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| **University of Washington,**  **Harborview Medical Center**  **325 9th Ave. Seattle, WA, 98104**  **Transfusion Services Laboratory**  **Policies and Procedures Manual** | **Original Effective Date:**  April 1st 2011 | **Number:**  **5411-6** |
| **Revision Effective Date:**  5/15/2014 | **Pages:**  **5** |
| TITLE: Transfusion Reaction Investigation | | |

**Purpose**: To describe the evaluation, testing process, review and reporting of Transfusion Reaction Investigations (TRI)

**Policy:** Any untoward symptom occurring during or subsequent to the transfusion of blood or blood components should be considered a potential part of a life-threatening reaction.

**Process:**

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| **Step** | **Action** | | **Related Documents** |
| **Initial Notification** | | | |
| **1** | * Receive call on a possible transfusion reaction. * Call transferred to technologist or lead technologist. * The technologist will identify the following:   + Whether the transfusion was completed or stopped.   + Date and time of reaction   + Patient name, HID and location   + Name of nurse/clinician reporting the transfusion reaction   + Symptoms of suspected reaction   + Have any un-transfused products returned immediately.     - ***Note****: If reaction is associated with hypotension, anaphylaxis, chest pain, flank pain, abdominal pain, pain at the site of infusion, severe respiratory distress or a rise in T ≥ 1***o***C or ≥ 38***o***C, contact Transfusion Services Medical Director or Resident/Covering Physician immediately.* | |  |
| **2** | * + - * Advise the nurse that they must send the following to Transfusion Services: * Suspected Transfusion Reaction Notification and Workup Request form (TRRX Form) * Copy of Transfusion tag, if available * Product bag of transfused unit with attached infusion set/IV tubing and intravenous fluids   + If the decision is made to discontinue the transfusion without the possibility of re-starting the component following evaluation.   + OR once the transfusion is completed * Post transfusion sample drawn in pink top EDTA tube * ***Note****: If symptoms limited to Temperature rise < 1oC without any other change in clinical status or mild urticarial rash, hives, redness or itching/pruritus,* ***document reaction******in SQ and on Investigation Form*** *but no serologic investigation required. A sample is not required for these two symptom categories.* | | * + - * Suspected Transfusion Reaction Notification and Workup Request form       * Suspected Transfusion Reaction Investigation form (STRI) |
| **Step** | **Action** | | **Related Documents** |
| **Receipt and Evaluation** | | | |
| **3** | * + - * Perform computer order entry: TRRX battery. Order is always STAT. | | * + - * Computer Entry of Blood Requests |
| **4** | * + - * Take request form, sample (if received), and product bag (if received) to a Clinical Technologist for emergency processing. | |  |
| **5** | * + - * Hold all in process orders.       * Further type specific blood products may not be issued without approval from Transfusion Services Medical Director or Resident/Covering Physician (unless symptoms limited to Urticaria, rash, flushing, itching/pruritus and/or temperature rise <1oC without any other change in status).   ***⮞ Note:*** *The patient may ONLY receive emergency release universal donor RBC & plasma (O RBCs, AB plasma), or group AB, A or B platelets until a hemolytic transfusion reaction has been ruled out.* | | * Emergency Blood Product Release |
| **6** | * Evaluate clinical signs and symptoms | |  |
| **If** | **Then** |  |
| * Symptoms are incomplete or question “back to baseline” is not answered | * + - Contact the clinical care staff to obtain further information |  |
| Symptoms limited to:   * Mild Allergic Reaction, i.e: * Rash   + Urticaria   + Flushing   + Itching/pruritus * Temperature rise <1oC | * Further blood products may be released without requiring Transfusion Services Medical Director or Resident/Covering Physician approval |  |
| * Symptoms do **not** suggest a mild allergic or a Temperature rise <1oC | * Further blood products cannot be released without Transfusion Services Medical Director or Resident/Covering Physician approval |  |
| * Symptoms suggest severe transfusion reaction   o Rise in temperature of  >10C or ≥38C  o Back/flank, chest, or  abdominal pain  o Pain at infusion site  o Hypotension  o Respiratory distress   * Anaphylaxis * Gram Stain Positive | * Notify Transfusion Services Medical Director or Resident/Covering Physician immediately * Further blood products cannot be released without Transfusion Services Medical Director or Resident/Covering Physician approval |  |

