PURPOSE
To provide guidelines for the identification, management and reporting of a suspected transfusion reaction to Transfusion Medicine Laboratory (TML).

SITE APPLICABILITY
BC Children’s Hospital and BC Women’s Hospital and Health Centre

PRACTICE LEVEL/COMPETENCIES
The health care provider (HCP):
1. Demonstrates appropriate patient assessment and monitoring pre/intra/post transfusion.
2. Demonstrates accurate documentation pre/intra/post transfusion.
3. Relates knowledge of patient's baseline assessment to intra and post transfusion clinical manifestations /outcomes.
4. Applies knowledge related to suspected acute or delayed transfusion reaction
   • signs and symptoms
   • appropriate actions e.g. stop the transfusion
   • clinical management of patient
   • required patient samples
5. Demonstrates accurate documentation and reporting of the suspected transfusion reaction.

DEFINITIONS
A transfusion reaction is an undesirable or unintended occurrence during or after the administration of any blood component or product that is considered to be definitely, probably, or possibly related to the transfusion.

Acute transfusion reaction: Reaction occurs from first few minutes of transfusion up to 24 hours after the start of transfusion.

Delayed transfusion reaction: Reaction occurs more than 24 hours after start of transfusion.

Fever is defined as an oral temperature of 38°C, or axilla temperature 37.5°C, or higher and 1°C or more rise in temperature above pre-transfusion baseline.

ABREVIATIONS
Transfusion Medicine Laboratory = TML
Transfusion Reaction Report Form = TRRF
To Keep Vein Open = TKVO
Patient Safety & Learning System = PSLS
Quick Reference Guide = QRG
Clinical Signs and symptoms of transfusion reaction

A transfusion reaction is characterized by, but not limited to, one or any combination of the following signs and symptoms:

<table>
<thead>
<tr>
<th>Table 1: Signs and Symptoms of a Transfusion Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hives</td>
</tr>
<tr>
<td>Itching</td>
</tr>
<tr>
<td>Skin rash other than hives</td>
</tr>
<tr>
<td>Chills (sensation of cold)</td>
</tr>
<tr>
<td>Rigors (involuntary shaking)</td>
</tr>
<tr>
<td>Joint / muscle pain</td>
</tr>
<tr>
<td>Facial or tongue swelling</td>
</tr>
</tbody>
</table>

Fever Oral T 38°C or Higher, or axilla temperature 37.5°C, AND 1°C or more rise above baseline temp

Temperature Equivalency Table for Fever

<table>
<thead>
<tr>
<th>Temperature Equivalency Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axillary (Ax)</td>
</tr>
<tr>
<td>37.5˚C</td>
</tr>
<tr>
<td>38.5˚C</td>
</tr>
</tbody>
</table>

Equipment

- 0.9% Normal Saline or Dextrose 5% for IVIG
- Sterile dead-end cap (for administration set)
- Transfusion Reaction Report Form (TRRF) (00055606 Rev. Sept 2012)
- Transfusion Reaction Response - Reference Guide
- Requisition forms:
  - Urine Chemistry (95170 Rev. 5/93 00055597)
  - Bacteriology (L 1050 Rev. 03/10 0005197)
- 1 EDTA tube (lavender top) for transfusion reaction investigation
- Urine Specimen Container (for routine urinalysis)
- Blood Culture Bottles (for suspected bacterial contamination)
- Bio Hazard bag &/or zip lock transport bag
**TRANSFUSION REACTION**

