Site Applicability

BC Children’s Hospital and BC Women’s Hospital and Health Centre.

⚠️ This procedure is not applicable in NICU

Practice Level/Competencies

- Hospital orientation
- Completion of “Administration of Blood Products” module on the Learning Hub.

Policy Statement(s)

- Refer to Transfusion Standards on ePOPS.
- Emergency ward stock may be used in PICU and Emergency Department (ED)
- The transfusion must be completed within four hours of spiking the bottle.
- Do not store Albumin in medication fridges.
- Improvised warming should not be used.
- Store Albumin in it the box.

Equipment & Supplies

- Patient chart with blood product order and consent for blood transfusion
- Patient identification band
- Personal Protective Equipment (PPE): gloves, goggles, +/-gown, mask
- Chlorhexidine/alcohol swabs
- 0.9% Normal Saline, Plasma-Lyte, or D5W bag of appropriate volume
- Infusion pump “brain”

<table>
<thead>
<tr>
<th>BCCH</th>
<th>BCWH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Low Sorbing Infusion Set for the Albumin:</td>
<td>1 Primary Infusion Set for the Albumin:</td>
</tr>
<tr>
<td>• preferred set because this set has no ports</td>
<td>• WH does not have Low Sorbing Infusion Sets</td>
</tr>
<tr>
<td>• use in “vented” mode for Albumin administration</td>
<td>• use in “vented” mode for Albumin administration</td>
</tr>
<tr>
<td>1 Primary Infusion set for the rescue line</td>
<td>1 Primary Infusion set for the rescue line</td>
</tr>
<tr>
<td>Y connector</td>
<td>1 Pressure infusion extension set, 23cm /0.69 mL, (mc90004)</td>
</tr>
</tbody>
</table>

⚠️ No filter required

⚠️ Change the administration set after the ENTIRE volume has been infused, or after 12 hours, whichever comes first.

From Transfusion Medicine Laboratory (TML)

- Albumin (store albumin in its box until ready for transfusion)
- Transfusion tag
- Transfusion record

Procedure

PRE-TRANSFUSION

<table>
<thead>
<tr>
<th>STEPS</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.VERIFY Albumin order.</td>
<td>Blood products shall be prescribed by a health care provider with blood prescribing privileges.</td>
</tr>
<tr>
<td>2.ENSURE that informed consent for albumin transfusion is complete and current. Refer to Consent for Blood Transfusion Reference Guide</td>
<td>Informed consent is required by law for the transfusion of all blood products. Is the consent current? Consent for transfusion is applicable for the duration of a hospital stay, or</td>
</tr>
<tr>
<td>Informed consent need not be obtained in the following situations:</td>
<td>• When urgent treatment is necessary to</td>
</tr>
<tr>
<td>• When urgent treatment is necessary to</td>
<td></td>
</tr>
</tbody>
</table>

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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.

3. **NOTIFY** TML of planned transfusion by sending the completed Component/ Derivative/Factor Concentrate Request form to TML
   - **No cross match** or ABO required for albumin transfusion.

4. **ENSURE** that the patient/guardian is aware of the planned transfusion. **Explain** reason for transfusion and transfusion procedure to patient. **Provide** patient/guardian with the information pamphlet “Blood Transfusion Answers to Some Common Questions” if necessary

   - A missing identification band is a significant factor in patient misidentification and wrong product to patient incidents.

5. **ENSURE** intravenous access is patent and has sufficient gauge to safely administer Albumin. See table 1 below

   - Gauge or lumen size should be large enough to allow the flow within the specified administration time and to prevent cell damage

   **Table 1: Intravenous Access for Administration of Blood Products (Volumetric)**

<table>
<thead>
<tr>
<th>Peripheral Intravenous Access</th>
<th>Patient Group</th>
<th>Lumen Size</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>20-22 Gauge</td>
<td>For routine flow rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16-18 Gauge</td>
<td>For fast flow rates</td>
<td></td>
</tr>
<tr>
<td>Pediatric</td>
<td>22 &amp; 24 Gauge</td>
<td>Suitable for blood product transfusion</td>
<td></td>
</tr>
<tr>
<td>Neonatal</td>
<td>≥ 26 Gauge</td>
<td>Suitable for blood product transfusion</td>
<td></td>
</tr>
</tbody>
</table>

