Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Antiglobulin Crossmatch using MTS Anti-IgG Card

November 15, 2007

PRINCIPLE

The crossmatch compatibility test is used to detect the presence of blood group antibodies in intended recipient's serum/plasma directed towards antigens present on donor red blood cells. An antiglobulin crossmatch can be performed using the MTS Anti-IgG CardTM. In the gel test, the donor red blood cells are combined with recipient serum/plasma in the upper reaction chamber of the microtube of an Anti-IgG Card. Following an incubation period to enhance antigen/antibody interaction, the sensitized red blood cells react with the Anti-IgG incorporated in the gel of the microtube during a centrifugation step. Agglutination indicates the presence of an antigen/antibody reaction while lack of agglutination indicates the absence of an antigen/antibody reaction. Agglutinated red blood cells become trapped in the gel at various levels within the microtube, depending on the size of the agglutinates. Free nonagglutinated red blood cells pass through the gel and form a button of red blood cells on the bottom of the microtube.

SPECIMEN

No special preparation of the patient is required prior to specimen collection. Blood should be collected by approved techniques.

Fresh serum or plasma collected with or without anticoagulants may be used in indirect antiglobulin procedures for antibody detection. Testing should be performed as soon as possible. Samples that cannot be tested immediately should be stored at 2-8°C or frozen. In the case of potential recipients of blood transfusion, an FDA requirement states that the specimen should not be stored for longer than 3 days before testing. Antibodies dependent for their detection upon the binding of complement may not be detected if aged serum or plasma from an anticoagulated sample is used for antibody detection tests. Serum should be separated from the red blood cells when stored or shipped.

Hemolyzed and grossly icteric blood samples may cause difficulty in interpretation, and test results should be used with caution. Grossly lipemic samples containing particulates that clog the gel, as indicated by diffuse blotches of red blood cells in the microtube, may be clarified by centrifugation or filtration and retested.

Donor red blood cells may be used within the dating period of the unit.
REAGENTS

• Anti-Human Globulin Anti-IgG (Rabbit) MTS Anti-IgG Card™
• MTS Diluent 2™ (a hypotonic buffered saline solution used for red blood cell preparation only)

Do not use reagents beyond expiration date.

Store gel cards upright at 2°C to 25°C.
Store diluent and red blood cells at 2°C to 8°C.
Bring reagents to room temperature (18°C to 25°C) prior to use.

QUALITY CONTROL

Gel Card

To confirm the specificity and reactivity of the MTS Anti-IgG Card™, it is recommended that each lot be tested on each day of use with known positive and negative antibody samples with the appropriate red blood cells. Reactivity must be present with the positive sample only.

Diluent

MTS Diluent 2™ should be visually checked to ensure that the liquid is not discolored, turbid or showing any signs of bacterial contamination.

PROCEDURE

Donor Unit 0.8% Cell Preparation, using packed red blood cells from donor unit segments or pilot tubes

1. Label a test tube for each donor to be tested.
2. Dispense 1.0 mL of MTS Diluent 2TM into the labeled tube(s). Add 10 μL of the donor packed red blood cells.
3. Mix gently to resuspend. The final red blood cell suspensions should be approximately 0.8%.

Antiglobulin Crossmatch Test Procedure

1. Visually inspect each gel card before use. Each microtube should have a clear liquid layer on top of opaque gel.

CAUTION: Do not use gel cards if the gel matrix is absent or if the liquid level in the microtube is at or below the top of the gel matrix. Do not use gel cards that show signs of
drying, discoloration, bubbles, crystals, or other artifacts. Do not use cards if foil seals appear damaged or opened.

2. Label the MTS Anti-IgG Card™ with the appropriate identification.

3. Remove the foil seal from the gel card or from the individual microtubes used for testing.

Note: Foil should be removed immediately before testing or within one hour of testing. Once opened, the gel may begin to dry out which could affect test results.

4. Add 50 µL of the 0.8% donor red blood cell suspension to the appropriate microtube.

CAUTION: The pipette tip should not touch the gel card. Erroneous results due to carryover may occur.

5. Add 25 µL of recipient serum or plasma to the microtubes.

CAUTION: The pipette tip should not touch the gel card. Erroneous results due to carryover may occur.

6. Incubate the MTS Anti-IgG Care™ for 15 minutes at 37 ± 2°C.

7. After incubation, centrifuge the gel card(s) in the MTS Centrifuge™ at the preset conditions.

8. For manual readings, observe the front and the back of each microtube macroscopically and record reactions as described in the interpretation section of the corresponding MTS Gel Card package insert.

When using automated instruments, follow the procedures that are contained in the operator’s manual provided by the device manufacturer.

Interpretation of Results (Refer to product insert for detailed interpretation information)

• Negative Result (Compatible Crossmatch — No agglutination and no hemolysis of the red blood cells is a negative test result.

• Positive Result (Incompatible Crossmatch) — Agglutination and/or hemolysis of the red blood cells are a positive test result. Red blood cells may remain suspended on the top of the gel or are dispersed throughout the gel in varying degrees. A few red blood cells may form a button in the bottom of the microtube in some positive reactions.

COMMENTS

Interpretation of mixed-field reactions must be done with caution. The presence of fibrin, clots, or particulates may result in some cells layering at the top of the gel. Mixed-field reactions are generally only be observed in tests containing a dual population of red blood cells, such as a
transfused patient, bone marrow recipient or when a pooled cell sample is used for testing. However, not all mixed cell situations have a sufficient minor population to be detected.

Limitations of the Procedure (Refer to product insert for detailed product limitations)

CAUTION: Adherence to the manufacturer's package insert is critical to test performance.

• Proper centrifuge calibration is particularly important to the performance of the MTS Anti-IgG Card. The MTS Centrifugem has been exclusively designed to provide the correct time, speed, and angle.

• Red blood cells must be suspended in MTS Diluent 2™ or be a commercial 0.8% red blood cell in low ionic strength diluent specifically approved for use with the ID-Micro Typing System™.

• Variations in the red blood cell concentration can markedly affect the sensitivity of test results. If red blood cell suspensions are too concentrated, they can give weaker results due to the increase in the antigen/antibody ratio. In addition, red blood cells may fail to completely migrate to the bottom of the microtube and could cause a false positive interpretation. When the red blood cells are too low in concentration, they become difficult to visualize and, in extreme cases, a weak positive can fail to be detected.

• False positive or false negative test results can occur from bacterial or chemical contamination of test materials, inadequate incubation time or temperature, improper centrifugation, improper storage of materials, or omission of test samples.

• Anomalous results may be caused by fresh serum, fibrin, or particulate matter in serum or plasma, or red blood cells that stick to the sides of the microtube. Anomalous results (i.e., a line of red blood cells on the top of the gel) may be observed with serum samples. • and can be minimized by the use of EDTA plasma.

• Red blood cells that test as DAT positive should not be used in an indirect antiglobulin procedure.

• The MTS Anti-IgG CardTM is not manufactured to detect Anti-C3 red blood cell sensitizations. It may be used in the compatibility test; however, some literature reports indicate that the Anti-IgG may occasionally fail to detect antibodies that are demonstrable by the use of antiglobulin reagents containing Anti-C3.

