Transfusion Reactions;

Recognition and Reporting is Important for Patient Safety

Blood Management Service Team

April 8, 2016
No conflict of interest to disclose
Recognize common signs and symptoms of adverse events associated with transfusion.

Understand how to manage various adverse events.

Understand the investigation and report the process of an adverse event.

Understand the importance of reporting suspected Transfusion Reactions.
Are blood transfusion reactions under recognized or under reported?

WRHA Blood Conservation Service Nursing Team (G Khuu RN BN, L Alcantara RN, A Courcelles RN, L Dyck RN BN, J Gould RN, S Paul RN BN & S Kenny RN MSc DipPH)

INTRODUCTION

Blood transfusions have become an important adjunct in health care. Nonetheless, infectious and non-infectious risks may impact the clinical outcome of the patient. A transfusion reaction is the "undesirable and unintended response to the administration of blood, blood components, or derivatives that is considered to be definitely, probably or possibly related to these products". About 0.2% to 3% of all transfusions result in a transfusion reaction. Transfusion transmitted infections have received the greatest amount of attention but are less frequent than non-infectious transfusion reactions as vigorous infectious disease preventative strategies are implemented in Canada. The majority of the reactions are non-infectious with outcomes ranging from no significant consequences to death.

Identifying and reporting blood transfusion adverse reactions are fundamental aspects of patient safety, however, transfusion adverse events are frequently under recognized and under reported. The purpose of this chart review was to determine the number of immediate transfusion reaction(s) and to identify gaps in recognition and reporting.

METHOD

Retrospective chart reviews of all patients with red blood cell transfusions admitted to facilities within the Winnipeg Regional Health Authority between 2003 and 2013. This convenience sample included transfusion records from Blood Conservation Service (BCS) referred patients or from Quality transfusion audits. These transfusion records represent patients in the gynecology, obstetrical, critical care and orthopedic surgery programs. Trained data collectors reviewed the charts for documentation related to red blood cell transfusion. Data was recorded on a standardized audit tool aligned with the Public Health Agency of Canada transfusion reaction definitions. Data on the presence of immediate transfusion reaction signs and symptoms, treatments, and evidence of reporting transfusion reaction were recorded.

RESULTS

- Total of 1705 transfusion records from the year 2003 to 2013 reviewed
- Total number of transfusion reactions suspected by the auditors was 116 cases (6.8%) see Table 1
- 41% (44/116) of these events were treated as transfusion reactions, see Table 2
- 45% (51/116) of these events were documented with only 30% (15/51) attributed to the transfusion event Table 3
- 6% of the suspected transfusion reactions were reported to the Transfusion Medicine Service and Table 3

DISCUSSION

Transfusion reactions are not infrequent. The data presented support that healthcare providers are able to recognize and manage symptoms; however, under-reporting is immediate transfusion reactions does exist. Regardless of the severity of a reaction, the Transfusion Medicine Service should be notified and additional investigations may be implemented. The purpose of transfusion reaction reporting is to identify patterns that may result in the following: product recall, donor notification and investigation and allow for tracking and trending. The reporting of transfusion reactions can significantly influence the safety of transfusion medicine practice.

The strengths of this review are that all personnel reviewing charts have been rigorously trained and have the necessary knowledge and skills to recognize transfusion reactions. Data collected in the standardized tool has been reviewed by Blood Conservation Services manager and data analyst to ensure accuracy and consistency of data collected. Some limitations to this review include the following: data charted in patient records were not the purpose of clinical care and not specific to this review; patient sampling was limited to a convenience sample. As this was a convenience sample, there were no specific exclusion criteria.

Based on the results from this review, future research could include further exploration into the barriers for healthcare staff on transfusion reaction recognition and reporting.

ACKNOWLEDGEMENTS

We would like to thank the staff of the WRHA Blood Program. No funding was received for this review.

REFERENCES

As soon as the blood began to enter his veins, he felt the heat along his arm and under his arm pits, which he had felt before. His pulse rose presently, and soon after we observed a plentiful sweat all over his face. His pulse varied extremely at this instant and he complains of great pain in his kidneys and that he was not well in his stomach, and that he was ready to choke unless they gave him his liberty....... 

