 0.9% Normal Saline using pre filled syringe and clamp. • **Change** cap. • **Reconnect** and **start** previously set aside existing infusion(s). **If dedicated access is PIV:** • **Clean** the connection between microbore tubing IV access. • **Flush** the catheter with 1 mL of 0.9% Normal Saline using pre filled syringe and clamp. • **Convert** saline lock to PIV and **start** existing infusion(s).	*To ensure all the product is cleared from the connrction*
17. **DISCARD** syringe and microbore tubing in biohazard container	*Universal precautions.*
18. **DOCUMENT** **Complete the transfusion record:** • Volume infused • End time • Transfusion reaction noted: yes or no **Complete the product tag:** • Date/Time transfused • Transfused by • Transfusion reaction noted: yes or no **Complete patient notification tag section:** • Date of transfusion **Record in patients chart:** • Vital signs • Volume infused • Patient's response to transfusion • All interventions related to transfusion • If a transfusion reaction occurred record all signs and symptoms experienced by the patient	*At the time of the transfusion the patient's medical chart shall be updated*
19. **FILE** transfusion record in patient's chart.	*To ensure full traceability of the product.*
20. **GIVE** guardian the patient notification tag. The notification tag may be filed in the patient's chart and given to the guardian at discharge.	*All patients who receive a blood product should receive notification of the transfusion in writing.*
21. **RETURN** the completed product tag to TML	*To ensure full traceability of the product.*
22. **OBSERVE** for signs & symptoms of a transfusion reaction post transfusion.	*Transfusion reactions can occur after the completion of the transfusion.*

References

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Plasbumin 5% product monograph.

Alburex product monograph.

Albumin 25% product monograph.

Developed By

C&W Transfusion Safety – Transfusion safety Nurse Clinician

Version History

DATE	DOCUMENT NUMBER and TITLE	ACTION TAKEN
06-Apr-2021	C-06-12-61167 Administration Of Albumin: Syringe Method: NICU	Approved at: Transfusion Safety Committee

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