• Optimal reaction conditions vary across antibody specificities. No single test method will detect all antibodies. In some low ionic strength test systems, certain antibodies, such as Anti-E and Anti-K, have been reported to be nonreactive.

• There is the potential for IgM antibodies to react in this test. Some patient antibodies that are IgM in nature may react with corresponding antigens in the upper portion of the microtube and be trapped in the top portion of the gel at the time of centrifugation resulting in a positive reaction.
False positive results may occur if a card that shows signs of drying is used in testing.

The Anti-H of Para-Bom bay individuals may not be detectable in gel.

REFERENCES


Effective Date: 11/2007

Discontinued procedure please refer to Antiglobulin crossmatch using MTS Anti IgG cards.

11/22/2013 VS
Cochise Regional Hospital

Title: Compatibility Testing (Crossmatch)

Principle:

Compatibility testing allows the demonstration of ABO compatibility between the recipients serum and the donor red blood cells. The crossmatch procedure must demonstrate clinically the significant antibodies and must include the antiglobulin test unless the prospective recipient has non-reactive antibody detection tests and has no history of having clinically significant antibodies.

Materials:

1. 12x75 mm glass test tubes
2. normal saline
3. Gamma N-Hance
4. Gamma Anti-IgG
5. Gamma Coombs Control Cells
6. Pasteur pipettes
7. Centrifuge/cell washer
8. lighted magnifying mirror
9. 37 C incubator

Specimen Requirements:

Serum specimens, rather than plasma specimens are preferred for antibody detection and crossmatching. All specimens used must be of acceptable age based on the following rules:

1. If the patient has been transfused or pregnant in the last three (3) months or if an adequate history is not obtained, all antibody screening and crossmatching must be done within 24 hours of collection of specimen.

2. If the patient has NOT been transfused or pregnant in the last three (3) months the specimen can be used for up to five (5) days following collection. Determine the last day a specimen can be used by adding four (4) to the date collected. This specimen can also be used for three (3) days following the initial transfusion within the five (5) day period.

Specimen Storage:
Specimens used in Blood Bank procedures are to be stored in refrigerator for a minimum of seven (7) days at 2-6 C.

Procedure:

A. INITIAL SPIN CROSSMATCH - This procedure is used only to detect an ABO incompatibility between the recipients serum and the donor RBC’s. It is an acceptable procedure ONLY if antibody detection tests art negative and the patient has no history of clinically significant antibodies.

Note: All crossmatches will include forward group and type, reverse group and antibody screen(unless antibody screen has already ben performed on that specimen.

1. Label 1 tube for each donor sample to be tested.
2. Add 2 drops of patients serum to each tube.
3. Add 1 drop of 3-5 % cell suspension made from donor cells to each tube.
4. Centrifuge immediately, read agglutination and record in blood bank log.

B. COMPLETE CROSSMATCH - This procedure meets AABB requirements for all routine situations. The anitglobulin phase, however, rarely uncovers any significant antibodies in a patient whose antibody screening test is negative.

1. Label 1 tube for each donor unit to be sampled.
2. Add 2 drops patients serum to each tube.
3. Add 1 drop 3-5 % cell suspension made from donor cells to appropriate tubes.
4. Add 2 drops Gamma N-Hance to each tube.
5. Incubate 10-30 minutes at 37C.
6. Centrifuge immediately, read agglutination and record in blood bank log.
7. After reading agglutination place in cell washer and wash 4 times.
8. Remove from cell washer making sure all saline has been decanted.
9. Add 2 drops Anti-IgG to the cell button and mix.
10. Centrifuge for 15 seconds.
11. Gently resuspend the cell button and examine for agglutination. Record in blood bank log.
12. All negative or weakly positive Du tests should be confirmed valid by testing with Coombs Control.
C. POSITIVE ANTIBODY SCREEN

If a patient has a positive antibody screen and crossmatch is ordered an antibody panel will be done. If no crossmatch is ordered the physician will be notified of positive antibody screen and decide if antibody identification is to be done.

Blood may be issued in an emergency situation if crossmatch compatible and at the request of the physician.

In non-emergency situations the antibody should be identified before transfusion. If an alloantibody is found, only confirmed antigen negative units should be crossmatched for transfusion. Antibody panels and antigen typing of units are not performed at Southeast Arizona Medical Center and will be sent to the American Red Cross in Tucson for antibody identification and confirmation of antigen negative units.

D. POSITIVE DIRECT COOMBS

If a patient has a positive Direct Coombs an elution should be done on the patient’s cells and a panel run on the eluate to determine any specificity. The blood should be sent to the American Red Cross for this study if it is requested by the physician. (An exception would be a heat elution for investigation of ABO Hemolytic Disease of the Newborn, which may be done at Southeast Arizona Medical Center).

E. NOTIFICATION OF BLOOD AVAILABILITY

On STAT or to be given orders notify the nursing unit as soon as crossmatch is complete and units are ready. Contact the physician if difficulty in antibody screening or crossmatching is encountered and blood will not be available at the desired time.

F. AMERICAN RED CROSS REFERENCE LABORATORY

1. Used for antibody indentification and obtaining confirmed antigen negative units or elution procedures. Include segments from units desiring to be issued for confirmation of crossmatch compatibility and antigen negativity.

2. Call ARC for information on necessary specimens.

3. Complete ARC Request for Consultation form.

4. Arrange transport in conjunction with Administrator/Administrator on call.

Interpretation:

Agglutination and/or hemolysis of the red cells in any step of the crossmatch indicates that the serum being tested contains antibody directed at an antigen or antigens present on the cells. A positive auto control test indicates the presence of an auto-antibody. Further studies will be required to assure that alloantibodies are not also present. The crossmatch is considered compatible if there is no hemolysis agglutination in any step of this procedure.
Procedural Notes and Limitations:

When performing compatibility testing on any patient with an antibody only units negative for the corresponding antigen will be crossmatched. All patients who have been previously identified as having an antibody and that have been crossmatched and transfused, must have a new antibody screen and identification panel done if there is a new request for crossmatch 7 days after the last transfusion. Perform an ABO front grouping (Rh typing on negative units) on donor units to confirm those types. Any unit found to be incompatible with patients serum must be documented as such in the blood bank log book. If testing is delayed the specimen should be stored at 2-8C. All compatibility testing specimens and donor segments should be saved for 7 days following collection.

Result Reporting:

In the computer system the technologist will enter “compat” or “incomp”. Use the comment section to enter the unit number and expiration date.

References:


Effective Date: 1/1989


Revised Date: 1/1999, 12/2006
Direct Antiglobulin Test

Anti-IgG

PRINCIPLE

The direct anti globulin test (DAT) is used to demonstrate the presence or absence of IgG and C3 on the surface of red blood cells. Red blood cells that possess IgG and/or C3 adsorbed to their surfaces are referred to as sensitized red blood cells. The direct antiglobulin test demonstrates the sensitization of red blood cells in vivo. The MTS Anti IgG, Cad Card’ can be used to detect the presence of IgG and/or C3 on red blood cells. In the gel test, the sensitized red blood cells react with the Anti-IgG,-C3d incorporated in the gel of the microtube during a centrifugation step. Agglutination indicates the presence of an antigen-antibody reaction, while lack of agglutination indicates the absence of an antigen-antibody reaction. Agglutinated red blood cells become trapped in the gel at various levels within the microtube, depending on the size of the agglutinates. Free nonagglutinated red blood cells pass through the gel and form a button of red blood cells on the bottom of the microtube.