When he awakened he made a great glass full of urine, of a color as black, as if it had been mixed with the soot of chimneys. 

Denis, J. 1668 An extract of a letter, Philos Trans R Soc 1668;2:617
Definition of Transfusion Reaction

* Any untoward event that occurs as a result of infusion of a blood component.
  * Immediate or delayed
  * Considered definitely, probably or possibly related to the infusion

* When any unexpected or untoward sign or symptom occurs during or shortly after the transfusion of a blood component, a transfusion reaction must be considered as the precipitating event until proven otherwise.

* Webert, K. McMaster University. 2015
## Transfusion Reaction Risk

<table>
<thead>
<tr>
<th>Adverse event</th>
<th>Risk per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild allergic</td>
<td>1 in 100</td>
</tr>
<tr>
<td>Febrile Non-Hemolytic</td>
<td>1 in 300</td>
</tr>
<tr>
<td>TACO</td>
<td>1 in 700</td>
</tr>
<tr>
<td>TRALI</td>
<td>1 in 10 000</td>
</tr>
<tr>
<td>Bacterial Contamination</td>
<td>1 in 10 000</td>
</tr>
<tr>
<td>Anaphylactic</td>
<td>1 in 40 000</td>
</tr>
<tr>
<td>Acute Hemolytic</td>
<td>1 in 40 000</td>
</tr>
<tr>
<td>Fatal Hemolytic</td>
<td>1 in 1 000 000</td>
</tr>
<tr>
<td>HIV/HBV/HCV</td>
<td>1 in 1 000 000 to 1 in 8 000 000</td>
</tr>
</tbody>
</table>
Signs & Symptoms

Circulatory

- Changes in blood pressure
- Tachycardia, arrhythmia
- Bleeding
  - Blood in urine
  - Increase in bleeding during surgery
  - Bleeding at IV site
Signs & Symptoms

Pulmonary

- Shortness of breath
- Dyspnea
- Wheezing
- Cough
- Changes on chest xray
Signs & Symptoms

Immune

- Itching
- Rash/hives
- Flushing
- Fever
- Chills/rigors
Signs & Symptoms

Other
Unexplained discomfort
Back pain
Chest pain
IV site pain

Psychological
Feeling anxious
Something bad is happening
Recognizing a Transfusion Reaction

How can you tell??
The complex clinical condition of critically ill patients could mask the symptoms of a serious transfusion reaction.

So what are some of the signs and symptoms that are unique to critically ill patients?

- Ventilated patients could have increased peak airway pressures
- Hyperthermia
- Changes in urine output or color in the context of a blood transfusion
- Patients during a massive transfusion protocol – monitoring core temperature, prompt use of measures to avoid hypothermia- using blood warmer, watch for hyopcalcemia, acidosis, and hyperkalemia
Recognition at the bedside

**Blood Product Transfusion**

**Signs/Symptoms**

- **Vital Signs Change**
  - Temp: +/- 0.5 deg C
  - RR: +/- 5 RPM
  - HR: +/- 10 BPM
  - BP: +/- 20 mmHg

**Possible Reactions**

- **Normal Response**
  - Normal Response

- **Abnormal Response**
  - HIVES/ITCHING
  - MILD ALLERGIC
  - FEVER/CHILLS
  - FEBRILE NON-HEMOLYTIC
  - HYPOTENSION
  - ACUTE HEMOLYTIC
  - BACTERIAL CONTAMINATION
  - ANAPHYLACTIC
  - ACUTE LUNG INJURY (TRALI)
  - VOLUME OVERLOAD (TACO)
Transfusion Reactions

- Febrile non-hemolytic
- Minor/Major Allergic
- Bacterial Contamination
- TRALI
- Hemolytic
- Anaphylaxis
- Hypotensive/Shock
- Acute/Delayed Reaction
- Other/Delayed Reaction
- TACO
What is a Transfusion Reaction?

* Any **untoward event** that occurs as a result of infusion of a blood component.

