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 37.5ºC, 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

<table>
<thead>
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<th>Index</th>
</tr>
</thead>
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<tr>
<td>Reaction Type / Signs or Symptoms</td>
</tr>
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<td>Hives &amp;/or itching are the only symptoms</td>
</tr>
<tr>
<td>Any Sign or Symptom</td>
</tr>
<tr>
<td>IVIG rate related signs &amp; symptoms</td>
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<td>All other IVIG related reactions</td>
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<td>Suspected Bacterial Contamination</td>
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<tr>
<td>Reporting to TML</td>
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</tbody>
</table>
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>Hives</th>
<th>Flushing</th>
<th>Heat / pain at IV site</th>
<th>Hypoxemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching</td>
<td>Headache</td>
<td>Jaundice</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Skin rash other than hives</td>
<td>Dizziness</td>
<td>Red or brown urine</td>
<td>Hypotension</td>
</tr>
<tr>
<td>Fever*</td>
<td>Restlessness / anxiety</td>
<td>Oliguria</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Chills (sensation of cold)</td>
<td>Nausea / vomiting</td>
<td>Diffuse hemorrhage</td>
<td>Shock</td>
</tr>
<tr>
<td>Rigors (involuntary shaking)</td>
<td>Chest pain</td>
<td>Back pain</td>
<td></td>
</tr>
<tr>
<td>Joint / muscle pain</td>
<td>Facial or tongue swelling</td>
<td>Wheezing</td>
<td>Shortness of breath</td>
</tr>
</tbody>
</table>

*Fever Definition

FEVER is defined as:

A TEMPORAL temperature of 38.5°C, or higher, **AND** 1°C or more rise in temperature above the pre-transfusion baseline.

An ORAL temperature 38°C, or higher, **AND** 1°C or more rise in temperature above the pre-transfusion baseline.

An AXILLA temperature of 37.5 °C, or higher, **AND** 1°C or more rise in temperature above the pre-transfusion baseline.

A RECTAL temperature of 38.5°C, or higher, **AND** 1°C or more rise in temperature above the pre-transfusion baseline.

Temperature Equivalency Table for Fever

<table>
<thead>
<tr>
<th>Oral</th>
<th>Temporal</th>
<th>Axilla</th>
<th>Rectal</th>
</tr>
</thead>
<tbody>
<tr>
<td>38°C</td>
<td>38.5°C</td>
<td>37.5°C</td>
<td>38.5°C</td>
</tr>
<tr>
<td>39°C</td>
<td>39.5°C</td>
<td>38.5°C</td>
<td>39.5°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) the form is NOT AVAILABLE in ePOPS
- each unit should have a supply, if unavailable call TML for a form
- 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
## 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 to page 8, step 34. | 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 5. | 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. |

**Hives and / or Itching are the only symptoms with all blood products**

**6 If hives and / or itching, over less than ¼ of the body, are the only signs & symptoms, with all blood products:**  
  - **STOP** the transfusion and **follow** steps 1 to 5 outlined above.  
  - The transfusion **may be restarted**, at a **slower rate**, if ordered by a physician, **after consultation** on the patient’s condition. | 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. |

**7 IF** transfusion is restarted:  
  - **Restart** infusion at slower rate  
  - **Administer** medication as prescribed  
  - **Directly observe** the patient for the **first 15 minutes** after restarting the transfusion  
  - **Recheck** vital signs 15 minutes after restart of the transfusion.
TRANSFUSION REACTION
IMMEDIATE MANAGEMENT PROCEDURE

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

8 **COMPLETE** the TRRF; go page 8, step 38.
- **No** patient samples required.
- **Do not** return the administration set.

9 **STOP** the transfusion subsequent to restarting if:
  - signs & symptoms persist, or
  - new signs & symptoms develop, or
  - patient's condition deteriorates:
    - Go to step 10.

**Any Sign or Symptom with All Blood Products; see table 1 page 2.**

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

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

12. **COMPLETE** the TRRF; go to page 8, step 38

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

13. For IVIG rate related **signs and symptoms**, see table 3, that are **mild and transient**.

14. **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.

**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.

Issue time is stamped on the Transfusion Record.

Indicative of a moderate to serve reaction.

Indicative of a moderate to serve reaction.

Patient samples required for transfusion reaction investigations.
TRANSFUSION REACTION
IMMEDIATE MANAGEMENT PROCEDURE

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
- **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.

**Ensures early detection of deterioration in patient’s condition.**

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

Go to step 16.

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

16. 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 severe reaction.**

17. **COMPLETE** the TTRF; go to page 8, step 38.

**Suspected Bacterial Contamination with all blood products**

18. **SUSPECT** Bacterial Contamination of the product IF the patient has signs or symptoms A, B, C or D; see table 4.