SPECIMEN

No special preparation of the patient is required prior to specimen collection. Blood should be collected by approved techniques.

Samples intended for direct antiglobulin testing should be drawn into EDTA to prevent in vitro complement binding. If EDTA is unavailable, specimens drawn into ACD, CPD, or CPDA- I are preferable to non-anticoagulated clotted specimens.

Clotted samples should not be refrigerated.

Some samples such as cord blood, blood stored for extended periods of time, or blood that has been incompletely anticoagulated may develop fibrin clots or particulates. The fibrin clots or particulates may interfere with the gel test and cause red blood cell entrapment at the top of the microtube. Testing should be repeated using red blood cells that have been washed to remove the clots or particulates.

Red blood cells that are stored for extended periods of time may also become coated in vitro with complement and/or globulin proteins. Those samples coated with IgG and complement will then test as DAT positive with this reagent.

REAGENTS

• Anti-Human Globulin Anti-IgG (Rabbit) MTS Anti-IgG, CardTM
• MTS Diluent 2TM (a hypotonic buffered saline solution)
Do not use reagents beyond the expiration date.

Store gel cards upright at 2°C to 25°C.

Store diluent and red cells at 2°C to 8°C.

Bring reagents to room temperature (18°C to 25°C) prior to use.

QUALITY CONTROL

Gel Card

To confirm the specificity and reactivity of the MTS Anti-IgG,-C3d CardTM, it is recommended that each lot be tested on each day of use with known positive and negative samples. Reactivity must be present with the positive sample only.

Diluent

MTS Diluent 2TM should be visually checked to ensure that the liquid is not discolored, turbid or showing any signs of bacterial contamination.

PROCEDURE

Preparation of 0.8% Suspension of Test Cells from packed red blood cells

1. Dispense 1.0 mL of MTS Diluent 2 into a labeled test tube.
2. Add 10µL of packed red blood cells to the labeled tube.
3. Mix gently to resuspend. The final red blood cell suspension should be approximately 0.8%.

Direct Antiglobulin Test Procedure

1. Visually inspect each gel card before use. Each microtube should have a clear liquid layer on top of opaque gel.

   CAUTION: Do not use gel cards if the gel matrix is absent or if the liquid level in the microtube is at or below the top of the gel matrix. Do not use gel cards that show signs of drying, discoloration, bubbles, crystals, or other artifacts. Do not use cards if foil seals appear damaged or opened.

2. Label the MTS Anti-IgG Card with the appropriate identification.
3. Remove the foil seal from the gel card or ‘From the individual microtubes used for testing.

   Note: Foil should be removed immediately before testing or within one hour of testing. Once opened, the gel may begin to dry out which could affect test results.
4. Add 50µL of the 0.8% red blood cell suspension to the microtube.

CAUTION: The pipette tip should not touch the gel card. Erroneous results due to carryover may occur.

5. Centrifuge the gel cards in the MIS Centrifuge at the preset conditions.

6. For manual readings, observe the front and the back of each microtube macroscopically and record reactions as described in the interpretation section of the corresponding MTS Gel Card package insert.

When using automated instruments, follow the procedures that are contained in the operator’s manual provided by the device manufacturer.

Interpretation of Results (Refer to product insert for detailed interpretation information)

- Negative Result — No agglutination and no hemolysis of the red blood cells is a negative test result.

- Positive Result — Agglutination and/or hemolysis of the red blood cells is a positive test result. Red blood cells may remain suspended on the top of the gel or are dispersed throughout the gel in varying degrees. A few red blood cells may form a button in the bottom of the microtube in some positive reactions.

COMMENTS

- Direct antiglobulin tests are useful in the investigation of hemolytic disease of the newborn, autoimmune hemolytic anemia, and transfusion reactions.

- Interpretation of the results of a direct anti globulin test depends on the specificity of the anti-human globulin reagent in use.

- The use of various drugs and certain disease states are known to be associated with positive direct antiglobulin tests.

- Interpretation of mixed-field reactions must be done with caution. The presence of fibrin, clots or particulates may result in some red blood cells layering at the top of the gel. Mixed-field reactions should only be observed in tests containing a dual population of red blood cells, such as a transfused patient, bone marrow recipient, or when a pooled red blood cell sample is used for testing. However, not all mixed cell situations have a sufficient minor population to be detected.

Limitations of the Procedure (Refer to product insert for detailed product limitations)

CAUTION: Adherence to the manufacturer’s package insert is critical to test performance.

- Proper centrifuge calibration is particularly important to the performance of the MTS Anti-IgG Card. The MTS Centrifuge has been exclusively designed to provide the correct time,
speed, and angle. Red blood cells must be suspended in MTS Diluent 2 or be a commercial 0.8% red blood cell in low ionic strength diluent specifically approved for use in the ID-Micro Typing System.

- Variations in the red blood cell concentration can markedly affect the sensitivity of test results. If red blood cell suspensions are too concentrated, they can give weaker results due to the increase in the antigen/antibody ratio. In addition, red blood cells may fail to completely migrate to the bottom of the microtube and could cause a false positive interpretation. When the red blood cells are too low in concentration, they become difficult to visualize and, in extreme cases, a weak positive can fail to be detected.

- False positive or Use negative test results can occur from bacterial or chemical contamination of test materials, inadequate incubation time or temperature, improper centrifugation, improper storage of materials, or omission of test samples.

- Anomalous results may be caused by fresh serum, fibrin, or particulate matter in serum or plasma, or red blood cells that stick to the sides of the microtube. Anomalous results (i.e, a line of red blood cells on the top of the gel) may be observed with serum samples and can be minimized by the use of EDTA plasma.

- False positive results may occur if a card that shows signs of drying is used in testing.

- Negative direct antiglobulin test results do not necessarily rule out hemolytic disease of the newborn, especially if ABO incompatibility is suspected.

REFERENCES


Effective Date: 11/2007

Discontinued procedure please refer to Direct Antiglobulin Test IgG. 11/22/2013 VS

Cochise Regional Hospital

Title: Direct Coombs Test

Principle:

The Direct Coombs Test is used to detect antibodies or complement bound to red blood cells. It is useful in diagnosing Hemolytic Disease of the Newborn, diagnosing Autoimmune Hemolytic Anemia, investigating transfusion reactions and diagnosing red cell sensitization caused by drugs.

Materials:

1. 12x75 mm glass test tubes
2. normal saline
3. Gamma AUG
4. Gamma Coombs Control
5. Pasteur Pipettes
6. centrifuge/cell washer
7. lighted magnifying mirror

Procedure:

1. Place 1 drop of 3-5% suspension of patient red cells in a 12x75 test tube. Cells should be from a blood sample collected in EDTA to avoid in vitro uptake of complement.
2. Wash cells 4 times in cell washer. Decant completely.
3. Add 2 drops polyspecific AHG
4. Mix and centrifuge immediately for 15 seconds.
5. Resuspend cell button by gently mixing and examine for agglutination.
6. Record results in blood bank log.
7. If non-reactive leave at room temperature for 5 minutes, recentrifuge and read again.
8. Add 1 drop Coombs Control Cells to all negative tubes. Mix, centrifuge and examine for agglutination.

