Northern Arizona Healthcare Verde Valley Medical Center	**CLINICAL LABORATORY** POLICIES AND PROCEDURES	**Department: BLOOD BANK** **Number:** **772.0-Blbk-gu-rev11/15**

INVESTIGATION OF POSSIBLE TRANSFUSION REACTION

POLICY:

1. The purpose of the investigation of possible transfusion reactions is to:
    a. Determine whether a reaction is occurring
    b. The type of reaction that is occurring
    c. If so, the cause of the reaction
    d. To provide information that will assist the attending physician in appropriate treatment of the patient.
2. Reactions that are limited to only Urticaria are not investigated by the Laboratory.
3. Transfusion reaction investigations are completed by the Laboratory as soon as possible.
4. If a hemolytic reaction has occurred, the Pathologist must be notified prior to further issue of blood.
5. The transfusion reaction workup documentation is completed on the Transfusion Reaction Worksheet.

PROCEDURE:

1. If a transfusion reaction is suspected, STOP the transfusion immediately. A transfusion reaction investigation work-up is initiated by nursing staff. This includes a non-hemolytic reaction and excludes localized Urticaria.
    a. The Blood Bank is then notified by phone call of the suspected reaction.
    b. The blood bag and tubing, along with the Transfusion Reaction Worksheet with Part 1 completed is returned to the Laboratory.
    c. A post transfusion urine specimen is collected and transported to lab as soon as possible.

2. Collect the following specimens from the patient, preferably by venipuncture. A line should only be used when venipuncture is very difficult.
    a. Draw a 6.5 mL pink top EDTA tube, taking care to not hemolyze the specimens.
    b. Draw one set of Blood Cultures from the patient.
    c. All tubes must be labeled with the correct number from the patient's blood bank armband, patient name, hospital number, time and date drawn, and initials of the person drawing the blood.
    d. The labeling information taken from the armband of the transfused patient is very crucial because it will also serve as a "bedside" check of the identity of the patient (to be checked in Laboratory against the original specimen, blood bag labeling, requisition, and blood bank records).

3. The transfusion investigation occurs in three parts.
   a. The reaction investigation begins when any of the symptoms listed on the Transfusion Reaction Worksheet are demonstrated by the patient.
      1) The transfusion is stopped immediately by the patient's nurse, and the patient's nurse then notifies the attending physician for further instructions.
      2) The physician will then order the investigation of the possible transfusion reaction if indicated.
      3) Nursing staff then notifies the blood bank of the reaction and completes Part 1 of the Transfusion Reaction Worksheet, including the symptoms the patient was having and the pre and post transfusion vitals, and sends it to the blood bank along with the unit of blood.
   b. Section II is completed by the Blood Bank and includes the preliminary investigation.
   c. Section III is also completed by the Blood Bank if Section II has positive findings.

4. Testing is performed according to the Transfusion Reaction Worksheet.
   a. All blood bank work is recorded on the Transfusion Reaction Worksheet. Blood Bank tech is to document Lawson ID and date and time at the top of Part 2.
   b. If the patient has received multiple units and it is unclear which unit may be causing the reaction, all suspect units will be included in the donor unit testing.
   c. The Basic Laboratory Investigation (Part II) includes the following elements and procedures:
      1) Recheck of patient identification and blood type reactions and interpretations on both pre and post specimens.
      2) Recheck of donor unit identification and blood type.
         Note: Blood Bank technologist performing clerical check of patient and donor information/identification is to document check on worksheet, Discrepancy (Yes/No), on first line of Part 2.
      3) Visual inspection of pre and post-transfusion specimen for icterus and hemolysis
      4) Direct Antiglobulin test on pre and post-transfusion specimen.
      5) Post-transfusion urine for color, occult blood, and the presence of RBC's microscopically.
      6) Make a copy of the Transfusion Reaction Worksheet and send the copy and the blood product to Microbiology for testing and place a checkmark in the box next to "Send to Microbiology".
      7) Culture and gram stain on the donor unit.
      8) Blood Culture collected from patient.