   **Central Venous Access Devices**

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Lumen Size</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>All</td>
<td>Suitable for blood product transfusion</td>
</tr>
</tbody>
</table>

   **Cuffed & Uncuffed Peripherally Inserted Central Catheter (PICC)**

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Lumen Size</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>3 French or greater</td>
<td>Suitable for blood product transfusion.</td>
</tr>
<tr>
<td>All</td>
<td>2 French or smaller</td>
<td><strong>DO NOT</strong> use for blood product transfusion.</td>
</tr>
</tbody>
</table>

   **Uncuffed Double Lumen 4 French PICC**

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Lumen Size</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>20 Gauge (= 3 French)</td>
<td>Suitable for blood product transfusion</td>
</tr>
<tr>
<td>All</td>
<td>23 Gauge (= 2 French)</td>
<td><strong>DO NOT</strong> use for blood product transfusion</td>
</tr>
</tbody>
</table>

6. **Preform** a pre-transfusion patient assessment **OBTAIN** baseline vital signs.
   - Heart rate
   - Blood pressure
   - Temperature
   - Respiratory rate
   - The baseline vital signs must be recorded no greater than 30 minutes before the start of the transfusion

   - Identify any clinical manifestations:
     - that may be cause for delaying the transfusion e.g. fever;
     - that may be confused with a transfusion reaction e.g. fever or pre-existing rash;
     - that may predispose the patient to a transfusion reaction e.g. positive fluid balance

   Extra assessment suggested for patients with coexisting medical conditions such as renal failure
## For patients considered high risk:
- ASSESS $O_2$ saturation level; complete a chest auscultation; and review fluid balance.

### 7. ADMINISTER
- pre medications as ordered

### 8. DOCUMENT
- findings of pre transfusion assessment including any pre-medication related to transfusion preparation, e.g. diuretics.

#### Compatibility Exception:
- If approved by a physician, co-administration of furosemide and albumin can be considered for:
  - Nephrotic Syndrome patients with edema, or
  - Patients with limited IV access
  - Use Backflow Y-connector to administer furosemide during the Albumin infusion.

### 9. ARRANGE
- for the transport of albumin.
  - Complete and send the Blood Release Request Form to TML
  - Refer to transport of blood reference guide
  - The porter service must be used to transport Albumin.

#### 10. PERFORM
- the pre transfusion patient and product checks, when the albumin arrives on the unit.
  - The pre transfusion checks must be completed by two health care providers, with required competencies, one of whom shall initiate the transfusion.

#### a) Initial check: Visual Inspection
- The integrity of the albumin 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 the abnormal appearance.**

#### b) Second check: Consent & Documentation
  - **Consent is required for the transfusion of albumin.**
  - The intended patient must be properly identified prior to the transfusion.
  - **Administration of 25% Albumin in error, instead of 5% Albumin, could result in circulatory overload.**
  - The information on the label on the albumin bottle, transfusion record and product tag must match.
  - To ensure that:
iii. CHECK the Albumin order for:
- Specific blood product e.g. albumin
- Concentration of albumin
- Volume in mL
- Date of the transfusion
- Rate or duration of infusion
- **Transfusion related** medication orders

iv. COMPARE details on the label on the albumin bottle, the transfusion record and product tag.

**Patient information:**
- First & last name
- DOB
- MRN

**Product information:**
- Concentration of albumin
- Lot numbers, including sub lot number
- Expiry date
- Check for any TML comments

The bedside check is a vital step in preventing serious transfusion error.

*If you find any discrepancies DO NOT proceed.*

**Contact TML immediately at 7388.**

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.

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.

The product tag must remain attached to the product for the duration of the transfusion.

**c) Final check in the presence of the patient.**

I. **Ask** patient/guardian, where possible, to state their full name and date of birth and **compare** to patient details on patient identification band/card.