Interpretation:
Agglutination constitutes a positive result and indicates the presence on the cells of IgG or complement or both. No agglutination constitutes a negative test result.

Quality Control:

All reagents are checked daily using the Gamma RQC system.

Procedural Notes and Limitations:

It is important to centrifuge the test without delay after adding the AHG to the washed cell button. Progressively diminishing agglutination may accompany delayed centrifugation. The sensitivity of the Direct Coombs Test is greatly impaired if human protein even in very small amounts is introduced into the test system after washing the cells. A negative Direct Coombs test may not necessarily exclude Hemolytic Disease of the Newborn, especially if ABO incompatibility is suspected as the cause.

Result Reporting:

In the computer system the technologist will enter positive or negative on the test line.

References:

2. Gamma AHG insert, May 2000
Cochise Regional Hospital

Title: Prewarmed Technique for Antibody Screening and Compatibility Testing

Principle:

Warm cell suspensions and serum before mixing to prevent the attachment of cold antibodies to red cells and the production of incompatible reactions in the antiglobulin phase caused by complement binding to the cells. Albumin should not be used in this technique because of its tendency to enhance the activity of cold antibodies.

Materials:

1. 12x75 glass test tubes
2. normal saline
3. Gamma IgG
4. Gamma Coombs Control Cells
5. pasteur pipettes
6. centrifuge
7. 37°C incubator
8. lighted magnifying mirror

Procedure:

1. Warm a 3-5% suspension of washed cells in saline in a properly labeled tube at 37°C for 10 minutes. (Including screening cells, donor cells and patient cells).
2. Warm 2 drops of patients serum separately in a labeled tube for 10 minutes.
3. Add 1 drop pre-warmed cell suspension to the pre-warmed serum without removing the tubes from the incubator holding the pipette as close to the serum as possible without touching.
4. Mix.
5. Incubate at 37°C for 30 minutes. Warm a bottle of saline to this temperature.
6. After incubation wash the cells 4 times with the warm saline.
7. Add 2 drops IgG specific antiglobulin serum (room temperature).
8. Mix.
9. Centrifuge and examine macroscopically for agglutination.
10. Add 1 drop of Coombs Control Cells to all negative tests.

11. Centrifuge and examine for agglutination. If negative, repeat test.

References:

Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Transfusion Reaction

Policy

During administration of blood products assessments are made to monitor the possibility of adverse reactions.

Principle

Transfusion of blood and blood components is ordinarily a safe and effective way to correct hematologic deficits but unfavorable results may occur. These adverse effects are commonly called “transfusion reactions” and may manifest at any time during or after the transfusion process. Reactions may be classified as acute hemolytic, febrile, urticara (hives), transfusion induced sepsis, anaphylactic, circulatory overload or transfusion related acute lung injury.

Clinical Indications:

The most common initial symptom of a transfusion reaction is fever, frequently accompanied by chills. The onset of symptoms may be misleadingly mild and the first observable sign may be hemoglobinuria with or without back pain. Other signs and symptoms may include chest pain, hypotension, nausea, flushing, dyspnea, shock, generalized bleeding, oliguria and anuria and pain or burning at the infusion site and along the course of the vein. Clinical indications of a hemolytic transfusion reaction may occur when as little as 10-15 ml of incompatible blood has been transfused.

Procedure:

Monitor closely for the following signs and symptoms.

1. Fever, defines as temperature increase of 1 degreeC or 2 agrees F with or without chills.
2. Shaking chills (rigors) with or without a fever,
3. Pain-at the infusion site, in chest, abdomen or flanks.
4. Blood pressure changes, usually acute, either hypertension or hypotension.
5. Respiratory distress, including dyspnea, tachypnea or hypoxemia.
6. Skin changes, including flushing, urticara and localized edema.
7. Nausea, with or without vomiting.
8. Acute onset of sepsis, including fever, severe chills, hypotension, high-output cardiac failure.

10. See appendix possible signs and symptoms of a transfusion reaction.

Nursing Protocol:

When any adverse symptoms or physical signs occur during the transfusion of blood or its components the following actions must be taken immediately:

1. Stop the transfusion.

2. Keep vein open with normal saline.

3. Notify physician immediately.

4. Notify laboratory immediately regardless of physician’s orders.

5. Check all forms, labels and patient ID to determine if transfusion is on the correct recipient.

6. Take vital signs frequently (every 10-15 minutes) and perform emergency treatment as needed.

7. Administer medication and/or treatment as needed.

8. Complete the “Investigation of a Hemotherapy Incident” form and take to the Laboratory.

9. See-the-attachment labeled “Possible Signs and Symptoms of a Transfusion Reaction”.

10. If a transfusion is discontinued send blood tag and administration set without needles and it associated forms to the Laboratory.

11. Laboratory will draw necessary blood.

12. RN will collect urine immediately and 5 hours post reaction and send to the Laboratory.

Laboratory Protocol:

1. Draw patient immediately upon report of reaction. Draw a 15 ml red top tube and a 7 ml lavender tube from the patient taking care to avoid hemolysis.

2. Perform clerical check and unit checks. Check all labels, forms and patient identification errors. If there is a discrepancy immediately notify the patients physician and search for appropriate records to find if errors were made on other patients. Check unit for signs of bacterial contamination.

3. Compare the patients pre-reaction and post-reaction specimens for:

   a. Color of serum or plasma – Any visible hemolysis present in the post-reaction specimen but not in the pre-reaction usually indicates the presence of free hemoglobin and destruction of
red cells. Intravascular hemolysis of as little as 5 ml of red cells can produce visible hemoglobinemia. In samples drawn 4-10 hours after transfusion, yellow or brown discoloration may indicate recent hemolysis.

b. Direct Antiglobulin Test (DAT) – If antibody or complement coated transfused incompatible cells are not immediately destroyed the DAT on the post reactions specimen will be mixed field positive. The DAT may be negative if the specimen is drawn several hours after the suspected reaction due to rapid destruction of incompatible cells. Also, hemoglobinemia may be seen with a negative DAT in cases of non-immune hemolysis (i.e from thermal damage, infusion with non-isotonic solutions, etc.).

4. If hemoglobinemia observations and DAT are negative:

DISCONTINUE THE INVESTIGATION. Negative observations for hemoglobinemia and a negative DAT usually indicate there has not been an acute hemolytic reaction and the investigation may stop here. The Pathologist must review and interpret these results and sign the investigation. File one copy in the blood bank. Send a copy to the physician and the original should go in the patients chart.

