TRANSFUSION REACTION – IMMEDIATE RECIPIENT COMPLICATIONS

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PURPOSE

To describe the steps for managing a transfusion complications which occurs during or immediately following the transfusion of a blood component.

BACKGROUND

The CDC's National Healthcare Safety Network includes a biovigilance component directed toward transfusions which is known as the Hemovigilance Module. It was created to implement national surveillance of transfusion-associated adverse events aimed at improving patient safety, minimizing morbidity and mortality of transfusion recipients, and identifying emerging complications and pathogens associated with blood transfusion. As part of this activity, defined categories of transfusion reactions as currently listed are found below. It should be noted that mild allergic reactions (hives, urticarial) are not mentioned. Each type of reaction is carefully defined to contain specific clinical symptoms.

- TACO Transfusion-associated circulatory overload
- TRALI Transfusion-related acute lung injury
- TAD Transfusion-associated dyspnea
- Allergic Transfusion reaction (where severity = severe, life threatening, or death)
- Hypotensive Transfusion reaction
- FNHTR Febrile non-hemolytic transfusion reaction
- AHTR Acute hemolytic transfusion reaction
- DHTR Delayed hemolytic transfusion reaction
- DSTR Delayed serologic transfusion reaction
- TAGVHD Transfusion-associated graft vs. host disease
- PTP Post-transfusion purpura
- TTI Transfusion-transmitted infection

For more information, see http://www.cdc.gov/nhsn/PDFs/Biovigilance/BV-HV-protocol-current.pdf

RELATED DOCUMENTS

R-W-TS-0750	Transfusion Reaction – Immediate Recipient Complications
J-W-TS-0755	Transfusion Reaction – Delayed Recipient Complications
J-W-TS0760	FDA Reporting of Biological Deviations
J-F-TS-1033	Culture of Blood Component Form
J-F-TS-1048	Transfusion Reaction Workup Form
(FHS) 586188	Suspected Transfusion Reaction Investigation Form

MATERIALS / SUPPLIES

1. Specimens
   - Pre-transfusion patient EDTA specimen with BBID # sticker attached
   - Post-transfusion patient EDTA specimen with BBID # sticker attached
   - Post-transfusion urine specimen, if necessary to perform extended workup

2. Reagents
   - ABORH typing reagents
   - Anti-AHG, Poly
   - Anti-IgG
   - Anti-C3
   - Check cells
   - Elution Kit

STEPS FOR INITIAL INVESTIGATION

1. If adverse symptoms are experienced by a patient during a transfusion, then according to clinical nursing standards, the transfusionist is instructed to:
   - Stop the transfusion immediately
   - Check vitals
   - Check all patient identifying information and blood unit information for correctness.
   - Notify the ordering physician of signs and symptoms of the reaction.
   - Notify the Transfusion Service.

   Note: Signs and symptoms suggestive of mild allergic reactions (eg, urticaria) do not need to be reported to the transfusion service.

2. Upon receipt of notification, the transfusion service staff will verify with the nurse whether or not the physician has requested a transfusion reaction work-up.

3. If a work-up has been ordered, staff from the remote site or the transfusion service will arrange for a post-transfusion blood sample to be drawn from the recipient as soon as possible (no longer than 45 minutes).

   Note: The specimen must have a Blood Band ID # sticker removed from the patient's armband and placed on the specimen.

4. The transfusionist will complete the "Nursing Report" portion of the Suspected Transfusion Reaction Form.

5. The transfusionist will return the following to either the SJMC Transfusion Service or to the remote-site laboratory:
   - Suspected Transfusion Reaction Form
   - The blood product container (whether it contains any unused blood or not),
   - The attached Transfusion set and intravenous solutions which have had the needle removed.
   - Post-transfusion blood sample if collected by the nurse

6. If the Transfusion reaction occurred at SAH, SCH, or SFH, the tech receiving the forms and blood container from the nursing unit will re-examine the following for clerical errors in patient or unit identification by verifying patient name, MRN, date of birth, blood type, and blood band number in each of the following places.
   - Patient adhesive label on the back of the blood unit
   - Suspected Transfusion Reaction Form
   - Unit Face Label (blood type, product, expiration date, BBID# sticker)

7. The tech will then record the word "Verified" along with tech ID, date, and initials on the Suspected Transfusion Investigation Form next to the words "Clerical Verification".