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| **Step** | **Action** | **Related Documents** |
| **Phase 1 Testing: Clerical, Hemolysis Check, Serologic, and Culture** | | |
| **7** | * Utilizing a Suspected Transfusion Reaction Investigation form (STRI), perform and record findings for the investigation. * Perform clerical check of the following, if applicable: * Post-transfusion sample * Suspected Transfusion Reaction Notification and Workup Request Form (TRRX form) * Computer record * Transfusion Tag/Unit Label * Autologous or Directed Bag Tag, if applicable * Pre-sample if discrepancy found * If there is any discrepancy request a redraw and notify the Transfusion Services Medical Director or Resident/Covering Physician * Result Clerical Check test in SQ: * [CLCKP] for passed clerical check * [CLCKF] for failed clerical check * Result Clerical Check on the STRI form * No Discrepancy * Discrepancy: describe findings * Add Comments if applicable | * + Blood Order Processing   + Suspected Transfusion Reaction Investigation form |
| **8** | * + Result test “UNO” (free text field) and STRI form: * Enter unit number or “multiple” * Add component type: RBC, PLT, Plasma, Cryo   + If the product bag is received, examine the bag, residual product, and attached administration set and IV fluids if submitted   + Record findings on the STRI form.   + Add Comment test and record results in SQ.   + If bag is not received, indicate in Comments and on the STRI form.   + **Note:** Store transfusion reaction related unit bags and attachments on the Transfusion Reaction Shelf as soon as possible to preserve condition | SQ Blood Order Processing Test Result Guide |
| **9** | * + - **If Rise in temperature of ≥10C or ≥ 38C**        * Submit appropriate order and request to Microbiology for unit gram stain and culture when:         + No medical director order required         + Medical Director requests submission to Microbiology     - If Gram Stain reported Positive,       * Call Medical Director immediately.       * Notify blood supplier. | Blood Product Culture form  Table B |
| **10** | * + Perform Phase 1 testing on post-transfusion sample   + Hemolysis check of post-transfusion specimen (POSTSP)   + Direct Antiglobulin test (DAT) with Polyspecific AHG (DBS, DIG, DCD)   + ABO/Rh (ABR)   + Record results in the LIS. | * + STRI form   + Computer system   + SQ Blood Order Processing Test Result Guide |
| **Step** | Action | Related Documents |
| **Phase 1 Testing: Clerical, Hemolysis Check, Serologic, and Culture (continued)** | | |
| **11** | * If the ABO/Rh matches the pre-transfusion results, and there is no visible hemolysis, and the DAT is Negative   + Report to the clinician or nurse: “No evidence of a hemolytic transfusion reaction”   + Record phone call on TRRX form.   + Contact the Transfusion Services Medical Director or Resident/Covering Physician and obtain approval for the patient to receive further/routine blood products   + Enter into BBC comments the statement: “Patient Approved/Not Approved to receive further blood products” |  |
| **Phase 2 Testing: Evidence of Hemolysis and/or a Positive DAT** | | |
| **12** | * + - If there is any evidence of hemolysis and/or a positive DAT:       * Notify the Transfusion Services Medical Director or Resident/Covering Physician immediately:       * Perform Phase 2/extended testing as directed by the Transfusion Services Medical Director / Resident / Covering Physician.         + Pre-transfusion sample hemolysis check         + Pre-transfusion sample DAT         + Pre/Post transfusion sample eluate         + Pre-transfusion sample ABO/Rh         + Post-transfusion sample antibody screen/identification         + Pre-transfusion sample antibody screen/identification         + Pre/Post-transfusion sample compatibility testing (donor retention sample/segment from blood bag)         + Blood product culture         + PSBC referral   Notify the Transfusion Services Medical Director or Resident/Covering Physician of results  Determine if patient approved to receive further blood products   * + - Record results in the LIS:       * Pre-transfusion sample hemolysis check (PRESP)       * Pre-transfusion sample accession number (PRETX) | * + - ABO/Rh by Tube Method     - Antibody Screen by Tube Method     - Crossmatch by Tube IAT Method     - Antibody Panel by LISS IAT     - DAT by Tube Method     - SQ Blood Order Processing Test Result Guide |
| **TRALI Investigation** | | |
| **13** | Suspected TRALI--After consultation with Transfusion Medical Director or physician on call:   * Search product inventory for other components with the same unit number, and quarantine any that are found. * Call PSBC to notify them about the unit in question and possible TRALI. * Consult with medical director or physician on call to order HLA type on recipient. |  |
| **Notification of Supplier** | | |
| **14** | * The collecting facility is notified immediately by the Medical Director when there is a fatality or serious adverse event that may be related to the product or donor of a transfused product. * The notification must subsequently be done in writing. |  |