5. If hemoglobinemia observations and/or DAT are positive or doubtful: Or if Pathologist feels the patients condition warrants further investigation:

a. immediately notify the patients physician if hemoglobinemia observations and/or DAT is positive or if unit appears to have bacterial contamination.

b. Repeat the ALO/Rh testing, perform the ADO and Rh tests on the pre and post-reaction samples and the blood from the unit segment. A mixed field pattern in the post-reaction specimen suggests the presence of incompatible donor cells. If a discrepancy is found between pie and post transfusion specimens, check record of any other specimens drawn around that time and recheck all blood bank work on other patients done at that time.

c. Repeat the antibody screen testing. Perform the antibody screens on the pre and post reaction specimen and on the donor unit. If any are positive send to ARC for antibody identification. Send donor segments, pre and post reactions samples so ARC can look for the presence of the corresponding antigen.

If pre-reaction specimen is positive when previously negative: Check records to find where the discrepancy occurred.

If post-reaction specimen is positive and pre-reaction specimen is negative: Check patient records for recent transfusions possibly causing an amnestic response, If donor specimen is positive: Do a minor crossmatch against patients pre-reaction specimen.

d. Repeat the Crossmatch. Use the pre and post-reaction serum against donor cells from the segment or bag.
If incompatible with both pre and post-reaction specimens an error was made during pre-reaction testing. Repeat crossmatches with the original segment used if possible.

If incompatible with post but compatible with pre-reaction specimen suspect an anamnestic antibody response. Research past transfusion history and repeat antibody screens. Repeat forward ABO and Rh type of negative units.

If the above testing is negative or the Pathologist feels the investigation can be stopped complete the Investigation of Hemotherapy form and send to the Pathologist for review and signature. File a copy in the blood bank, send a copy to the physician and the original goes to the patient chart.

6. After review of the above information the Pathologist may feel additional tests are necessary to follow the clinical course of the reaction. Consult the Pathologist for direction regarding the following:

a. examination of post-reaction urines for hemoglobin and its metabolites,

b. serum bilirubin,

c. gram stain and culture of units.

d. coagulation studies

e. urine output studies,

f. blood haptoglobin level,

7. Any fatalities resulting from transfusion complications must be reported by the Pathologist to the FDA, Office of Biologics Research and Review and the CLIA in writing within 7 days following the fatality.

8. Any potential or adverse reaction caused by faulty components (such as mislabeling, etc.) should be reported to the American Red Cross by the day following the reaction.

9 If any of the initial checks are positive the Laboratory Manager and Medical Director should be notified immediately.

a. If the patients physician suspects a hemolytic transfusion reaction the Laboratory Medical Director will be notified. The Laboratory Medical Director will take charge of the investigation in cooperation with the patients physician and they will intensively investigate and report findings to the medical staff.

10. The report of suspect transfusion reaction is reviewed by the Laboratory Manager and is sent to the Laboratory Medical Director for review, interpretation and signature. This signed report is to be placed in the patient record. A copy of the report is maintained in the Laboratory transfusion files,
NOTE: With some urticaria and febrile reactions, the transfusion may be temporarily interrupted while medication is administered. If symptoms are mild and promptly relieved the transfusions may be resumed by physician order if transfusion can be completed within a four hour limit.

Section 606.170(a) of Title 21, Code of Federal Regulations, requires transfusion facilities to forward written reports of adverse reactions to the collecting facility when it was determined that the blood component was at fault in causing the reaction.

Following Cochise Regional Hospital transfusion work-up, if it is determined that the blood product was the cause for the reaction, the technologist and/or the Pathologist will fill out the Bacon Study Report from the ARC and return it to them immediately. (12/07/01 pja).

References:


Effective Date: 2/1995


Possible Signs and Symptoms of a Transfusion Reaction

<table>
<thead>
<tr>
<th>GENERAL</th>
<th>CARDIOVASCULAR SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>-fever (rise of 1 degree C/2 degree F)</td>
<td>-heart rate</td>
</tr>
<tr>
<td>-chills</td>
<td>-heart rate</td>
</tr>
<tr>
<td>-chills</td>
<td>-bradycardia</td>
</tr>
<tr>
<td>-muscle aches, pain</td>
<td>-tachycardia</td>
</tr>
<tr>
<td>-back pain</td>
<td>-tachycardia</td>
</tr>
<tr>
<td>-chest pain</td>
<td>-hypotension, shock</td>
</tr>
<tr>
<td>-headache</td>
<td>-hypertension</td>
</tr>
<tr>
<td>-heat at site of infusion or along vein</td>
<td>-peripheral circulation</td>
</tr>
<tr>
<td>color:</td>
<td></td>
</tr>
<tr>
<td>-cyanosis, facial</td>
<td></td>
</tr>
<tr>
<td>NERVOUS SYSTEM</td>
<td>flushing</td>
</tr>
<tr>
<td>-apprehension, impending sense of doom</td>
<td>temperature:</td>
</tr>
<tr>
<td>-tingling, numbness</td>
<td>-cool/clammy</td>
</tr>
<tr>
<td></td>
<td>-hot/flushed/dry</td>
</tr>
<tr>
<td></td>
<td>-edema</td>
</tr>
<tr>
<td>RESPIRATORY SYSTEM</td>
<td>-bleeding</td>
</tr>
<tr>
<td>-bleeding</td>
<td>generalized (D.I.C,) oozing of surgical site</td>
</tr>
<tr>
<td>-respiratory rate</td>
<td></td>
</tr>
<tr>
<td>tachypnea</td>
<td></td>
</tr>
<tr>
<td>apnea</td>
<td></td>
</tr>
<tr>
<td>-dyspnea</td>
<td>RENAL SYSTEM</td>
</tr>
<tr>
<td>-cough</td>
<td></td>
</tr>
<tr>
<td>-changes in urine volume</td>
<td></td>
</tr>
<tr>
<td>-wheezing</td>
<td>-oliguria, anuria</td>
</tr>
<tr>
<td>-tales</td>
<td>renal failure</td>
</tr>
<tr>
<td>-changes in urine color</td>
<td></td>
</tr>
</tbody>
</table>
GASTROINTESTINAL SYSTEM  dark, concentrated shades of red, brown, amber may indicate the presence in urine of RBC’s (hematuria) or of free hemoglobin(hemoglobinuria)

-nausea

-vomiting

-pain, abdominal cramping

-diarrhea (may be bloody)

INTEGUMENTARY SYSTEM

-rashes, hives (urticaria)

-itching

-diaphoresis

Cochise Regional Hospital

INVESTIGATION OF A REPORTED HEMOTHERAPY INCIDENT

Patient Name: Physician:
Birth Date: Patient (MRN):
Room No. Diagnosis:

NURSING ACTIONS

1. Stop Transfusion: Notify Dr. Date/Time:
2. Perform Clerical Check:
   Blood Inspected and Issued By: Date/Time:
   Blood Product No.: Donor ABO: Donor Rh:
   Number Correlates with Lab Records? yes no
   Patient ABO: Patient Rh:
   Patient Identification and Blood Product number verified by:
   Date/Time
3. Notify Laboratory: Tech Date/Time:
4. Send Entire Transfusion Unit to Lab.
5. Collect an Immediate –5 hr. Reaction Urine Specimen to the Lab.
6. Infusion Solution Used:
7. Medications Infused with Component:

Vital Sign Recording

<table>
<thead>
<tr>
<th>Time</th>
<th>rate</th>
<th>B/P</th>
<th>r/P/R</th>
<th>lung sound (S. O. B.) RN</th>
</tr>
</thead>
</table>
prior to Infusion
15 min. after infusion started
30 min. after infusion started
after infusion
Blood Warmer Used? Yes  No

Transfusion Started at:  time  by: _______, RN

Transfusion Complete/Discontinued at:  (time)  by: _______, RN

Volume Transfused:

Difficulty with Administration? No  Yes (specify:)

Adverse Reaction During/Following Transfusion

hives, itching:  (area of body affects)
fever (temp. rise > 1.5° F. over pre-transfusion level)
pain (arm, infusion site, back, flank, head, chest) [circle as applicable]
dyspnea (respiratory rate:

nausea vomiting

hematuria (collect urine specimen, if possible)

NURSE COMPLETING FORM    Date/time:

Please Send This Form to the Laboratory —STAT
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Transfusion Reaction Work-Up

Policy:

Is the policy of Cochise Regional Hospital to begin transfusion reaction work-up immediately upon notification from nursing staff that a suspect transfusion reaction has occurred.