**Table 4: Suspected Bacterial Contamination**

<table>
<thead>
<tr>
<th>A. Fever defined as a temporal temperature of 38.5°C, or an oral temperature of 38°C, or higher PLUS any of the following signs &amp; symptoms.</th>
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</tr>
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<tr>
<td>Rigors</td>
<td>Hypotension</td>
<td>C. Fever not responding to antipyretics</td>
</tr>
<tr>
<td>Nausea/Vomiting</td>
<td>Tachycardia</td>
<td><strong>OR</strong></td>
</tr>
<tr>
<td>Shortness of Breath</td>
<td>Shock</td>
<td>D. A high suspicion of sepsis even in the absence of fever</td>
</tr>
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</table>

**Suspected Bacterial Contamination with all blood products**

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

Go to step 16.

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

16. 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 severe reaction.**

17. **COMPLETE** the TTRF; go to page 8, step 38.

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<td>Shock</td>
<td>D. A high suspicion of sepsis even in the absence of fever</td>
</tr>
</tbody>
</table>
19. **STOP** the transfusion:
- **DO NOT** restart
- **Follow** steps 1 to 5 outlined on page 3.

Severe transfusion reaction.


21. **COLLECT** patient samples; see table 6, page 8:
- 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:
- a. inspected by TML
- b. cultured for evidence of bacterial contamination

22. **COMPLETE** a transfusion reaction report form; go to page 8, step 38.

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**Fever is the Only Symptom For Oncology & BMT patients on T 8, Oncology Unit, only**

23. If fever is the only symptom, see table 5.

Table 5: **Fever is the Only Symptom in Oncology Patient only**

- **For Oncology** & BMT patients on T 8, Oncology Unit, only
- **Fever** is the only symptom
- **For patients receiving RBC, platelet or plasma transfusion only**
- *This policy does not apply to Hematology Patients e.g. Thalassemia or Aplastic Anemia patients*

**Authorization** for restarting the transfusion in a febrile patient may be given if:
- temporal temperature is less than 39.5 °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

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

*Indicative of a moderate to severe reaction.*

25. **ADMINISTER** medications as ordered by physician.

26. **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

*Even if the transfusion is restarted patient samples are required.*
## Immediate Management Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Notes</th>
</tr>
</thead>
</table>
| SEND patient samples: | • 1 EDTA tube to TML, send with TRRF  
               △ Send sample STAT  
               • Urine sample to chemistry. | |
| 27. FOLLOW | physician direction | for restarting the transfusion. |
| 28. RESTART | the transfusion at 1 mL/kg/h, **up to a maximum of 50 mL/h**, for first 15 minutes. | 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.  
Issue time is stamped on the Transfusion Record.|
| • 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). | |
| 29. REPORT | the reaction, even if the transfusion is restarted the suspected reaction must be reported. | All suspected transfusion reactions must be reported to TML.|
| 30. 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  
a. DO NOT restart | Indicative of a moderate to severe reaction.|
| 31. Follow | steps 1 to 5 outlined on page 3.  
a. Collect patient blood cultures, if required, see Table 4, and send to microbiology  
• Send Sealed blood product bag & administration set to TML  
You do not need to recollect the EDTA blood sample or urine sample if the samples were sent previously at step 26. | 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.|
| 32. UPDATE TML: | • Update the photocopied version of the TRRF, if necessary.  
33. Send the updated photocopied version of the TRRF to TML with the sealed blood product bag; go to page 8, step 39. | |
An Error Has Occurred

34. **Call TML immediately** at 7388, **describe** nature of the error.

35. **INITIATE** the transfusion reaction investigation

**OBTAIN** patient samples, see table 6:
- 1 EDTA tube (lavender tube)
- sample does not need to be hand labeled
- First voided post-reaction urine sample, **AND**
- Sealed blood product bag and administration set

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

36. **COMPLETE** the TRRF, go to step 38.

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

**Reporting to Transfusion Medicine Laboratory**

38. **COMPLETE** sections 1 to 6 of the TRRF, see appendix A.
- **Photocopy** page 1 of the TRRF and
- **Retain** photocopied version of TRRF in patient chart

⚠️ The form is **NOT AVAILABLE** in Epops, every unit should have a supply (TML may have a form)

39. **PROMPTLY** send, see Table 6.
- 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 6: 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>

40. **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)

**For example:**
- Patient receiving blood intended for another patient.
- Patient receiving the wrong blood product.
- Blood product past expiry date.

*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*
REFERENCES

CAN/CSA –Z902-10. 2nd ed The Canadian Standards Association Blood and Blood Components
Transfusion Medicine Medical Policy Manual revised 2010-07-03.
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
APPENDIX A

How to Complete the Transfusion Reaction Report Form

1. Pt and blood product checks are identical: YES or NO

2. Information that the TML & pathologist need for investigation of the

3. T8 outpatient clinic, MDU & Renal Unit are Outpatient

4. Highest temp is needed for definition of fever

5a. Record volume transfused if known estimate if volume is not known

5b. Filters or Equipment Used: tick all that apply

6a. Treatment measure taken: Click all measures that apply. Use “Other” to enter additional information.

6b: Please sign as well as print name. A print name improves identification of the contact person if follow up is required.

Diagnosis & Indication for transfusion are both needed as they may differ

Category from standardized list e.g. Medical or Obstetrics

Use Cerner Label to give patient details

C&W specific location e.g. T6 or Cedar

1. If NO, (an error has occurred) contact TML IMMEDIATELY another patient may be at risk!