* When any unexpected or untoward sign or symptom occurs during or shortly after the transfusion of a blood component, a transfusion reaction must be considered as the precipitating **event until proven otherwise**.
TRANSFUSION REACTIONS ALGORITHM

Patient exhibits signs and symptoms of a transfusion reaction

1. **STOP THE TRANSFUSION IMMEDIATELY** and keep the IV line open with 0.9% saline
2. Contact the physician/authorized practitioner for medical assessment and document name of physician/authorized practitioner notified
3. Check vital signs at least every 15 minutes until stable
4. Check all labels, tags, treatment order, forms and the patient’s identification band to determine if there is a **clerical discrepancy**
5. Notify the blood bank/lab
6. Complete Transfusion Reaction Investigation Form (CM105)

**PHYSICIAN/AUTHORIZED PRACTITIONER WILL DETERMINE IF TRANSFUSION SHOULD CONTINUE**

NOTE: REACTIONS IN A PATIENT TRANSFUSED FOR THE FIRST TIME MAY BE POTENTIALLY MORE SERIOUS

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**Serious Signs and Symptoms?**

- Hypotension/shock
- Rigors
- Anxiety
- Back/chest pain
- Dyspnea/SOB
- Bleeding/pain at IV site

**Clerical Discrepancy?**

- Nausea/vomiting
- Hemoglobinuria
- Febrile and 1°C rise over baseline
- Tachycardia/arrhythmias
- Generalized flushing
- Hives/rash covering ≥25% body

IF THE PATIENT DEVELOPS ANY ONE OR MORE OF THE FOLLOWING DURING TRANSFUSION:

- DO NOT RESTART THE TRANSFUSION
- Institute patient management
- Send the following to the Blood Bank/Lab IMMEDIATELY:
  - Adults: 10-12 mL of blood in EDTA tubes
  - Pediatrics: 3 mL of blood in an EDTA tube
  - Completed Transfusion Reaction Investigation Form (CM105)
  - Blood and blood component and administration set/fluid
- Consider:
  - Blood and blood component cultures if patient temperature is ≥38°C
  - Chest x-ray for severe dyspnea
  - Urine specimen
  - Other tests as per treatment order

**Serious Transfusion Reactions:**

- Serious Febrile Non-Hemolytic
- Anaphylactic
- Fluid Overload
- Transfusion Related Acute Lung Injury (TRALI)

- Acute Hemolytic
- Severe Allergic
- Bacterial Contamination

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**Minor Symptoms?**

**Allergic reaction?**

- Hives/rash ONLY covering ≤25% body (no other symptoms)

On physician/authorized practitioner direction:

- Treat with Diphenhydramine 25-50 mg IV or PO (pediatric 0.5-1.0 mg/Kg IV or PO to a maximum of 50 mg)
- Resume transfusion cautiously
- Remain with patient and observe for the first 15 minutes after resuming transfusion

**Febrile reaction?**

- Febrile and 1°C rise over baseline
- No other symptoms AND
- Onset > 15 minutes into transfusion

On physician/authorized practitioner direction:

- Treat with Acetaminophen 650 mg PO or PR (pediatric 10-15 mg/Kg PO)
- Resume transfusion cautiously
- Remain with patient and observe for the first 15 minutes after resuming transfusion

If remainder of transfusion is uneventful, send to Blood Bank/Lab as soon as possible:

- A completed Transfusion Reaction Investigation Form (CM105)
- Blood specimens not required

**IMMEDIATELY** Stop the transfusion if patient develops any **Serious Signs and Symptoms**, follow serious signs and symptoms pathway.

**Minor Allergic Reaction**

**Minor Febrile Non-Hemolytic**

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Manitoba Transfusion Medicine Best Practice Resource Manual for Nursing • October 2006
A Transfusion Reaction is minor if:

- The hives or rash cover less than 25% of the body and there are no other symptoms
- The fever (1C rise over baseline AND higher than 38C) is associated with no other symptoms
Temp increase by > 1C AND > 38 C

1. Stop transfusion
2. Clerical check
3. Notify physician
4. Notify blood bank

Clerical error or additional serious symptoms?