Procedure:

Obtain post transfusion specimens from the patient consisting of two (2) 10 ml plain red top tubes and a 5 ml lavender top tube, Label tubes with patients full name and MR number obtained from the arm band as well as date, time and initials.

Collect all material necessary for complete investigation. This will include pre and post-transfusion specimens, suspect unit and attached forms, "Investigation of Reported Routine Transfusion Reaction" form with top portion completed by nurse and post-transfusion urine specimen.

Immediately perform steps 1-3 below. Notify Laboratory Director.

Investigation of a Reported Transfusion Reaction consists of the following:

1. Recheck all clerical information, (ie patient name, MR number, unit number of crossmatched unit, unit number of transfused unit, etc.) to ensure all appropriate information matches and are correct.

2. Inspect post-transfusion plasma for hemolysis. Compare to pre-transfusion specimen.

3. Perform Direct Coombs test on post-transfusion specimen. If positive perform Direct Coombs test on pre-transfusion specimen.

Note: If any step above is positive notify the Laboratory Medical Director and proceed with steps 4-9 as directed. An extended investigation will be initiated. If the steps above are negative the routine investigation is complete.

1. Repeat ABO and Rh typing on pre-transfusion specimen, post-transfusion specimen and on donor unit.

2. Repeat crossmatch with both pre and post-transfusion specimens.

3. Repeat antibody screen on both pre and pots-transfusion specimens.
4. If ordered by the Laboratory Medical Director perform culture and gram stain on donor unit. Do gram stain STAT if donor plasma is hemolyzed.

3 specimens should be cultured: Segment from the unit, saline/IV solution from the bag in question and the patient’s blood. Units and saline bags should be separate orders. The blood bag segment should be labeled with donor/unit number.

5. Check post-transfusion urine for free hemoglobin by performing urine dipstick for blood.

6. Perform total bilirubin on patient’s pre-transfusion specimen and a 4-6 hour post-transfusion specimen.

Extended Investigation-Reported Transfusion Reaction consists of the following:

   If an antibody was detected perform an antibody panel.

   If a positive Direct Coombs test was detected patient’s blood will be sent to American Red Cross for eluate and specificity. Send “Request for Consultation” form with specimen.

   Plasma hemoglobin and haptoglobin on pre and post-transfusion specimens are to be sent to reference lab.

The forms “Investigation of Reported Routine Transfusion Reaction” and “Extended Investigation-Reported Transfusion Reaction” forms will be used for working on suspect transfusion reactions. All reports of suspect transfusion reactions will be reviewed by Laboratory Manager, then sent to Medical Director for review, interpretation and signature.

The original signed report is to be included in the patient’s record. A copy will be maintained in the Laboratory transfusion files.

Delayed Transfusion Reactions

Primary alloimmunization can become apparent weeks or months after transfusion. Once this occurs blood group antibodies can disappear especially antibodies of the Kidd system. If red cells containing the corresponding antigen to the antibody are transfused the appearance of IgG antibodies can be detected within hours or days of transfusion. These antibodies will react with the transfused cells. This is called an anamnesis response. If the laboratory finds this response upon testing the tech will contact the Laboratory Medical Director and the patient’s physician.

The possibility of a delayed hemolytic transfusion reaction should be investigated. In most cases this does not cause a hemolytic reaction but hemolysis can result in some patients.

Most common signs of presentation:

Declining hemoglobin

Newly positive antibody screen

Possible fever, leukocytosis and mild jaundice may be present
Possible absence of increased hemoglobin after transfusion

Infrequently hemoglobinuria

Renal failure is uncommon

Procedure:

• Contact Laboratory Manager, Laboratory Medica Director and patient’s physician.
• Obtain fresh blood sample for repeat testing antibody screen, DAT and compatibility testing.
• Units should be antigen typed as well as patient specimen.

Treatment and Prevention:

• Monitor patients urinary output and renal function.
• Observe changes in patients coagulation function.
• All subsequent transfusion must be with antigen negative units.

All patients with positive antibody screens, incompatible compatibility testing and confirmed antibody studies must be documented on the patient blood bank card located in the Blood Bank. All cards are kept indefinitely.

Reference:

Sierra Vista Regional Helath Center Transfusion Reaction Culture Policy #MIC422. Effective 2008


Cochise Regional Hospital

Title: Work-up for ABO Hemolytic Disease of the Newborn (HDN)

Initial Studies:

Baby: Perform ABO group, Rh and Direct Coombs on cord blood.

Mother: Perform ABO group, Rh and antibody screening to rule out the presence of atypical antibodies. If antibody screening is positive, the cause must be identified and if due to an antibody capable of causing IIDN, it must be investigated as a possible cause of the baby's hemolytic disease.

Presumptive Evidence to Support ABO Incompatibility:

Baby: Group A or B, Direct Coombs may be positive or negative

Mother: Group 0 (or Group A with Group B baby or vice versa), antibody screen negative or not due to an antibody capable of causing HDN.

Confirmatory Evidence to Support ABO incompatibility:

Baby’s serum positive for free-anti-A in GroupA baby or free-anti-B in Group B baby Baby’s eluate positive for anti-A if baby is A or anti-B if baby is B.

Mother’s serum positive for hemolytic anti-A or B.

Procedure:

Cord Blood:

a. Into a properly labeled tube add 1 drop of washed reagent Al cells (if baby is Group A) or B cells (if baby is Group B).

b. In another tube add 1 drop washed 0 antibody screening cells for the control.

c. Add 2 drops of cord blood serum in each tube and 2 drops of bovine albumin.

d. Mix and incubate 30 minutes at 37C.

e. After incubation wash the cells 4 times.

f. Add 2 drops of anti-human globulin serum.

g. Mix and centrifuge for 15 seconds.

Interpretation:
Agglutination with A or B cells but not with O cells is a positive test for free-anti-A or free-anti-B.