5. Part II results evaluation:
   a. If Part II results on the Transfusion Reaction Worksheet are positive, notify the pathologist immediately, and continue with Part III, the Extended Laboratory Investigation.
   b. Blood detected on the UA is considered positive.
   c. If the patient had a pretransfusion UA performed, an increase in occult blood detected on the dipstick > 1 grade would be considered positive.
   d. If Part II results are negative, send the Transfusion Reaction Worksheet to Pathology for Preliminary review. Place a checkmark in the box next to "Send to Pathology for Preliminary Review".

6. The extended laboratory investigation (Part III) consists of the following tests and procedures:
   a. Immediate Spin and Coombs crossmatch repeated on pre-transfusion specimen
   b. Immediate Spin and Coombs crossmatch performed on post transfusion specimen
   c. Antibody screen repeated on recipient pre-transfusion specimen
   d. Antibody screen performed on recipient post-transfusion specimen
   e. Serum or plasma total bilirubin at 5 hrs and 24 hrs post-transfusion
   f. Serum or plasma creatinine at 5 hrs and 24 hrs post transfusion
   g. Antibody screen on donor unit (if requested by Pathologist only)

7. When the indicated initial testing is completed by the Blood Bank on the Transfusion Reaction Worksheet:
   a. Send the worksheet to the Pathologist for Preliminary Interpretation within the next business day. Microbiology and possibly Chemistry testing (if Part 3 is indicated) will be pending at this point and will follow. These reports can be attached as they are finalized.
   b. After Preliminary Review, the original copy is retained in the Blood Bank, and a photocopy in Microbiology until the cultures have been completed.
   c. Microbiology will then return the copy of the worksheet with culture results to the Blood Bank.
   d. After all testing is complete, the forms are returned to the Pathologist for the Final Interpretation.
   e. After the Final Interpretation, the original copy is sent to the nursing unit the patient is located on for charting (or Medical Records if the patient is discharged).

8. After the transfusion reaction is completed, if a hemolytic reaction has occurred and more units of blood remain to be transfused:
   a. The units must be crossmatched, or re-crossmatched if already set up, using the post-transfusion reaction specimen.
   b. Re-crossmatching RBC's is not required if the reaction was in response to a non-cellular component such as platelets or FFP.

9. If it is determined a reaction has occurred, a VVMC "Occurrence Report" is entered into the Midas RDE Quality Management Program.

10. If the reaction is suspected to be due to an attribute specific to the donor or the processing of the blood product, report the event to UBS by completing the following forms:
    a. *Report of Transfusion Adverse Reaction* (BS 962): Complete if bacterial contamination, Transfusion Related Acute Lung Injury (TRALI), or any other adverse event is suspected, and return to Blood Systems, Inc.
    b. *Transfusion Associated Infection* form (BS 314): Complete if transfusion associated viral infection such as West Nile Virus, or infection by any other organism, such as Trypanosoma cruzi (Chagas' disease) is suspected and return to Blood Systems, Inc.
    c. If the results of checks and tests outlined on the Transfusion Reaction Report form indicate a possible mislabeling of the blood product by United Blood Services (UBS), notify the head of UBS Hospital Services department at 1-800-288-2199 Ext. 5470 for instruction in reporting.

11. UBS is taking measures to reduce the risk of TRALI by increasing restrictions for plasma donors (See attached Memo from UBS).

12. Fatalities resulting directly from transfusion complications must be reported to the FDA, Bureau of Biologicals within 24 hours by phone at 301-594-1191(If phone # has changed, call United Blood Services for current information), and within 7 days by written report. Report to:

    Director
    Office of Compliance
    Center for Biologicals Evaluation and Research
    1401 Rockville Pike
    Rockville, MD 20852-1448

13. Place units and tubing returned due to a potential transfusion reaction in a secondary plastic biohazard bag and store on the quarantine shelf of Blood Bank refrigerator #1 (BB1) refrigerator. When the transfusion reaction work-up is closed, dispose of them in a large red hard plastic (Sharps) biohazard container.