**IMMEDIATE MANAGEMENT PROCEDURE**

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| 1 **STOP** the transfusion immediately.  
  - **Give** 0.9% Normal Saline, to keep vein open (TKVO) or prescribed rate, via rescue line for RBCs, Platelets, Plasma, Cryoprecipitate, Albumin and RhIG, **OR**  
  - **For IVIG**, give D5W TKVO or prescribed rate via rescue line.  
  **Do Not** discard the blood product administration set. | Prevents the patient receiving additional blood product  
Maintains vascular patency.  
The product bag & administration set may be needed for inspection by TML as part of the transfusion reaction investigation. |
| 2 **ASSESS** the patient’s vital signs and initiate resuscitative measures.  
  - **Vital signs include:**  
    - Pulse rate  
    - Blood Pressure  
    - Temperature  
    - Respiration rate  
    - O₂ saturation rate  
  - **MONITOR** and record urine output. | To detect any changes in patient’s clinical condition from pre-transfusion assessment.  
To stabilize the patient.  
To detect:  
- hemoglobinuria (red/brown urine evidence of a hemolytic transfusion reaction)  
- decreased urine output |
| 3 **RECONFIRM** the unique identifiers on both patient and blood product.  
  - **VERIFY** the information is identical on the patient identification band, blood product tag and blood product label.  
  - **Call TML immediately** at 7388 if an error has occurred, go step 6 page 3. | Ensures that the patient is receiving the correct blood 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** |
| 4 **CALL TML immediately** at 7388 if the patient has:  
  - New onset red/brown urine, or  
  - Sudden onset of hypoxemia, or  
  - Sudden onset of hypotension, or  
  - If you suspect bacterial contamination of the product see Table 4 page 7. | **Signs and symptoms of a severe transfusion reaction** |
| 5 **NOTIFY** the physician immediately.  
  - **Follow** the physician’s instructions for the treatment and management of the clinical symptoms. | To seek direction about patient management and stabilization. |

**Index**

- If an error has occurred, go step 6 page 3.  
- If hives &/or itching are the only symptoms, go to step 10 page 4.  
- If **fever** is the **only symptom** in an **oncology patient**, see Table 2 page 5, go to step 14 page 5.  
- For IVIG rate related signs & symptoms, see Table 3 page 6, go to step 26 page 6.  
- For all other IVIG related reactions, go to step 29 on page 7.  
- For Suspected Bacterial Contamination, see Table 4 page 7, go to step 31 on page 7.  
- Any Sign or Symptom with all Blood Products, for all patients, in all locations and any time in the transfusion, see Table 1, go to step 36 on page 8.

**An Error has Occurred**

6 **Call TML immediately** at 7388, **describe** nature of the error.  
  **For example:**  
  - Patient receiving blood intended for another patient.  
  - Patient receiving the wrong blood
TRANSFUSION REACTION
IMMEDIATE MANAGEMENT PROCEDURE

<table>
<thead>
<tr>
<th>OBTAIN patient samples, see Table 5:</th>
<th>product.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1 EDTA tube (lavender tube)</td>
<td>• Blood product past expiry date.</td>
</tr>
<tr>
<td>• sample does not need to be hand labeled</td>
<td></td>
</tr>
<tr>
<td>• First voided post-reaction urine sample and</td>
<td></td>
</tr>
<tr>
<td>• Sealed blood product bag and administration set</td>
<td></td>
</tr>
<tr>
<td>SEND patient samples:</td>
<td></td>
</tr>
<tr>
<td>• 1 EDTA tube to TML, send with TRRF</td>
<td></td>
</tr>
<tr>
<td>• Urine sample to chemistry</td>
<td></td>
</tr>
<tr>
<td>and</td>
<td></td>
</tr>
<tr>
<td>• Sealed blood product bag and administration set to TML, send with TRRF.</td>
<td></td>
</tr>
</tbody>
</table>

8 COMPLETE the TRRF, go to step 38 on page 8.

9 REPORT the error. **Complete** a PSLS

### Hives and / or Itching are the Only Symptoms

<table>
<thead>
<tr>
<th>10 If hives and / or itching, over less than ¼ of the body, are the <strong>only signs &amp; symptoms:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• STOP the transfusion and <strong>follow</strong> steps 1 to 5 outlined on page 3.</td>
</tr>
<tr>
<td>• The transfusion may be <strong>restarted</strong>, at a <strong>slower rate</strong>, if ordered by a physician, after <strong>consultation</strong> on the patient’s condition.</td>
</tr>
</tbody>
</table>

**Clinical experience suggests that patients with hives and/or itching without additional signs & symptoms may continue to receive the transfusion.**
**Reducing the rate of the transfusion and medication may ease symptoms.**