<table>
<thead>
<tr>
<th>No</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No</strong> Restart transfusion cautiously as ordered</td>
<td><strong>YES</strong> Do not restart transfusion</td>
</tr>
<tr>
<td>1. Administer acetaminophen 325 mg</td>
<td>1. Suspect Hemolytic Transfusion Reaction or Bacterial Contamination</td>
</tr>
<tr>
<td>2. Continue to monitor patient carefully and frequently</td>
<td>2. Initiate Transfusion Reaction Investigation by completing form</td>
</tr>
<tr>
<td>3. Stop transfusion if symptoms worsen or additional symptoms develop</td>
<td>3. Collect blood samples</td>
</tr>
<tr>
<td>4. If uneventful complete Transfusion Reaction Investigation Form</td>
<td>4. Send blood bag to blood bank</td>
</tr>
<tr>
<td>5. Send to blood bank with blood sample as per algorithm</td>
<td>5. Continue to monitor patient and report condition to physician</td>
</tr>
</tbody>
</table>
The predominant symptom of a fever is most commonly seen in:

- Acute Hemolytic transfusion reactions (AHTR)
- Febrile non-hemolytic transfusion reactions (FNHTR)
- Bacterial Sepsis or contamination
Febrile Non-Hemolytic Reaction

Incidence
• 1 in 300 (RBC transfusion)
• 1 in 20 (Platelet transfusion)

Clinical Presentation
• Fever during transfusion or up to 4 hours after. Patient may also experience chills, rigors, nausea and vomiting and hypotension without fever.

Management:
• STOP the transfusion. Consult with ordering practitioner, may re-start transfusion cautiously if directed.
Acute Hemolytic Transfusion Reaction

Incidence
- 1 in 38,000
- Related to transfusion of incompatible ABO blood group to a patient
- Less than 10% mortality rate, risk of death related to amount of wrong blood transfused.

Clinical Presentation
- Most commonly fever and chills
- Hemoglobinuria
- Less common may have pain, hypotension, nausea/vomiting, dyspnea, renal failure, Disseminated Intravascular Coagulation (DIC)

Management
- STOP the transfusion!
- Check if any clerical errors in identifying the patient, blood group, product label
- Notify the practitioner, blood bank, return product and recollect sample from patient to confirm blood group
- Monitor patient closely
Bacterial Sepsis or Contamination

Incidence

• RBC-1 in 50 000 Bacterial Contamination, 1 in 250 000 symptomatic septic reactions and 1 in 500 000 fatal bacterial sepsis
• Platelet-1 in 1000, 1 in 10 000 symptomatic septic reactions, 1 in 60 000 fatal bacterial sepsis
• 10% of transfusion related deaths are associated with bacterial sepsis

Clinical Presentation

• Chills, Rigors, Fever, tachycardia, hypotension, n/v, SOB, DIC

Management:

• **STOP** the transfusion!
• Notify and return product to the blood bank
• **Collect blood culture samples from the patient**
• Provide supportive interventions as need based on patients symptoms, monitor closely
# Hives/Rash covering < 25% of body

**Stop transfusion**
1. clerical check
2. notify physician
3. notify blood bank

Clerical error or serious symptoms?

<table>
<thead>
<tr>
<th>No</th>
<th>Restart transfusion cautiously</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Administer diphenhydramine 25-50 mg IV/po</td>
</tr>
<tr>
<td>2.</td>
<td>Continue to monitor patient carefully and frequently</td>
</tr>
<tr>
<td>3.</td>
<td>Stop transfusion if symptoms worsen or additional symptoms develop</td>
</tr>
<tr>
<td>4.</td>
<td>If uneventful complete Transfusion Reaction Investigation Form</td>
</tr>
<tr>
<td>5.</td>
<td>No need to send blood samples or blood bag.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
<th>Do not restart transfusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Suspect Anaphylactic Reaction or Severe Allergic Reaction</td>
</tr>
<tr>
<td>2.</td>
<td>Initiate Transfusion Reaction Investigation by completing form</td>
</tr>
<tr>
<td>3.</td>
<td>Collect blood samples</td>
</tr>
<tr>
<td>4.</td>
<td>Send blood bag to blood bank</td>
</tr>
<tr>
<td>5.</td>
<td>Continue to monitor patient and report condition to physician</td>
</tr>
<tr>
<td>6.</td>
<td>May need additional investigations.</td>
</tr>
</tbody>
</table>
Incidence

* 1 in 40 000

Clinical Presentation

* Widespread rash
* Shortness of breath cough, tachycardia, flushing, anxiety

Management

* Stop transfusion, consult practitioner, antihistamine, epinephrine
* Serious
Acute pulmonary edema secondary to congestive heart failure precipitated by transfusion of a volume of blood greater than what the recipient’s circulatory system can tolerate.