   For example: "Verified. A25 2/18/09 0445"

8. Investigate any discrepancies if they are present.

9. Remote Sites call SJMC immediately to alert them that samples, etc. will be coming to them.

   Note: At this point, remote sites will send all of the above items listed in steps #3 and #5 to the SJMC Transfusion Service STAT.

10. The Transfusion Service at SJMC will complete the Initial Investigation section of the Transfusion Reaction Workup and any other remaining steps.
    - Perform and document detailed clerical check as shown on form.
    - Record all units transfused within the last 12 hours and note if any were cultured.

11. Centrifuge and examine the pre- and post-transfusion samples for hemolysis and/or icterus. Pink or red discoloration in the post- but not the pre-transfusion sample indicates hemolysis. Record visual results.

    Note: A post-transfusion specimen may also be hemolysed due to imperfect collection technique. Recollection is advised for confirmation of hemolysis.

12. Order and perform an ABORh on the post transfusion sample. Record results on the Transfusion Reaction Workup Form.

    Note: If there is a discrepancy, notify the Medical Director, the Transfusion Service Manager, and the transfusionist immediately.

13. Order and perform a direct antiglobulin test on both the pre- and post-transfusion samples, Identify as "pre- or post-transfusion" result by footnoting. Record results.

14. If the strength of the DAT reaction in the post-transfusion sample is stronger than the reaction in the pre-transfusion sample, perform an elution on the post-transfusion sample to evaluate the cause of the positive DAT. Record results of elution.

15. Interpret the results of the initial investigation as follows:

Presumed Non-hemolytic Reaction	Possible Hemolytic Reaction
1. Hemolysis and/or icterus on post sample negative or is < hemolysis and/or icterus on pre sample 2. ABO on post-sample compatible with unit ABO 3. DAT on post sample negative or reaction strength ≤ strength on pre sample	1. Hemolysis and/or icterus on post sample > hemolysis and/or icterus on pre sample 2. ABO on post sample not compatible with unit ABO type 3. Post-sample DAT reaction strength > pre-sample

16. If the recipient has a temperature increase of ≥ 1°C (or ≥ 1.8°F) complete the Culture of Blood Component Form and take the blood component to microbiology for culture.

    Note: If the recipient experiences rigors, cardiac collapse or shock, perform an immediate gram stain on the unit in addition to culturing it.

17. If the transfusionist reports that the recipient is having breathing difficulties and that Transfusion Related Lung Injury (TRALI) is suspected, notify the Transfusion Service Manager and the Medical Director.

18. If none of the results fall into the possible hemolytic reaction category, notify the transfusionist that the investigation is negative. Document the call on the Transfusion Reaction Workup Form.

19. If any of the investigation results fall into the Possible Hemolytic Reaction category, OR if the recipient's condition suggests a hemolytic episode, i.e. hemoglobinemia or hemoglobinuria as noted by nurse or clinician, it will be necessary to proceed with the extended investigation below.

20. Store the blood bag in the quarantine bucket in the refrigerator until the Medical Director review has been completed. Serious adverse events may require that the blood bag be stored for a longer period of time as the Medical Director designates.

STEPS FOR EXTENDED INVESTIGATION

1. Phone the pathologist on call immediately. Verify that the transfusionist has called the patient's physician; if not, advise them to do so immediately.