<table>
<thead>
<tr>
<th>11 IF transfusion is restarted:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Restart infusion at slower rate</td>
</tr>
<tr>
<td>• Administer medication as prescribed</td>
</tr>
<tr>
<td>• Directly observe the patient for the <strong>first 15 minutes</strong> after restarting the transfusion</td>
</tr>
<tr>
<td>• Recheck vital signs 15 minutes after restart of the transfusion</td>
</tr>
<tr>
<td>• Record vital signs:</td>
</tr>
<tr>
<td>• 60 minutes after restart</td>
</tr>
<tr>
<td>• hourly for remainder of the transfusion, or</td>
</tr>
<tr>
<td>• as per physician’s orders</td>
</tr>
<tr>
<td>• Observe for:</td>
</tr>
<tr>
<td>• Response to interventions.</td>
</tr>
<tr>
<td>• Emerging signs and symptoms.</td>
</tr>
<tr>
<td>• Deterioration in the patient’s condition.</td>
</tr>
<tr>
<td>• Transfusion <strong>MUST</strong> be completed within 4 hours of issue from TML.</td>
</tr>
</tbody>
</table>

**Ensures early detection of deterioration in patient’s condition.**
**Issue time is stamped on the Transfusion Record.**

<table>
<thead>
<tr>
<th>12 COMPLETE the TRRF; go to step 38 page 8.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No patient samples required.</td>
</tr>
<tr>
<td>• Do not return the administration set.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13 STOP the transfusion subsequent to restarting if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• signs &amp; symptoms persist, or</td>
</tr>
<tr>
<td>• new signs &amp; symptoms develop, or</td>
</tr>
<tr>
<td>• patient’s condition deteriorates:</td>
</tr>
<tr>
<td>Go to step 36 on page 8.</td>
</tr>
</tbody>
</table>

**Indicative of a moderate to severe reaction.**
TRANSFUSION REACTION
IMMEDIATE MANAGEMENT PROCEDURE

Fever is the Only Symptom in Oncology Patient only

14 If fever is the only symptom, see Table 2.

Table 2: Fever is the Only Symptom in Oncology Patient only

⚠️ For Oncology / BMT patients on 2B & 3B or in Oncology clinic only
⚠️ For patients receiving RBC, platelet or plasma transfusion only
⚠️ This policy does not apply to Hematology Patients e.g. Thalassemia patients

Authorization for restarting the transfusion in a febrile patient may be given if:
- axilla temperature is less than 38.5˚C or oral temperature is less than 39˚C, and
- fever is the only symptom, and
- the onset of fever is greater than 15 minutes into the transfusion, and
- clinical condition warrants continuation of current transfusion, and
- the physician performs a bedside clinical assessment of the patient, and
- the physician writes an order to restart the transfusion in the patient’s chart, and
- after administration of all medications as prescribed by the physician

15 STOP the transfusion and follow steps 1 to 5 outlined on page 3.

Indicative of a moderate to severe reaction.

16 ADMINISTER medications as ordered by physician.

Even if the transfusion is restarted patient samples are required.

17 OBTAIN patient samples:
- 1 EDTA tube (lavender tube)
  - sample does not need to be hand labeled
  - The sample must be collected before the transfusion is restarted.
- First voided post-reaction urine sample
  - Transfusion can be restarted before the urine sample is collected

SEND patient samples:
- 1 EDTA tube to TML, send with TRRF
  - Send sample STAT
- Urine sample to chemistry.

18 FOLLOW physician direction for restarting the transfusion.

The first 15 minutes after the restart of the transfusion are the most critical.

Ensures early detection of deterioration in patient’s condition.

Serious and life threatening reactions can occur unpredictably and progress rapidly therefore patients must be closely monitored following restart of the transfusion.

19 If the transfusion is restarted:

RESTART the transfusion at 1 mL/kg/h, up to a maximum of 50 mL/h, for first 15 minutes.
- Remain with, or be in a position to directly observe, the patient for the first 15 minutes after restart.
- Recheck vital signs 15 minutes after restart of the transfusion.
- Record vital signs:
  - 60 minutes after restart
  - hourly for remainder of the transfusion, or
  - as per physician’s orders
- Observe for:
  - Response to interventions.
  - Emerging signs and symptoms.
  - Deterioration in the patient’s condition.
- Complete the transfusion within the 4 hour time frame (4 hours from time of issue).

Issue time is stamped on the Transfusion Record.
20 **REPORT** the reaction, even if the transfusion is restarted the suspected reaction must be reported. Go to step 38 on page 8.