14. The Medical Director will follow-up with the medical staff concerning any patient who has experienced a significant reaction during transfusion.
    a. In the case of a non-hemolytic reaction, a plan is developed to minimize reaction in the future.
    b. In the case of hemolytic reaction, the Medical Director, attending physician, and nursing staff work as a team to monitor the patient's clinical symptoms, Laboratory results, and progress.
    c. The Medical Director and Blood Bank technologists work together to be certain all appropriate post-transfusion testing and reporting has been done to assure thorough investigation.

REFERENCES:

1. American Association of Blood Banks, *Technical Manual*, 17th Edition, Bethesda, MD, 2011.

2. American Association of Blood Banks, *Standards for Blood Banks and Transfusion Services*, 28th Edition, Bethesda, MD, 2012.

Written by: **Angela Schoch, MT(ASCP) 10/2005** **Approved by/Title/Date:** Signature on File in Lab		**Dates Reviewed/Revised:** 11/93 7/05 12/97 10/05 11/99 11/08 11/00 04/09 12/01 03/11 2/02 04/15 2/03 11/15 5/03 11/04

Verde Valley Medical Center
Northern Arizona Healthcare

(Patient label)

TRANSFUSION REACTION WORKSHEET

Part 1 (Completed By Nurse)

Completed By:		**CHECK ALL WHICH APPLY:**			
Date:		Pulse ↑		Nausea	
Time:		Pulse ↓		Urticaria-Diffuse	
Physician:		B/P ↑		Wheezing	
Diagnosis:		B/P ↓		Coughing	
Donor #:		Chills		Cyanosis	
Component Type:		Fever ≥ 1 °C or 2 °F		Facial Flushing	
Amount Transfused:		Back/Chest Pain		Hemoglobinuria	
Date/Time Started:		Dyspnea		Itching	
Date/Time Stopped:		Headache		Myalgia	
Previous Units (if any):		Uneasy Feelings		Oliguria/Anuria	
Pre-Transfusion	**Post-Transfusion**	Heat at IV site		Pulmonary Edema	
Temp:	Temp:	Rash		Abnormal Bleeding	
Pulse:	Pulse:	Rales		Anxiety	
B/P:	B/P:	Shock		Other:	
R/R:	R/R:				

Part 2 BASIC LABORATORY INVESTIGATION **Tech:** **Date/Time:**

Recheck of patient/donor unit ID numbers, blood types and transfusion records:					**Discrepancy (Yes/No):**			
Group/Rh	**A**	**B**	**AB**	**D**	**DC**	**A1**	**B**	**Interp**
Patient Pre-Transfusion								
Patient Post-Transfusion								
Blood Unit Type Confirmation								
Visual Inspection of pre-transfusion pt. specimen	Hemolysis (Yes/No):							
Visual Inspection of post-transfusion pt. specimen	Hemolysis (Yes/No):							
DAT on pre-transfusion patient specimen	Pos/Neg:							
DAT on post-transfusion patient specimen	Pos/Neg:							
Post-transfusion urine: Color:								
Occult Blood (dipstick blood results):								
Microscopic RBCs:								
Send to Microbiology ☐								
Blood Unit Gram Stain Results:								
Send to Pathology for Preliminary Review: ☐								
Blood Unit Culture Results:								
Patient Blood Culture Results:								
IF PART 2 RESULTS ARE NEGATIVE (Excluding Pending Cultures), PART 3 IS NOT NECESSARY								

Part 3 EXTENDED LABORATORY INVESTIGATION

Crossmatch				**Gel**	**Antibody**	**Screen**	
	IS	**AHG**	**Interp**	**I**	**II**	**III**	**Interp**
Pre-transfusion							
Post-transfusion							
Total Bilirubin	**5Hr:**		**24 Hr:**	***Creatinine***	**5Hr:**	**24Hr:**	

Part 4 PATHOLOGIST'S INTERPRETATION

REACTION CATEGORY		***PRELIMINARY***
Febrile		
Allergic		
Septic		***FINAL***
Hemolytic		
Other		