DESCRIPTION/OVERVIEW
This document is meant to improve patient care by providing guidelines for healthcare providers that improve recognition, reporting, and management of acute transfusion reactions.

REFERENCES

AREAS OF RESPONSIBILITY
Blood Bank personnel, Nursing Staff, LIPs.

PROCEDURE
1. Managing acute transfusion reactions:
   1.1. Regardless of the type of acute transfusion reaction, do the following:
       1.1.1. Stop the transfusion immediately
       1.1.2. Assess and stabilize the patient
       1.1.3. Monitor vital signs
       1.1.4. Assess the patient carefully for adequate blood pressure, airway maintenance,
               and respiratory effort
       1.1.5. Keep IV access with normal saline
       1.1.6. Notify patient’s physician and Blood Bank immediately (UH Blood Bank 272-
               2592, if the patient is located at UNMCC, call the UNMCC lab 925-0115)
       1.1.7. Complete Suspected Transfusion Reaction Form (corresponds to steps 2.8-3.7)
               Form found at: https://hospitals.health.unm.edu/intranet/Forms/ClinicalForms/Index.cfm
   1.2. Perform bedside check to confirm that:
       1.2.2 patient name and MRN on patient ID band matches name and number on
            transfusion tag;
       1.2.3 donor information on bag label matches information on transfusion tag to
            include blood product name and unit number, expiration date, blood type and
            any special attributes such as irradiation.
   1.3. Draw EDTA (pink top tube) immediately from site opposite the transfusion. Label with
       patient name, MRN, and date and time of collection, initials of person drawing the
       sample (does not need to be collected or witnessed by lab).
   1.4. Collect urine sample for any transfusion reaction other than allergic-type (e.g. rash only).
   1.5. Send the Blood Bank a copy of the transfusion form along with the Suspected
       Transfusion Reaction Form, the remainder of the donor unit with transfusion set, and the
above specimens ASAP.

2. Document all transfusion reactions in the nursing record including:
   2.1. Time the transfusion started and ended
   2.2. Type of component unit number and expiration date
   2.3. Volume infused
   2.4. Vital signs before, during, and after the infusion
   2.5. Other significant assessment findings (as directed by the Suspected Transfusion Reaction Report Form) including patient statements
   2.6. Nursing interventions and patient’s response to any interventions (i.e. diphenhydramine)
   2.7. Any physician notifications

3. Special considerations:
   With the exception of mild allergic transfusion reactions (i.e. hives and itching), transfusions may not be restarted following a transfusion reaction except as specified below. In extreme circumstances, additional transfusions may be continued or administered without completion of the blood blank transfusion reaction work-up by the laboratory. In such cases, the pathologist on call must be notified (968-1055) of the clinical urgency of the situation in order to authorize the immediate transfusion of additional blood products.

**BLOOD TRANSFUSION REACTION INFORMATION**

1. Although many precautions have been taken to maximize the safety of blood products, transfusion is not without risk. One category of adverse events associated with the transfusion of blood products is acute transfusion reaction, which by definition occurs within 24 hours of transfusion. It is estimated that acute transfusion reactions occur in 2-5% of all transfusions. Fortunately, the most common reactions (mild allergic transfusion reactions and febrile non-hemolytic transfusion reactions) are minor and are generally not harmful to the patient. However, life-threatening reactions may occur, emphasizing the need for immediate recognition, reporting, and management of all transfusion reactions.

2. Acute transfusion reactions may be divided into two broad categories based on whether they are associated with fever (>38.9°C, or 102°F) and/or a rise in baseline temperature of 1°C or 1.8°F. The fever and/or increase in baseline temperature should be attributable to transfusion, and not to the patient’s underlying condition. If, however, the patient’s fever cannot be definitively attributed to the underlying condition, it should be assumed that fever is related to the transfusion. Febrile transfusion reactions include the following types: intravascular immune-mediated hemolytic reactions, extravascular immune-mediated hemolytic reactions, febrile non-hemolytic transfusion reactions, transfusion-related acute lung injury (TRALI), and bacterial contamination of blood products. Transfusion reactions for which fever is not a prominent feature include: mild allergic reaction, anaphylactic/anaphylactoid reaction, and transfusion-associated circulatory overload (TACO). Based on the presence of fever or rise in baseline temperature, one can begin to formulate a “differential diagnosis” for acute transfusion reactions.

3. Suspicion of any transfusion reaction must result in immediate cessation of the transfusion until proper work-up has been completed and continued transfusion has been deemed safe (see Suspected Transfusion Reaction Report Form for further details). For suspected mild allergic reactions the transfusion should be stopped, and an antihistamine administered. If symptoms resolve, transfusion may be resumed prior to completion of the transfusion reaction work-up. Mild allergic reactions are the only acute transfusion reactions for which transfusion may be resumed prior to completion of transfusion reaction work-up.

4. Immediately life threatening transfusion reactions include intravascular immune-mediated
hemolytic reaction, anaphylactic/anaphylactoid reactions, transfusion-associated circulatory overload (TACO), Transfusion-related acute lung injury (TRALI), and bacterial contamination. Recognition, reporting, and management of these acute transfusion reactions is critical to patient care.

5. The appended table of transfusion reactions with associated signs, symptoms, and study findings should aid in their classification (note: all signs and symptoms listed may not be present for a given transfusion reaction, example: fever may be the only symptom of a hemolytic reaction).