**All suspected transfusion reactions must be reported to TML.**

21 **STOP** the transfusion if the:

- patient’s temperature continues to rise one hour post antipyretic administration, or
- patient develops additional signs and symptoms of a transfusion reaction e.g. rigors, hypotension, or
- patient’s condition deteriorates, or
- post transfusion DAT is newly positive or there is an increase in the strength compared to the pre-transfusion DAT
- DO NOT restart

23. **Follow** steps 1 to 5 outlined on page 3.

- **Collect** patient blood cultures, if required, see Table 4, and send to microbiology
- **Send** Sealed blood product bag & administration set to TML

**Indicative of a moderate to severe reaction.**

You do not need to recollect the EDTA blood sample or urine sample if the samples were sent previously at step 17.

24. **UPDATE TML:**

- **Update** the photocopied version of the TRRF, if necessary.
- **Send** the updated photocopied version of the TRRF to TML with the sealed blood product bag.

**Update** the TRRF if the patient develops any additional signs and symptoms after the transfusion is restarted. **The TRRF does not need to be updated if** the reason for stopping the transfusion is a newly positive post transfusion DAT or an increase in the strength in the post transfusion DAT compared to the pre-transfusion DAT.

<table>
<thead>
<tr>
<th>IVIG Rate Related Signs and Symptoms that are Mild and Transient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table 3: IVIG Rate Related Signs and Symptoms</strong></td>
</tr>
<tr>
<td>Headache</td>
</tr>
<tr>
<td>Flushing</td>
</tr>
<tr>
<td>Localized rash</td>
</tr>
</tbody>
</table>

26. **STOP** the transfusion immediately and **follow** steps 1 to 5 outlined on page 3.

- The transfusion **may be restarted** at a slower rate, if ordered by a physician, after consultation on the patient’s condition.

If transfusion is restarted:

- **Administer** medication as prescribed
- **Restart** infusion at slower rate
- **Directly observe** the patient for the first 15 minutes after restarting
- **Advance** the IVIG infusion at a slower rate &/or longer intervals between rate increase

**These signs & symptoms are indicative of mild transient side effects of IVIG are:**

- Usually rate related
- Not considered a transfusion reaction

**Ensures early detection of deterioration in patient’s condition.**
TRANSFUSION REACTION
IMMEDIATE MANAGEMENT PROCEDURE

- **Record** vital signs
  - 15 minutes after restarting the transfusion
  - prior to each rate increase
  - hourly for duration of transfusion
- **Observe** for:
  - **Response** to interventions.
  - **Emerging** signs and symptoms.
  - **Deterioration** in the patient’s condition.
- **No** TTRF required
- **No** patient sample required
- **Do not** return the administration set to TML

⚠️ **Transfusion MUST** be completed within 4 hours of issue from TML.

**27. STOP** the transfusion subsequent to restarting if:
- signs & symptoms persist, or
- new signs & symptoms develop, or
- patient’s condition deteriorates

Go to step 36 on page 8.

**Indicative of a moderate to serve reaction.**

All other IVIG Related Reactions

**28. For IVIG related signs and symptoms that are moderate or severe in intensity or unresponsive to interventions.**

- **STOP** the transfusion immediately, and follow steps 1 to 5 outlined on page 3
- **Do not restart** the transfusion.
- **No** patient sample required.
- **Do not** return the administration set to TML.

**Indicative of a moderate to serve reaction.**

**29. COMPLETE** the TTRF, go to step 38 on page 8.

Suspected Bacterial Contamination

**30. SUSPECT** Bacterial Contamination of the product

IF patient has signs or symptoms A, B, C or D, see Table 4.

