Algorithm for Transfusion Reactions

PATIENT EXHIBITS SIGNS AND SYMPTOMS OF A TRANSFUSION REACTION

1. STOP THE TRANSFUSION!!!!
2. If patient is experiencing serious signs and symptoms, disconnect the transfusion
3. Maintain IV patency with appropriate IV fluid
4. Contact the physician for medical assessment
5. Check vital signs every 15 minutes until stable
6. Perform Clerical check to ensure there is no clerical discrepancy by verifying that the armband and blood tag match with the patient’s name and medical record number. Verify the patient’s ABO/Rh type is compatible/identical to the unit ABO/Rh type and the unit is not expired.

Serious Signs and Symptoms?

IF PATIENT HAS ANY ONE OF THE FOLLOWING:
- Onset of any symptom in the first 15 minutes of transfusion
  - Fever
  - Chills/Rigors
  - Hypotension/shock
  - Hypertension
  - Unexplained anxiety
  - Any pain
  - Headache
  - Dyspnea/respiratory distress
  - Tea colored urine
  - Bleeding from IV site
  - Nausea/vomiting
  - Tachycardia/arrhythmias
  - Generalized flushing
  - Hives/rash covering body
  - greater than ½ body
  - Patient states he/she feels unwell

NOTE: Consider bacterial contamination if the patient exhibits any of the following during or within 4 hours post transfusion:
1. Temperature rise ≥1°C and ≥38°C PLUS any of the following:
   - rigors
   - hypotension
   - shock
   - tachycardia
   - dyspnea
   - nausea/vomiting
2. Temperature rise >39°C and ≥1°C; with or without other signs or symptoms
3. Temperature rise not responding to antipyretics and/or suspicion of sepsis

CONSIDER: ACUTE HEMOLYTIC, SEVERE ALLERGIC, ANAPHYLACTIC/ANAPHYLACTOID, TRANSFUSION ASSOCIATED CIRCULATORY OVERLOAD (TACO), TRANSFUSION RELATED ACUTE LUNG INJURY (TRALI) OR BACTERIAL CONTAMINATION

Clerical Discrepancy?

1. DO NOT RESTART THE TRANSFUSION
2. Institute patient management
3. Notify the patient’s physician immediately
4. Notify Blood Transfusion Services (BTS) immediately
5. The following should be sent to BTS:
   a. Tubes of blood as per BTS reaction investigation policy *
   b. Completed Blood Transfusion Report/Tag
   c. Blood product & administration set/fluid
   d. Additional samples as requested by BTS
6. Include:
   a. Blood and product cultures (done by BTS) if bacterial contamination is suspected as indicated by physician
   b. Chest x-ray for dyspnea/ respiratory distress

Minor Symptoms?

Temperature rise ≥1°C and ≥38°C with no other signs or symptoms

BTS MUST BE NOTIFIED OF ALL SUSPECTED TRANSFUSION REACTIONS
- Consider medicating with antipyretics or Analgesics
  Note: Requires a physician order
- Document assessment and intervention on patient’s chart and on transfusion tag
- Resume transfusion cautiously ONLY as directed by physician
- Patient should be directly observed for the first 5 minutes after resuming transfusion then every 5 minutes for the next 10 minutes

IMMEDIATELY stop the transfusion if the patient develops any SERIOUS signs and symptoms

If remainder of transfusion is uneventful, upon completion the following should be sent to BTS:
  a. Tubes of blood as per BTS reaction investigation policy *
  b. Blood Transfusion Report/Tag
  c. Blood product & administration set/fluid
  d. Completed Blood Transfusion Report/Tag

Consider medicating with antihistamines or antipyretics
  Note: Requires a physician order
- Document assessment and intervention on patients chart and on transfusion tag
- Resume transfusion cautiously ONLY as directed by physician
- Patient should be directly observed for the first 5 minutes after resuming transfusion then every 5 minutes for the next 10 minutes

If remainder of transfusion is uneventful, documentation on Blood Transfusion Report/Tag should be completed and returned to BTS once transfusion is complete
ENSURE MOST CLINICALLY SIGNIFICANT INFORMATION IS DOCUMENTED ON TRANSFUSION TAG AND PATIENT’S CHART

CONSIDER: FEBRILE NON-HEMOLYTIC or MINOR ALLERGIC

http://novascotia.ca/dhw/nspbcp/cp/
### Investigation of Adverse Transfusion Reactions

