Investigation of Transfusion Related Adverse Events

Signs and Symptoms	Testing Requirements	Suspected Reaction
Rash/hives over ≤ 1/4 of body **with no** respiratory symptoms	**None**	**Minor Allergic**
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)	**Tier Testing Consider:** • Haptoglobin • Chido/Rogers • Serum IgA	**Severe Allergic/ Anaphylactic/ Anaphylactoid**
Temperature rise **≥1°C and <38°C with no** other signs or symptoms and onset greater than 15 minutes into transfusion	**N/A unless requested by Medical Director/Designate**	**N/A**
Temperature rise **≥1°C and ≥38°C with no** other signs or symptoms	**Tier Testing**	**Febrile Non-Hemolytic Reaction (FNHR)**
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 **OR:** Temperature rise **>39°C and ≥1°C** even in the absence of other signs or symptoms **OR:** Temperature rise not responding to antipyretics **and/or** suspicion of sepsis in absence of fever	**Tier Testing** • **Blood Cultures from different IV site** • **Product Cultures (Include a Gram Stain)**	**FNHR** **Acute Hemolytic** **Bacterial Contamination**
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	**Tier Testing**	**Acute Hemolytic** **IVIG Headache** **Other**
Any one of the following: -Drop in systolic BP greater or equal to 30 mmHg -Systolic less than 80 mmHg -Signs of shock Advise TM if patient on ACE Inhibitors *****In Pediatrics look for any significant change in BP***	**Tier Testing**	**Hypotensive Reaction** *****(Hypotension in Pediatrics is highly variable)***
Any one of the following: Shortness of breath, dyspnea, cyanosis, hypertension, respiratory distress, tachycardia, congestive heart failure during or within 6 hours of completion of transfusion	**Tier Testing AND Chest X-Ray**	**Transfusion Associated Circulatory Overload (TACO)** **Transfusion Associated Dyspnea (TAD)**
Acute onset of respiratory distress, during or within 6 hours of completion of transfusion, O_2 Saturation less than 90% on room air, bilateral lung infiltrates confirmed by Chest X-Ray, No evidence of circulatory overload	**Tier Testing AND Chest X-Ray Initiate TRALI Investigation**	**TRALI (Transfusion Related Acute Lung Injury)**

Key: ≥: Greater than or equal to <: Less than >: Greater than CBC: Complete Blood Count
LDH: Lactate Dehydrogenase CBS: Canadian Blood Services SOP: Standard Operating Procedure
TTISS: Transfusion Transmitted Injuries Surveillance System TM: Transfusion Medicine

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

June 2024

Laboratory Tier Testing

Note: Possible exception for pediatric patients: lab testing will be performed at discretion of Physician

Tier One Testing- *performed to rule out hemolytic reactions.*

- 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)

Alert the Medical Director/Designate if Tier one testing is positive or if a Hemolytic Event is suspected. *Proceed to* ***Tier two*** *unless otherwise indicated by the medical Director/Designate.*

Reports

If Tier one testing is negative, generate a report to support ongoing transfusion. If Tier one testing is positive, investigation must be complete prior to any further transfusion. Further release can only occur with the approval of the Medical Director/Designate.

Tier Two 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 or perform* ***Tier three testing*** *as appropriate, based on findings.*

Tier Three Testing

- Antibody Investigation (phenotype donor unit & pre-transfusion sample)
- Eluate (pre and post samples)
- 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.

****If referring DAT testing to another facility, send 1 EDTA***

Samples Required for Tier One Adverse Reaction Investigation
1 EDTA 1 clotted
Samples required for TRALI Investigation
Pre-transfusion: 1 clotted specimen (if not available EDTA should be sent)
Post Transfusion: 1 clotted **and** 1 EDTA
TM may request additional samples.
Refer to*– provincial SOP *PPR-P-TM-0008 Error or Accident and Adverse Reaction Investigation and Reporting.