### Table 4: Suspected Bacterial Contamination

| A. | Fever defined as an oral temperature 38ºC, axilla temperature 37.5, or higher AND 1ºC or more rise in oral temperature above the pre-transfusion baseline. PLUS any of the following signs & symptoms. |
| B. | Fever defined as an oral temperature 39ºC, axilla temperature 38.5, or higher AND 1ºC or more rise in oral temperature above the pre-transfusion baseline even in the absence of other signs and symptoms |
| C. | Fever not responding to antipyretics |
| D. | A high suspicion of sepsis even in the absence of fever |

**31. STOP** the transfusion:
- **DO NOT** restart
- **Follow** steps 1 to 5 outlined on page 3.

**Severe transfusion reaction.**

**32. CALL TML immediately at 3387. Report** patient signs and symptoms.
### TRANSFUSION REACTION
#### IMMEDIATE MANAGEMENT PROCEDURE

#### 33. COLLECT patient samples, see Table 5:
- 1 EDTA tube (lavender tube)
- sample does not need to be hand labeled
- Patient blood cultures
- First voided post-reaction urine sample
- Sealed blood product bag and administration set

**SEND samples STAT**
- 1 EDTA tube to TML, send with TRRF
- Patient blood cultures to microbiology
- Urine sample to chemistry
- Sealed blood product bag and administration set to TML, send with TRRF.

**Post-transfusion patient blood samples are tested for:**
- Hemolysis (EDTA)
- Evidence of infection (blood cultures)

**The blood product bag and administration set are:**
- inspected by TML
- cultured for evidence of bacterial contamination

#### 34. COMPLETE a transfusion reaction report form, see step 38 on page 8.

#### Any Sign or Symptom with all Blood Products (see table 1)
**For all patients, in all locations and any time in the transfusion**

#### 35. STOP the transfusion immediately,
- **DO NOT** restart
- **Follow** steps 1 to 5 outlined on page 3.

**Indicative of a moderate to severe reaction.**

#### 36. INITIATE the transfusion reaction investigation
**OBTAIN** patient samples, see Table 5:
- 1 EDTA tube (lavender tube)
- sample does not need to be hand labeled
- First voided post-reaction urine sample
- Sealed blood product bag and administration set

**SEND** patient samples:
- 1 EDTA tube to TML, send with TRRF
- Urine sample to chemistry
- Sealed blood product bag and administration set to TML, send with TRRF.

**Patient samples required for transfusion reaction investigations.**

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### Reporting to Transfusion Medicine Laboratory

#### 37. COMPLETE sections 1 to 6 of the TRRF.
- **Photocopy** page 1 of the TRRF and
- **Retain** photocopied version of TRRF in patient chart

**The information recorded assists the:**
- laboratory staff in their investigations
- hematopathologist in reaching a conclusion

**Missing information may cause a delay in the investigation process**

#### 38. PROMPTLY send, see Table 5.
- Completed TRRF to TML
- Patient blood sample(s), if required
- Sealed blood product bag and administration set, if required.

**Post-transfusion patient blood samples are inspected /tested for evidence of hemolysis & compared to pre-transfusion samples.**
A clerical check & visual inspection is performed on the returned product.
Table 5: Requirements for TML Investigation

<table>
<thead>
<tr>
<th>Sample</th>
<th>Form</th>
<th>Send to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 EDTA tube</td>
<td>Transfusion Reaction Report Form (00055606)</td>
<td>TML</td>
</tr>
<tr>
<td>Urine (first voided post-reaction)</td>
<td>Urine Chemistry (95170-00055597)</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Patient blood cultures</td>
<td>Bacteriology (L1050-0005197)</td>
<td>Microbiology</td>
</tr>
<tr>
<td>Blood Product</td>
<td>Transfusion Reaction Report Form (00055606)</td>
<td>TML</td>
</tr>
</tbody>
</table>

39. Continue to MONITOR patient for:
- Emerging signs and symptoms
- Response to interventions
- Deterioration in patient’s condition.

Early detection of deterioration in patient’s condition.
Monitor effectiveness of interventions.

DOCUMENTATION

DOCUMENT the event, interventions taken and patient response on appropriate record(s):
- Patient flow sheet, progress/nurse’s notes

DOCUMENT on Transfusion record:
- Tick box to indicate a transfusion reaction has occurred
- Retain in patient’s chart

DOCUMENT on Product Tag:
- Tick box to indicate a transfusion reaction has occurred
- Return product tag to TML (if not already returned to TML with product)

REFERENCES


Consensus Recommendations for the use of Immunoglobulin Replacement Therapy in Immune Deficiency 2nd ed July 2009 APIIEG.

Quick Reference Guide - Response to Transfusion Reaction, August 2011, BC Provincial Model Document – BCTISS TTI.0001 Ver 2.0