Cord Eluate:
1. Prepare eluate according to directions of heat elution (See AABB manual).
2. Place 2 drops of eluate and 2 drops bovine albumin in each of 2 test tubes.
3. In one tube add 1 drop of washed Reagent A or B cells.
4. In the other tube add 1 drop of washed Group 0 screening cells for the control.
5. Mix and incubate 30 minutes at 37 C.
6. After incubation wash 4 times.
7. Add 2 drops anti-human globulin serum to each tube.
8. Mix and centrifuge 15 seconds,

Interpretation:
Agglutination with the A or B cells but not with 0 cells is a positive test for absorbed anti-A or anti-B.

Hemolysin Test — Mother’s Serum:
1. Place 2 drops of fresh mothers serum in each of two test tubes.
2. To one tube add 1 drop washed Reagent A cells if the baby is A or B cells if the baby is B.
3. To the other tube add 1 drop of washed Group 0 screening cells for the control.
4. Mix and incubate for 15 minutes at 37 C.
5. Observe for hemolysis.

Interpretation:
Partial or complete hemolysis of A or B cells but no hemolysis of 0 cells is a positive test for hemolytic anti-A or B.

References:
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Issuing Blood and Blood Components

Policy:

Is the policy of Cochise Regional Hospital to follow all standards pertaining to Blood Bank and blood products from the CLIA and the American Association of Blood Bank (AABB).

The following procedures will be followed whenever blood or components are issued from the Blood Bank:

1. The RN taking the unit will bring a paper with a label which contains the patient’s name and medical record number for identification.

2. This paper will be matched against the Compatibility Label attached to the unit to ensure name and MR number match correctly.

3. The unit number of the blood will be matched against the unit number listed on the Transfusion Record form and Compatibility Label.

4. The unit will be inspected visually for hemolysis or abnormal appearance.

5. The Blood Bank Record Log will be used in issuing the unit. Complete date, time, patient name, MR number, type and Rh and inspection of the unit opposite the unit number in the log book. The RN taking the unit is to sign as person taking the blood. A witness must sign signifying they have witnessed the entire issuing process. Normally the witness is a Lab Tech. If the Laboratory is closed blood can only be issued to the Nursing Supervisor. In this case an RN must act as witness.

6. Complete the Compatibility Label and Transfusion Record form attached to the unit by filling the date and time of issue and both the person taking the blood and the witness initialing in the “Sign Out from Blood Bank” area. Keep pink copy of Transfusion Record form in the lab.

7. The Transfusion Record form should be completed and white copy should be filed in the patients chart. The compatibility label and yellow copy of Transfusion Record form should be returned to the Laboratory and filed with the patient’s Blood Bank records.

8. RN may take the unit to the floor for transfusion.

9. Anti-hemophiliac factor does not require sign-out in the Blood Bank record log. Complete appropriate information on Transfusion Requisition form, Include lot number of AHF.
10. Laboratory technologist will enter all information into computer system under each unit to include date and time issued as well as name and title of person accepting unit. Disposition of units must be changed to issued and unit must be billed at this time.

Effective Date: 1/1989


COMPATIBILITY LABEL

Pt Name:

Med Record #  Rm #:

Pt. Group:  Rh:

Donor #:

Donor Group: Rh:

Crossmatch Compatible:

Date:  Tech:

Dr.:
Transfusion Record Form to be displayed here as part of Issuing blood and blood components policy
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Transfusion of Blood and Blood Components

Policy:

It is the policy of Cochise Regional Hospital to provide a safe and effective way to correct hematologic deficits through transfusion, in addition to complying with regulatory standards.

Procedure:

Prior to signing out a unit of blood the following should be ready:

1. Consent for Transfusion form signed by patient.
2. Vital signs taken and documentation of Transfusion Record form.
3. All equipment set up and normal saline running.

All units of blood should be checked by two (2) licensed personnel for:

1. Patient identification — check name and hospital number on unit against armband on patient.
2. Type and Rh - check unit against Transfusion Requisition.
3. Both licensed personnel have to initial Transfusion Requisition to document checking patient identification.

Blood is to be mixed gently before transfusing. A few milliliters of normal saline may be run through the V tubing into the packed cells to allow the packed cells to flow more freely. One (1) unit of packed cells may be infused in one and a half (1-1/2) to two (2) hours and the transfusion should be completed within four (4) hours because of the risk of bacterial growth. A new blood administration set is to be used with each two (2) units of blood. Take vital signs periodically during transfusion and observe patient for evidence of reaction.

Only normal saline is allowed to run with blood. NEVER add medication to blood. NO EXCEPTIONS!

The Transfusion Requisition is used to record the following information:

1. Date and time transfusion started.
2. Date and time transfusion completed.
3. Patient’s temperature before and after transfusion.
4. Any adverse reaction.

When transfusion is completed the Transfusion Record form is to be put on the chart. Compatibility Label is to remain on the empty blood bag. Return the empty blood bag and copy of Transfusion Record form to the Laboratory.

SPECIAL NOTES:

Platelet transfusions are to be administered as rapidly as possible, about ten (10) minutes per bag. The container and filter may be flushed with 0.9% saline to increase the number of platelets given. It is not necessary to change the blood administration set while transfusing.

Fresh Frozen Plasma should be administered at a rate of about 10 ml per minute.

Upon receipt of the empty blood unit the Laboratory will record the date of return on the empty blood bag. The empty blood unit is stored for seven (7) days in the refrigerator before disposal. The form attached to the unit will be filed with the Blood Bank records.

Effective Date: 1/1999


Title: Release of Crossmatched Blood

Policy:

It is the policy of Cochise Regional Hospital to communicate with nursing when crossmatched blood expires. In the event that crossmatched blood is no longer needed it shall be the responsibility of nursing personnel to notify the Laboratory so the blood may be released.

Procedure:

Generally all blood is released 48 hours after crossmatch.

In an emergency, blood may be released at any time by the Laboratory. The nursing unit will be notified that the blood is no longer available. The released units will be replaced if necessary as soon as more blood is available.

Blood crossmatched on a patient that has been transfused or pregnant in the last three (3) months will be released in 24 hours. When a blood user is to have a specific number of units on hold at all times, these units must be re-crossmatched every day using a fresh blood specimen. This cannot be done until orders have been received by the Laboratory and the patient is redrawn.

Effective Date: 1/1989


Revised Date: 1/1999, 10/2008, 11/2013, 06/2014
Title: Blood and Blood Product Administration

PURPOSE

Administration of blood increases the client’s hemoglobin and hematocrit for improved circulation and oxygen distribution. Other blood products are given to replace specific blood deficiencies.

POLICY:

It is the policy Cochise Regional Hospital (CRH) to utilize American Red Cross Blood products.

It is the policy of CRH Laboratory to adhere to the following:

- Blood products are only released to a Registered Nurse (RN) or physician.
- The RN shall not sign out blood products for more than one (1) patient at a time.
- The RN shall not sign out more than one (1) blood product per patient at a time. (Exception will be made for surgery or emergency patients when two (2) units are to be transfused simultaneously). Prior to administration of blood products to a patient verification of the unit(s) must be verified and documented by two (2) licensed registered nurses/physician.
Cochise Regional Hospital

Title: Leukocyte Reduction Filter

Principle:

Leukocyte reduction of transfused blood is indicated for prevention of recurrent febrile non-hemolytic transfusion reactions. A 20 micron filter is used to remove the white blood cells from a transfusing unit of packed red blood cells.