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| **Step** | Action | Related Documents |
| **Delayed Hemolytic Transfusion Reaction (DLHRX) Investigation** | | |
| **15** | * Investigate transfusion history for **all DAT Only orders and Problem Investigations that have a POS DAT result** * If patient has been transfused in the last 4 months, the potential for delayed transfusion reaction exists and must be investigated:   + Perform parallel DAT on Pre-Transfusion sample, if available.   + Perform PEG antibody screen on Post-Transfusion sample.   + Perform PEG antibody screen on Pre-Transfusion sample, if Post is POS.   + Perform eluate(s) as indicated per SOP. * Complete ABID worksheet and Eluate Testing Form. * If the Elution is positive: * Antigen type the donor unit(s) for the antigen to the antibody eluted, using the retention segment, if available. * Notify the Medical Director immediately.   + - If Medical Director determines that DLHRX has occurred: * Order TRRX * Enter results of investigation. * Result Interpretation as DLHRX * Result TXPath once the Path Consult report is finalized...   + - Record all conversations, inquiries and observations on the TRRX form. | * DAT by Tube Method * Antibody Screen by PEG Tube IAT Method * Eluate Testing Guidelines * Antibody Elution Using Gamma ELUkit |
| **Investigation Completion** | | |
| **16** | * + - Request a 2nd technologist to review workup and SQ entry.     - Record review on the STRI form |  |
| **17** | * + - Route completed TRRX form to the CT Lead or TS Manager:       * Final TRI posted to the patient’s record       * Final report routed to the patient’s chart |  |
| **18** | * + - Result TXRINT with the U.S. Biovigilance designation, based on the medical director’s review.     - After Medical Director has completed the consult, result TXPath, with the code JDJ.     - Discard blood bag | Table A |

**Table A: U.S. Biovigilance Network Adverse Reactions**

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| **SQ Code** | **Type of Reaction as listed by US Biovigilance Network** |
| **DLHRX** | Delayed hemolytic transfusion reaction |
| **DSTRX** | Delayed serologic transfusion reaction |
| **HYTRX** | Hypotensive transfusion reaction |
| **OTH** | Other |
| **PTPUR** | Post transfusion purpura |
| **TAGVH** | TA-Graft versus host disease |
| **TRALI** | Transfusion related acute lung injury |
| **TRDYN** | Transfusion related dyspnoea |
| **TRPUNK** | Unknown pathophysiology |
| **TXALL** | Allergic Reaction |
| **TXCULT** | Transfusion associated infection (bacterial, viral, parasitic, other) |
| **TXFEB** | Febrile non-hemolytic transfusion reaction |
| **TXHEM** | Acute hemolytic transfusion reaction |
| **VOLO** | Transfusion associated circulatory overload |

**Table B: Microbiology – Gram Stain and Culture**

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| **Step** | **Action** | **Related Documents** |
| 1 | * Complete form:   + Check type of component   + Accession Number of Crossmatch Order   + Unit number (separate forms for each unit)   + Date submitted to Microbiology   + Patient Name, HID and DOB | Microbiology Blood Component – Gram Stain & Culture |
| 2 | Make a copy of the Microbiology form for the TRRX folder. |  |
| 3 | Deliver the unit and form to Microbiology Receiving, GWH |  |
| 4 | Microbiology process:   * + Assign HID to order using “HTSL –“ plus patient’s HID   + ***Example:*** *HTSL – 1232345*   + Perform Gram Stain STAT   + Set up culture   ***Note****: Results will NOT display in ORCA/EPIC under the patient HID.* | Suspected Transfusion Reaction Investigation form (STRI) |
| 5 | * Record Gram Stain verbal result on the STRI form * Print a copy of the Gram Stain report from SQ Laboratory Inquiry:   + Search by HTSL number   + Record Accession Number on the Gram Stain report |  |
| 6 | * Record in BBC Comments on the TRRX battery:   + “Submitted to Microbiology”   + Gram Stain results, i.e. “Gram Pos Cocci” and date of results. |  |
| 7 | Hold TRRX folder in the black organizer until the final Microbiology report is printed and resulted in SQ as a BBC comment. |  |

**References**

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Roback J (ed). Technical Manual, 16th Edition. AABB Press, Bethesda, MD. 2008.

Popovsky MA (ed). Transfusion Reactions, 3rd Edition. AABB Press, Bethesda, MD. 2007.