II. **Compare the patient details:**
- First and last name
- DOB
- MRN

III. **With patient details on:**
- Patient identification band/card
- Product Tag

*If you find any discrepancies DO NOT proceed. Contact TML immediately at 7388.*

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

**TRANSFUSION**

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| 12. **Immediately after the pre transfusions checks are completed INITIATE the transfusion**
- **Return** albumin to TML if the transfusion is cancelled.
- **Consult** TML if there are concerns about completing the transfusion within four hours of spiking the bottle. | Albumin is stored at room temperature. Albumin must be protected from light during storage; however, it is not necessary to protect albumin from light during the infusion. These methods may damage the albumin and cause harm to the patient. |
13. Prime the administration set and the rescue line.
   - Use a vented administration set for Albumin.
   - **Do not open** the vent before priming, see figure 1.
   - No inline filter required.
   - The administration line can be primed with the albumin or compatible fluid.
   - The rescue line is for emergency situations.
   - Use a primary infusion set for the rescue line.
   - Y connect the Albumin and rescue line.

**Directions for Albumin line:**

- **Clamp** the line.
- **Flip** off plastic cap on top of the bottle and expose rubber stopper.
- **Clean** the exposed rubber stopper and leave to dry.
- **Place** bottle on a flat surface.
- **Insert** the spike into the area delineated by the raised ring in the center of rubber stopper at a 90° angle, see figure 2.
- **Invert** bottle immediately, gently **squeeze** and **release** drip chamber to fill to 2/3 full.
- **Open** the vent to establish flow, see figure 3.
- **Program** the pump to deliver the required volume at the appropriate rate, see table 2.
- **Confirm** the programmed rate and volume to be infused.
- **Connect** primed line to patient’s IV access.

⚠️ **Ensure** the vent is closed any time you spike a new bottle.

⚠️ **Do not** tamper with the vent.

⚠️ **Discontinue** the infusion and **inform** TML if there is any leaking from around the spike site.

⚠️ **Complete** the transfusion within 4 h of spiking the bottle.

**A vented set is required because albumin is administered from a bottle.**

If vent is open during drip chamber filling, fluid could wet the vent, resulting in slow or blocked flow and possible air bubble formation in the tubing.

<table>
<thead>
<tr>
<th>Figure 1</th>
<th>Figure 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed vent.</td>
<td></td>
</tr>
<tr>
<td><img src="image1" alt="Closed vent" /></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2" alt="Open vent" /></td>
</tr>
</tbody>
</table>

**Table 2: Infusion Rates for Non-Emergency Situations for all patients**

**INFUSE** each bottle at 1 mL/kg/h, **up to a maximum of 50 mL/h** (when product reaches the patient), for the first 15 minutes.

**ADJUST** the flow to the prescribed infusion rate, if there are no signs or symptoms of a transfusion reaction during the first 15 minutes.

<table>
<thead>
<tr>
<th>5% Albumin</th>
<th>25% Albumin</th>
</tr>
</thead>
<tbody>
<tr>
<td>As per prescribers’ orders for remainder of infusion.</td>
<td>As per prescribers’ orders for remainder of infusion. <strong>The maximum infusion rate should not exceed 1.5 mL/kg/h</strong></td>
</tr>
</tbody>
</table>

⚠️ **Infusion** rate should be adjusted to individual requirements, based on initial assessment and monitoring of the patient’s status.

⚠️ **Include** flush volume when calculating total volume to be infused.

14. **MONITORING** see table 3 below:

**INSTRUCT** the patient/guardian to inform a HCP immediately if they experience:

- **Hives**
- **Headache**
- **Nausea**
- **Difficulty in breathing**

Patients will be aware of the:

- **S&S of a transfusion reaction**
- **actions to take should they experience a transfusion reaction**
Table 3: 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 reaches the patient) and observe for signs and symptoms of a transfusion reaction.

<table>
<thead>
<tr>
<th>Neonatal (less than 4 months old)</th>
<th>Pediatric / Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measure Vital signs:</strong></td>
<td><strong>Measure Vital signs:</strong></td>
</tr>
<tr>
<td>After 15 minutes</td>
<td>After 15 minutes</td>
</tr>
<tr>
<td>After 30 minutes</td>
<td>After 60 minutes</td>
</tr>
<tr>
<td>After 60 minutes</td>
<td>Hourly for remainder of the transfusion</td>
</tr>
<tr>
<td>Hourly for remainder of the transfusion</td>
<td><strong>Post transfusion:</strong></td>
</tr>
<tr>
<td>Within 60 minutes of completion of the transfusion</td>
<td>Within 60 minutes of completion of the transfusion</td>
</tr>
</tbody>
</table>