- Respiratory distress and/or cyanosis associated with pulmonary edema within 6 hours of transfusion.
- Associated with hypertension, tachycardia, positive fluid balance.
- Many patients also complain of a dry cough, headache.

TACO
Managing TACO

- Stop transfusion
- **Position patient in upright position**
- Supplementary oxygen
- **Diuretics**
- Cardiac and respiratory support as required

- Initiate Transfusion Reaction Investigation
How to report

- Fill out the Transfusion Reaction Investigation Form CM105
- Nursing/Healthcare Professional is responsible for completing the form
- The completed form is forwarded to the Blood Bank
**Reason for Transfusion:** congenital CMV / low platelets

**Reaction Date:** March 9, 2016  
**Time:** 1515h

**Facility:** BRHC

**Form Completed By:**

<table>
<thead>
<tr>
<th>RN</th>
<th>Print Name</th>
<th>Classification</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Transfusion/Antenatal History**

- **Transfused:** Yes < 3 mo.
- **Pregnancy History:** Yes < 3 mo.
- **Premedication:** No

**Clinical Signs and Symptoms**

- **Chills/Rigors:** Yes
- **Hemoglobinuria:** No
- **Nausea/Vomiting:** No
- **Shock:** No
- **Fever:** No
- **Hemorrhage:** No
- **Tachycardia:** No
- **Hypertension:** No
- **Jaundice:** No
- **Urticaria:** No
- **Other Skin Rash:** No
- **Pain:** No
- **Disorientation:** No
- **Sedation:** No

**Transfused Under Anesthesia:** No

**Pre-transfusion**

- **Temp:** 37.6
- **Pulse:** 158
- **Blood Pressure:** 124/85

**Post-transfusion**

- **Temp:** 38.4
- **Pulse:** 160
- **Blood Pressure:** 136/87

**Measures Taken**

- **Analgesics:** Yes
- **Antibiotics:** No
- **Supplementary O2:** No
- **Other:**
- **ICU Required:** No
- **Antihistamines:** No
- **Steroids:** No
- **Patient Blood Culture Ordered:** No
- **Transfusion Restarted:** No
- **Mechanical Ventilation:** No

**Blood Component Transfusion Reaction (e.g. Red Cells, Plasma, Platelets, Cryo)**

- **Donor:** A
- **Red Cells:** Yes
- **Platelets:** Yes
- **Whole Blood:** No

**Product Number:** C054016 042600

**Volume Given:** 180ml

**Date/Time Started:** MAR 09 14:39

**Date/Time Finished:** MAR 09 14:40

**Expiry Date:** N/A

**Nursing Clerical Check**

- **Print Name:**
- **Date/Time:** MAR 09 15:48

**Facility Blood Bank Clerical Check**

- **Print Name:**
- **Date/Time:** MAR 09 15:48

**Blood Components Cancelled**

- **Reason:** All reactions, other than rash and/or urticaria, to any type of blood component, result in immediate cancellation of all crossmatched blood components remaining on the current Request for Blood Components requisition.
Return Remaining Blood Product to Blood Bank

- Bag will arrive with infusion set removed and port will be clamped.
- Sample from port B
Reporting Adverse Events

Why??

Nurses Love Paperwork!!
Why Report?