2. Ask the transfusionist to send the first voided urine to the laboratory.

3. Complete the extended investigation as outlined below and record results in the Extended Investigation portion of the Transfusion Reaction Workup Form:
   - Repeat ABO Rh and antibody screen on recipient pre-transfusion sample
   - ABO Rh and antibody screen on recipient post-transfusion sample
   - ABO Rh on all units transfused within the last 12 hours of the reaction.
   - Perform an anti-IgG gel method crossmatch on each of the above units with both pre- and post-transfusion samples
   - Perform a bilirubin on the post transfusion sample. If a specimen drawn before the transfusion occurred is available, perform a bilirubin on it as well.
   - Perform a visual examination on the post transfusion urine sample for hemoglobin and intact RBC

   Note: Intact RBCs are not indicative of a hemolytic reaction

4. The pathologist on call may request additional testing, which should be ordered and performed.

5. If any previously unidentified antibodies are detected in the antibody screen during the investigation, work up the antibody to identify it. Antigen type the units which were transfused for the antigen corresponding to any antibody discovered.

6. Report the results of the extended investigation to the pathologist as well as to the nurse caring for the patient. Should the pathologist's interpretation of the results indicate that they are suggestive of hemolysis, bacterial contamination, TRALI, or other serious adverse event related to the transfusion, the interpretation must be reported to the patient's physician immediately.

7. Leave the completed forms and test results for Transfusion Service Manager and Medical Director review and further reporting as appropriate.

8. If discrepancies or errors are identified, proceed with the occurrence management process as soon as possible by writing a QIM or an IRIS.

9. If another patient's sample and/or unit(s) are involved, call the caregiver ASAP and include this patient in the investigation process.

10. If a transfusion fatality or other serious, unexpected adverse event occurs that is suspected to be related to an attribute of a donor or a unit, the collecting facility shall be notified immediately by phone and subsequently in writing.

11. Any fatality due to a transfusion must also be reported as soon as possible to the FDA, ideally within 24 hours. See "FDA Reporting of Biological Deviations".

CERNER ORDERING AND REPORTING

1. Order Transfusion Reaction Investigation in Cerner using test code TRXN, print the label to LP30, and attach to the Transfusion Reaction Workup Form.

2. Leave the completed forms and test results for the Transfusion Service Manager who will perform an initial review and then give them to the Medical Director for final review and signature.

3. After the Medical Director has reviewed and signed the Suspected Transfusion Reaction Investigation Form, the Cerner result will be entered by the Medical Director or the Transfusion Service Manager.
   - Use SRE to result the TRXN.
   - Hit F11, then Help.
   - Choose "See Comment" from the drop down menu.
   - A chartable footnote grid will appear.
   - Free text the conclusion and any comments in the chartable area of the comments field.

4. Send the original copy of the Suspected Transfusion Reaction Investigation form to the patient care unit, or send it to Health Information Management (HIM) for scanning into the electronic medical record.

5. File a copy of the report in the Transfusion Reaction Notebook.

REFERENCE

AABB Technical Manual, current edition

AABB Standards for Blood Banks and Transfusion Services, current edition

DOCUMENT APPROVAL **Purpose of Document / Reason for Change:**			
1. Placed document into current document control format 2. Changed to multi-location document rather than regional as SEH uses a different process 3. Added Related Documents section 4. Listed the types of transfusion reactions as determined by the CDC's National Healthcare Safety Network 5. The specifics of the reaction will be entered into Cerner by the Medical Director or TS Manager 6. Changed "Medical Records" to "Health Information Management" 7. Added the specific temperature rise in Fahrenheit to assist in determining when to culture a unit 8. Added specific typing reagents to the Materials List			
☐ *No significant change to process in above revision. Per CAP, this revision does not require further Medical Director approval.*			
Committee Approval Date	☒ Date: ☐ N/A – revision of department-specific document which is used at only one facility	**Medical Director Approval** *(Electronic Signature)*	Katie Wilkinson, MD 3/19/14