Vital signs include:

- Heart rate
- Blood Pressure
- Temperature
- Respiration Rate
- O₂ Saturation level

<table>
<thead>
<tr>
<th>Vital signs include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate</td>
</tr>
</tbody>
</table>

- **Increase** observation for high risk patient’s e.g. clinically unstable or unconscious patients.
- **Monitor** O₂ saturation level & fluid balance in patients who are at risk of fluid overload.
- **If a severe allergic reaction such as anaphylaxis occurs, symptoms usually appear early in the transfusion.**
- Serious and life threatening reactions can occur unpredictably and progress rapidly therefore patients must be closely monitored throughout the transfusion.

15. If a second bottle of albumin is required:
   - **NOTIFY** TML 30 min before it is required
   - **REPEAT** steps 11 to 17.
   - **Change** the administration set after the entire volume has been infused or after 12 hours, whichever comes first.

   To ensure TML staff have sufficient time to prepare next bottle of albumin.

   To prevent the growth of microorganisms as albumin contains no preservative.

16. In the event of a suspected transfusion reaction:
   - **STOP** the transfusion immediately:
     - **Administer** 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 & Reference Guide and complete the 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.

17. **COMPLETION** of infusion.
   - If the full unit is ordered, **FLUSH** the administration set when the transfusion is complete and disconnect the line. **OR**
   - **STOP** the infusion when the prescribed volume is infused. **Disconnect** the line and flush connection tubing.
   - **Use** minimum volume flush for fluid restricted patients.

   To ensure all the product is cleared from the administration set.

18. **RETURN** to previously ordered intravenous solution, saline/heparin lock vascular access or discontinue IV as per prescriber’s orders.

19. **PERFORM** post transfusion blood work if ordered.  To monitor the response to the transfusion
20. **DOCUMENT**

**Complete** the transfusion record:
- Volume infused
- End time
- Transfusion reaction noted: yes or no

**Complete** the product tag:
- Date transfused
- 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 S&S experienced by the patient

At the time of the transfusion the patient’s medical chart shall be updated.

21. **FILE** transfusion record in patient’s chart.

To ensure full traceability of the product

22. **GIVE** the patient/guardian the patient notification tag section of the blood product tag. The notification tag may be filed in the patient’s chart and given to the patient/guardian at discharge.

All patients who receive a blood product should receive notification of the transfusion in writing.

23. **RETURN** the completed product tag to TML.

For units in the 1982 building, return the product tag by the internal post.

To ensure full traceability of the product.

These units are not connected to TML via the pneumatic tube system.

24. **OBSERVE** in-patients for signs & symptoms of a transfusion reaction post transfusion.

Transfusion reactions can occur after the completion of the transfusion.

25. For outpatients, **REVIEW** post transfusion care and **Give** the “Heading Home after a Transfusion” form to the patient/family. **Discharge** when clinically stable.

Patient/guardian should be aware of the potential of transfusion reactions and post transfusion care.

**Documentation**
- The transfusion record and product tag must be completed to ensure full traceability of blood components.
- The transfusion record is retained in the patient chart.
- The product tag is returned to transfusion medicine once the transfusion is complete.

**Patient & Family Engagement/Education**
- Provide the patient/guardian with the information pamphlet “Blood Transfusion Answers to Some Common Questions”, before the transfusion.
- Give the recipient notification tag to the patient/guardian after the transfusion.

**Definitions**
- Blood product (Plasma Derivative): A product derived from human or animal plasma by fractionation process, e.g. human serum albumin.
- Albumin is a plasma protein product.
References


Clinical Transfusion Resource Manual

*Standards for Hospital Transfusion Services* (Ver. 4.0). (2017). Ottawa, ON. Canadian Society for Transfusion Medicine.


Version History

<table>
<thead>
<tr>
<th>DATE</th>
<th>DOCUMENT NUMBER and TITLE</th>
<th>ACTION TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-Jun-2020</td>
<td>C-0506-12-60693 Administration Of Albumin Volumetric Method</td>
<td>Approved at: Transfusion Safety Committee</td>
</tr>
</tbody>
</table>

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