1. It may result in product recall;
2. It may result in donor notification and/or investigation and/or deferral;
3. It may result in recipient notification and investigation;
4. It is useful for purposes of tracking and trending (for example, a new complication or an unexpected change in frequency of a previously recognized complication);
5. It contributes to safer transfusion medicine practice.
Justice Horace Krever, the Head of the Royal Commission of Inquiry into the Blood System in Canada.
Where does the Transfusion Reaction Investigation Form go after?
Receipt of the Transfusion Reaction Investigation form triggers immediate laboratory testing on the post transfusion blood specimen and blood bag.

- Hemolysis, serological tests, antibody screen, direct antiglobulin test.
- Blood bag are examined for hemolysis and contamination.
- Additional testing may be requested such as crossmatching, phenotyping, C & S.
- Donor blood may be tested for antibodies,
Send post transfusion blood sample, and blood bag to lab along with Transfusion Reaction Investigation Form

<table>
<thead>
<tr>
<th>Post transfusion blood sample:</th>
<th>Blood bag:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemolysis</td>
<td>Hemolysis</td>
</tr>
<tr>
<td>serological tests</td>
<td>Contamination</td>
</tr>
<tr>
<td>antibody screen</td>
<td></td>
</tr>
<tr>
<td>direct antiglobulin test</td>
<td></td>
</tr>
</tbody>
</table>

Additional tests may be requested:

- Crossmatching
- Phenotyping
- C & S

Donor blood may be tested:

- antibodies
SAMPLE, TMRR
PHN: MB 000 000 000

DOB: 
Sex: Female

Medical Record Number:
Ordering Facility:
Physician:
Ward:
Receiving Facility: Brandon Regional Health Centre

Patient Summary:
Blood Group: A Positive
Known Antibodies:
Phenotype:

Sample Comments: only one tube received

Test Performed: ABO/Rh

Results: A Positive

Direct Antiglobulin Test

Negative

Transfusion Reaction Investigation (POST)

Remarks:
2016-MAR-09 @1715 Notified that there is no indication of a hemolytic transfusion reaction.

2016 MAR 23 - Medical Director's Dr Musuka comments received (TENJ WL)

Febrile non-haemolytic transfusion reaction. Blood cultures - negative.
Transfusion Reaction Investigation and Diagnosis determine what additional actions need to take place.

1. Recall of component from same donor
2. Hospital notification about potential component problem
3. Additional product testing
4. Lot number investigation
5. Donor notification, testing, & deferral

- CBS sends green copy to MB Health
MB Health (PBPCO)
- Enters and analyses data and sends anonymized subset to PHAC quarterly

Health Canada
- Tracks trends
- Transfusion Transmission Injuries Surveillance System (TTISS)
• Voluntary surveillance system for capturing moderate and severe transfusion reactions
• Collaboration with the blood suppliers
• Agreement on definitions of reactions, severity, imputability
• Agreement on what reactions need to be reported to the blood supplier as well as to TTISS
• Reconciliation of data reported to each agency
Transfusion Transmitted Injuries Surveillance System (TTISS)

2006-2012 Summary Results

Table 1A. Adverse reaction (imputability) to transfusion of blood products (plasma derivatives), TTISS 2006 - 2012

Table 2C. Relationship of adverse reaction (imputability) to transfusion of blood products (plasma derivatives), TTISS 2006 - 2012

Figure 2: Number of transfusion-related deaths (n=41), TTISS 2006 - 2012
Guidance Document: Blood Regulations

Help on accessing alternative formats, such as Portable Document Format (PDF), Microsoft Word and PowerPoint (PPT) files, can be obtained in the alternate format help section.

Published by authority of the Minister of Health

Date Adopted: 2014-05-12
Effective Date: 2014-10-23

Health Products and Food Branch

Our mission is to help the people of Canada maintain and improve their health.

Health Canada

HPFB’s Mandate is to take an integrated approach to managing the health-related risks and benefits of health related to health products and food by:
* Under the Blood Regulations, an unexpected adverse reaction or serious adverse reaction must be reported to Health Canada if it is associated with an undesirable response in the recipient to the transfused blood that indicates there is a risk to human safety or the safety of the blood.

* An establishment should refer to section 1, the Interpretation section, for the definitions of adverse reaction, serious adverse reaction, and unexpected adverse reaction when determining what must be reported as an unexpected adverse reaction or a serious adverse reaction to Health Canada. An adverse reaction caused by a blood labeling error that compromises the safety of the blood and leads to an adverse reaction in a recipient is an example of a reportable adverse reaction.