DEFINITIONS

- DAT (Direct Antiglobulin Test/Direct Coombs Test): A laboratory test that assesses for immune-mediated hemolysis of red blood cells.
- LDH (Lactate Dehydrogenase): An intracellular enzyme that is used as a marker for cellular/tissue injury (elevated in hemolysis, and other conditions with tissue injury).
- IgA deficiency: A rare disorder in which the immunoglobulin IgA is either decreased or absent in a person (may result in anaphylactic reactions upon blood transfusion).
- BNP (Brain Natriuretic Peptide): A peptide that is increased with excessive stretching of the ventricles of the heart (an indicator of congestive heart failure and/or volume overload).
- Haptoglobin: A protein that binds free hemoglobin, and is decreased in hemolytic anemias.

SUMMARY OF CHANGES

This is a new document.

RESOURCES/TRAINING

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<th>Resource/Dept</th>
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DOCUMENT APPROVAL & TRACKING

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<td>Owner</td>
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<tr>
<td>Consultant(s)</td>
<td>Sara Koenig, MD</td>
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<tr>
<td>Committee(s)</td>
<td>Nursing Practice Council, P&amp;T Committee, Clinical Operations PP&amp;G Committee, Nursing PP&amp;G Subcommittee, UNMH Tissue, Transfusion and Autopsy Committee</td>
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<td>Nursing Officer</td>
<td>Sheena Ferguson, Chief Nursing Officer</td>
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<td>Medical Director/Officer</td>
<td>Sara Koenig, MD, Medical Director, Blood Bank, Laboratory Svcs</td>
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<tr>
<td>Official Approver</td>
<td>Erin Doles, Administrator, Professional &amp; Support Services</td>
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<td>Official Signature</td>
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<td>12/20/2011</td>
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ATTACHMENTS

Appendix A: Blood Transfusion Reaction Table
APPENDIX A: TRANSFUSION REACTION TABLE

<table>
<thead>
<tr>
<th>Type of transfusion reaction</th>
<th>Signs and symptoms</th>
<th>Lab findings/Study findings</th>
<th>Usual causes</th>
<th>Severity</th>
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<tr>
<td>Intravascular immune mediated hemolytic reaction</td>
<td>Generally within minutes of transfusion: fever, chills, hypotension, dyspnea, chest pain, flank pain, oliguria</td>
<td>Hemoglobinemia, hemoglobinuria, positive DAT, decreased haptoglobin, increased indirect bilirubin, increased LDH</td>
<td>ABO incompatibility (often clerical error), due to complement fixing antibody</td>
<td>Life threatening, may be immediate</td>
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<tr>
<td>Extravascular immune mediated hemolytic reaction</td>
<td>Fever, eventually jaundice</td>
<td>Increased LDH and indirect bilirubin, decreased haptoglobin, positive DAT</td>
<td>Non-complement fixing antibody</td>
<td>Clinically significant, not immediately life threatening</td>
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<td>Febrile non-hemolytic transfusion reaction</td>
<td>Fever, chills</td>
<td>No specific findings</td>
<td>Patient antibodies to transfused leukocytes or plasma proteins and/or cytokines in donor product</td>
<td>Generally not significantly harmful to the patient</td>
</tr>
<tr>
<td>Mild allergic reaction</td>
<td>Itching, hives, NO dyspnea or tightening of throat</td>
<td>No specific findings</td>
<td>Patient antibodies to transfused plasma proteins</td>
<td>Generally not significantly harmful to the patient</td>
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<tr>
<td>Anaphylactic/A naphylactoid reaction</td>
<td>Dyspnea, tightening of throat or chest, hypotension</td>
<td>No specific findings</td>
<td>May be due to patients with IgA deficiency</td>
<td>Immediately life threatening</td>
</tr>
<tr>
<td>Transfusion-associated circulatory overload (TACO)</td>
<td>Dyspnea, hypertension, hypoxia, pulmonary edema</td>
<td>Increase in BNP from baseline, diffuse bilateral pulmonary edema on chest x-ray, increased pulmonary capillary wedge pressure</td>
<td>Too rapid and/or excessive blood transfusion, compromised cardiac function</td>
<td>Life threatening</td>
</tr>
<tr>
<td>Transfusion-related acute lung injury (TRALI), (must occur within 6 hours of transfusion)</td>
<td>Dyspnea, fever, hypoxia, pulmonary edema, hypotension</td>
<td>No increase in BNP from baseline, no increase in pulmonary capillary wedge pressure, diffuse bilateral pulmonary edema on chest x-ray</td>
<td>Donor cytokines in blood product, donor antibodies to recipient leukocytes</td>
<td>Life threatening</td>
</tr>
<tr>
<td>Bacterial contamination</td>
<td>Immediate hypotension, fever, rigors</td>
<td>Positive culture from product transfused, or positive patient blood culture</td>
<td>Contaminated platelets most common, can occur with red cells</td>
<td>Immediately life threatening</td>
</tr>
<tr>
<td>Non-immune mediated hemolysis</td>
<td>No specific signs or symptoms</td>
<td>Hemoglobinemia, hemoglobinuria, decreased haptoglobin</td>
<td>Simultaneous infusion of red cells with vancomycin, dextrose, hypotonic solutions, etc.</td>
<td>Generally not significantly harmful to the patient</td>
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