<table>
<thead>
<tr>
<th>Suspected Reaction</th>
<th>Signs and Symptoms</th>
<th>Testing Requirements</th>
<th>Laboratory Tier Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor Allergic</td>
<td>Rash/hives over ≤1/4 of body with no other symptoms</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Severe Allergic/ Anaphylactic/ Anaphylactoid</td>
<td>Rash/hives with any one or more of the following: - Airway compromise (tightness in throat, hoarseness, stridor, dyspnea, cough, wheezing, hypoxemia) - Profound hypotension (loss of consciousness, circulatory collapse, death)</td>
<td>Tier Testing</td>
<td>Tier One Testing: performed to rule out hemolytic reactions.</td>
</tr>
<tr>
<td></td>
<td>Does Not Meet TTIESS Definition of a Reaction</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Temperature rise ≥1°C and &lt;38°C with no other signs or symptoms</td>
<td>Tier Testing</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Temperature rise ≥1°C and ≥38°C and/or any of the following: 1. Rigors 2. Hypotension, shock 3. Dyspnea 4. Nausea/vomiting 5. Tachycardia</td>
<td>Tier Testing</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>OR: Temperature rise &gt;39°C and ≥1°C even in the absence of other signs or symptoms</td>
<td>Tier Testing</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>OR: Temperature rise not responding to antipyretics and/or suspicion of sepsis in absence of fever</td>
<td>Tier Testing</td>
<td>None</td>
</tr>
<tr>
<td>FNHR Acute Hemolytic Bacterial Contamination</td>
<td>Any one or more of the following: Chills/Rigors, sensation of cold, any pain, headache, bleeding from IV site, nausea/vomiting, jaundice, tea colored urine, unexplained anxiety, cardiac arrhythmias, tachycardia, generalized flushing, patient states feels unwell</td>
<td>Tier Testing</td>
<td>Tier One Testing: performed to rule out hemolytic reactions.</td>
</tr>
<tr>
<td>FNHR Acute Hemolytic IVIG Headache Other</td>
<td>Any one of the following:</td>
<td>Tier Testing</td>
<td>Tier Two Testing:</td>
</tr>
<tr>
<td>Transfusion Associated Circulatory Overload (TACO) Transfusion Associated Dyspnea (TAD)</td>
<td>Shortness of breath, dyspnea, cyanosis, hypertension, respiratory distress, tachycardia, congestive heart failure during or within 6 hours of completion of transfusion</td>
<td>Tier Testing</td>
<td>Tier Three Testing:</td>
</tr>
<tr>
<td>TRALI (Transfusion Related Acute Lung Injury)</td>
<td>Acute onset of respiratory distress, during or within 6 hours of completion of transfusion, O₂ Saturation less than 90% on room air, bilateral lung infiltrates confirmed by Chest X-Ray, No evidence of circulatory overload</td>
<td>Tier Testing</td>
<td>Samples required for Tier One Adverse Reaction Investigation</td>
</tr>
</tbody>
</table>

**Note:** Consider signs and symptoms and investigation required for other suspected/delayed transfusion reactions

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**Testing Requirements**

**Tier Testing**

- Clerical check for procedural or identification errors
- Visual check of post-transfusion serum for hemolysis
- Perform ABO/Rh on post-transfusion sample and compare to pre-transfusion sample ABO/Rh
- Direct Antiglobulin Test (DAT) on post-transfusion sample *
- Request urine sample (if above test results suggest a hemolytic event)

**Reports**

Alert the hematopathologist/attending physician if Tier one testing is positive or if a Hemolytic Event is suspected. Proceed to Tier two testing if indicated by the hematopathologist.

**Tier One Testing**

- Repeat pre-transfusion sample ABO/Rh
- DAT on pre-transfusion sample *(if post-transfusion DAT is positive)
- Perform ABO/Rh type & DAT on the unit in question*
- Repeat Antibody Screen on pre/post samples
- Perform antiglobulin crossmatches on the pre and post blood specimens with the unit(s)
- Perform urine dipstick for hemoglobin

When results are indicative of a Hemolytic reaction continue to Tier three testing as appropriate, based on findings.

**Tier Two Testing**

- Antibody Investigation (phenotype donor unit & pre-transfusion sample)
- Eluate (pre and post samples)
- Antibody Investigation on donor units
- Antibody Investigation on donor units
- Investigate transfusion technique and blood component storage conditions*
- Other tests that may be considered to categorize the adverse reaction may include: CBC, coagulation studies, serum urea/creatinine, Haptoglobin, LDH, bilirubin, electrolytes, serology, virology, iron studies, TRALI investigation.

*Items to be sent if referring DAT testing

**Tier Three Testing**

- Complete lab/facility specific adverse reaction forms.
- Complete lab/facility specific adverse reaction forms.