Mild transient reactions that resolve with the reduction of flow rate do not need to be reported. Infusion can safely proceed. **Do document details and consult physician as needed.**

- Acute symptoms (within 24 hours)
  - Stop infusion
  - Complete TR investigation form
  - Return product to Blood Bank

Hemolytic transfusion reactions after administration of IVIG 16/1000 patients over 2 ½ years in Ottawa Hospital

Padmore et al, 2008 Transfusion
# Delayed IVIG (Greater than 24 hours)

<table>
<thead>
<tr>
<th>Signs and Symptoms</th>
<th>Reaction Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged and severe headache that is unresolved by medication</td>
<td>Delayed Headache</td>
<td>▪ Medicate as ordered as soon as first signs of headache occur. ▪ For subsequent IVIG administration, physician may consider prehydration with saline.</td>
</tr>
<tr>
<td>Severe and incapacitating headache with nuchal rigidity, drowsiness, fever*, lethargy, photophobia, painful eye movements, nausea, vomiting, diarrhea, pharyngitis, deterioration of mental status</td>
<td>Aseptic Meningitis</td>
<td>▪ Presents up to 72 hours post transfusion. ▪ Usually resolves spontaneously in 1-2 days. ▪ Previous history of migraine headaches may be a risk factor. ▪ Pre/post medication with corticosteroids/anti-migraine medication may help to prevent/reduce incidence.</td>
</tr>
<tr>
<td>Fever*, back pain, dyspnea, red/brown urine, falling haemoglobin, jaundice, unexpected/unexplained fatigue</td>
<td>Delayed Hemolysis</td>
<td>▪ Occurring within 10 days post transfusion. ▪ Often due to antibodies in IVIG directed against a patient’s red blood cells. ▪ Blood group A, B or AB adult patients receiving more than 50g of IVIG or pediatric patients receiving 1g/kg or more are at an increased risk of hemolysis.</td>
</tr>
<tr>
<td>Peripheral edema, periorbital edema, urination changes, increased serum creatinine, hypertension, back pain, flank pain, blood in urine.</td>
<td>Acute Renal Failure</td>
<td>▪ Predisposing factors: age&gt;65; diabetes mellitus; pre-existing renal insufficiency. ▪ Usually seen with products containing sucrose (none currently licensed in Canada).</td>
</tr>
<tr>
<td>Symptoms related to: myocardial infarction; transient ischemic attack; stroke; deep vein thrombosis.</td>
<td>Thrombo-embolic events</td>
<td>▪ Causative relationship not clearly understood. ▪ Possibly related to increases in blood viscosity. ▪ Risk factors include: atherosclerosis; advanced age; previous thrombotic event; clotting disorder; hypertension; diabetes; obesity; immobility.</td>
</tr>
<tr>
<td>Variable as per specific infectious disease.</td>
<td>Transfusion Transmitted Infections</td>
<td>▪ Diagnosed through transmissible disease tests. ▪ No reported cases of HIV or HBV. ▪ No reported HCV since 1995. ▪ Effective viral reduction measures. ▪ Prion (vCJD) transmission theoretical risk.</td>
</tr>
</tbody>
</table>
TRALI cases were decreased by primary prevention

AABB published in the fall of 2007, the recommendation that “…blood collecting facilities should implement interventions to minimize the preparation of high plasma-volume components from donors known to be leukocyte-alloimmunized (i.e. donors with antibodies to leukocytes) or who are at increased risk of leukocyte alloimmunization.
* TRALI reduction measures began with the use of predominantly male plasma for production of Frozen Plasma, Fresh Frozen Plasma, cryosupernatant plasma and plasma for resuspension of platelet pools in October 2007.

* In March 2008 these measures were expanded to include predominately male apheresis plasma donations.

* On July 20, 2009 CBS began collecting apheresis platelets from males and females without a history of pregnancy.
Anaphylactic, Bacterial, TACO, TRALI Adverse Reactions and Fatalities Reported to Canadian Blood Services
2009 - 2014

2009-2014 Adverse Reactions and Fatalities Reported to Canadian Blood Services (Posted online at www.transfusionmedicine.ca in February 2015)
Why the Change?

**College of American Pathologists (CAP) Accreditation**

"Requires that the facility (CBS and DSM) has a system to reduce the risk of mistransfusion for non-emergent red cell transfusions."

(CAP citation, Jul 2015)
If a Patient has Never had a Type and Screen

The Patient will be issued Group O Blood

Please note that the issue tag (manila tag) and the Record of Transfusion (ROT) indicate component blood group O pos rather than the patients blood group.

www.bestbloodmanitoba.ca
From a land far away.....

I have given a guess at the reason of this new and unheard of way of curing, by Transfusion of Blood, in which if I have err’d let it serve for my excuse that no man has gone before me to show me the way.

Action, G. 1668     Physical reflections upon a letter. Philos Trans R Soc 1668;2
Preventing Harm

* Always complete 2 person check prior to the administration of blood products.

* Monitor patient closely to treat suspected transfusion reactions in a timely fashion.

* Report all suspected transfusion reactions to enable learning and improvement.
ANYTIME there is a suspected transfusion reaction

1. **Stop** the transfusion-keep IV line open with normal saline
2. **Contact** authorized practitioner
3. Perform thorough **assessments** frequently
4. Complete **clerical check**
5. **Notify** blood bank
6. **Complete Transfusion Reaction Investigation Form.**
“Internationally, the knowledge that there is a problem with inappropriate transfusion has been written about exhaustively. We know that blood given inappropriately leads to patient complications, even death.”

Dr. Kerry Gunn – Auckland District Health Board Blood Transfusion Committee Chair - April 2013
Choose Wisely Canada

WHY GIVE TWO WHEN ONE WILL DO?

Make Choosing Wisely your next improvement project.
Join the campaign to prevent 10 million unnecessary tests and treatments by 2020.

BLOOD IS A GIFT USE IT WISELY

WHY USE TWO? WHEN ONE WILL DO
Transfusing one unit of blood at a time reduces the risk of an adverse event – Transfuse one then reassess
TRANSFUSION REACTIONS

Reaction Investigation

Safety is the number one priority in the blood system in Canada. The Office of Provincial Renal, Transplant and Transfusion Services of Manitoba Health helps make sure Manitoba’s blood supply is safe by supervising a surveillance program and supporting training and education programs.

Transfusion Transmitted Injuries Surveillance System

The 1997 Report of the Commission of Inquiry on the Blood System in Canada (Krever Commission) led to a series of initiatives and enhanced funding to improve the safety of Canada’s blood supply. One initiative, for reporting adverse transfusion events, is the Transfusion Transmitted Injuries Surveillance System (TTISS). The Public Health Agency of Canada (PHAC) leads this program. TTISS began as a pilot project in 1999 and is now a national program that monitors transfusion reactions in Canada.

- Read more about TTISS on the PHAC website

Hospitals report adverse transfusion reactions voluntarily. Reporting allows the monitoring of known transfusion risks and new transfusion risks in the blood supply. The aim of the surveillance system is to improve transfusion processes and patient safety in Canada.

Transfusion reaction investigation process in Manitoba

The Manitoba Transfusion Expert Community has developed best practices for the treatment and laboratory investigation of transfusion reactions in Manitoba.

Provincial status

Manitoba has actively participated in TTISS. Continuing participation in TTISS is a goal of the Office of Provincial Renal, Transplant and Transfusion Services of Manitoba Health.

Related information

- Signs and Symptoms of a Transfusion Reaction
- Manitoba Transfusion Reaction Algorithm Table
Investigation of Reaction

- Once TRALI is recognized, notify bloodbank immediately
- Transfusion reaction form should be filled to initiate additional investigation
- Donors whose units are implicated will have all units removed from inventory


BC Provincial Coordinating Office November 2011

www.transfusionmedicine.ca March 2016

www.transfusionontario.org

www.publichealth.gc.ca

www.cbs.ca
Thank you
QUESTIONS?