Policy:

Leukocyte reduction filters should be used when transfusing patients with a history of febrile, non-hemolytic reactions.

A physician order is needed to use a leukocyte reduction filter.

One (1) 20 micron filter may be used to transfuse two (2) units of packed red blood cells.

These special filters are issued by the Laboratory.

Effective Date: 1/1999

Reviewed Date: 12/2006
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Emergency or Uncrossmatched Blood and/or Blood Products Release

Policy:

It is the policy of Cochise Regional Hospital to issue blood and/or blood products in a dire emergency when a physician may feel the urgency of the situation warrants the issue of blood before a crossmatch can be completed. The physician accepts the additional risk involved and released the Laboratory and its staff from any liability resulting from the transfusion of uncrossmatched blood.

Procedure:

Before uncrossmatched blood is issued the “Emergency Request for Uncrossmatched Blood” form is to be signed by the ordering physician or by a person authorized by him/her and delivered to the blood bank by the person picking up the blood. If the form is not signed by the physician he/she must countersign as soon as the emergency is over. The original of the signed form is to be included in the patient record. A copy is kept in the Laboratory transfusion files.

1. Type specific blood will be given if time permits testing the patient.

2. If patient’s blood type is not determined 0 negative packed cells will be issued.

A maximum of two (2) units of 0 negative cells may be given. Follow with type-specific blood, if type-specific blood is not available give ABO compatible packed cells. Recipient type should be determined on a pre-transfusion specimen.

An unsensitized Rh negative patient my be given Rh positive blood or incompatible blood products in a life threatening EXTREME EMERGENCY with the knowledge and consent of the Laboratory Medical Director or the Chief of Staff. In addition, the Laboratory Medical Director should and MUST be notified for any emergency release crossmatch requests on any patient with a positive antibody screen and/or incompatible blood units. The Laboratory Medical Director can be reached at (520) 459-1984.

If a pre-transfusion specimen was obtained the crossmatch will continue to completion. If incompatibility is detected at any stage of testing the patient’s physician will be notified immediately.

A transfusion form is to be attached to the unit with “Emergency Release” written on the comment line.

Effective Date: 1/1989
EMERGENCY RELEASE OF BLOOD AND BLOOD COMPONENTS FOR TRANSFUSION AND/OR TRANSPORT

Cochise Regional Hospital

RECEIVING FACILITY:

A. Patient Identification: Patient Blood Type:

Patient Location: Physician:

Transfusion Service has received a properly identified pretransfusion sample: YES NO

UNITS PREPARED FOR TRANSFUSION OR TRANSPORT

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Comp</th>
<th>Blood Type</th>
<th>X-Match Complete</th>
<th>Prepared for Transport</th>
<th>Transfused</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I certify that the units of blood listed above have been stored at correct storage temperature and have not been out of control of the transfusion service. These units have been inspected for color and appearance and meet applicable standards.

Tech: _______Date: _______ Time: ________ Received by: _______

In compliance with the Code 01 Federal Regulations, the following must be filled out in total and signed by the physician.

D. PHYSICIAN’S REQUEST FOR UNCROSSMATCHED BLOOD

I base evaluated this patient’s condition and the risk of receiving blood or blood components prior to the completion 01 required testing. It is my judgement that the risk to this patient of delay in transfusion outweighs the benefit of completion of testing. I therefore authorize the release of this blood or blood component in to he administered as I have ordered. I understand dial the transfusion Service personnel will perform routine compatibility testing as soon as possible and they will report immediately to me any incompatibility they may find.

NATURE OF EMERGENCY PHYSICIAN: M.D. Date: Time:

If physician is unable to sign prior to transfusion, person authorized to make this request on their behalf must sign here, and obtain physician signature as soon as possible.

Signed: Date: Time
E. TRANSFUSION SERVICE RETURN OF UNUSED BLOOD AND BLOOD COMPONENTS

The above noted blood products were received into the transfusion service and the storage temperature was found acceptable as defined by applicable standards (RC 1-10°C): TEMP INDICATOR on RC OK. Comments

OK to accept: YES  NO  Received by:  Date: /  /  Time:

RECEIVING TRANSFUSION SERVICE TELEPHONE NUMBERS

Reviewed by:

Date:

EMERGENCY RELEASE OF BLOOD AND BLOOD COMPONENTS       TM0001 -FI (11/10)
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Obtaining Blood to Meet Emergency Situations

Policy:

When blood supply is insufficient to meet the needs in a life threatening emergency blood will be obtained from Sierra Vista Regional Health Center, Copper Queen Hospital or American Red Cross in the most expeditious manner possible.

Procedure:

1. Obtain the ABO and Rh of the patient.

2. Call Sierra Vista Regional Health Center (SVRHC) at (520) 458-4641 or Copper Queen Hospital at (520) 432-5383 to check availability of type specific blood or blood products.

3. Notify the technologist at SVRHC or CQH to pack products for pick-up and prepare paperwork for transfer. SVRHC, CQH will send one copy with products and one copy to the American Red Cross in Tucson.

4. Call the Sheriff’s Department and notify them of the emergency need for transportation of blood. Request the approximate time of pick-up. (See “Use of Cochise County Sheriff’s Department to Transport Blood” policy).

5. Call SVRHC or CQH and give them the approximate time of pick-up.

6. If blood cannot be obtained through SVRHC or CQH call the American Red Cross in Tucson. They will arrange transportation of the blood.

Effective Date: 1/1989

Reviewed Date: 1/1999, 7/1999

Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Use of Cochise County Sheriff's Department to Transport Blood

Policy:

A “life threatening emergency” exists when an insufficient supply of blood or blood products is available from our own inventory in a situation where there is an imminent danger of hemorrhage.

Procedure:

When a request for crossmatched packed cells or transfusion of other blood products is received proceed as follows:

1. Determine the patients ABO and Rh type.
2. Start antibody screen as soon as possible.
3. Check our inventory of blood. If enough ABO group Rh type specific blood is NOT available for the patient refer to Table 18-1 and Table 21-5 of the Technical Manual 15th Edition, 2005.

Table 18-1 Selection of Components when ABO-Identical Donors are not Available

<table>
<thead>
<tr>
<th>ABO Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Blood</td>
</tr>
<tr>
<td>must be identical to that of the patient</td>
</tr>
<tr>
<td>Red Blood Cells</td>
</tr>
<tr>
<td>must be compatible with the recipient’s plasma</td>
</tr>
<tr>
<td>Granulocyte Pheresis</td>
</tr>
<tr>
<td>must be compatible with the recipient’s plasma</td>
</tr>
<tr>
<td>Fresh Frozen Plasma*</td>
</tr>
<tr>
<td>must be compatible with the recipient’s red cells</td>
</tr>
<tr>
<td>Platelets Pheresis</td>
</tr>
<tr>
<td>all ABO groups are acceptable components compatible with the recipient’s red cells preferred</td>
</tr>
<tr>
<td>Cryoprecipitated AHF</td>
</tr>
<tr>
<td>all ABO groups are acceptable</td>
</tr>
</tbody>
</table>
### Table 21-5 Suggested ABO Group Selection Order of Transfusion of Plasma

<table>
<thead>
<tr>
<th>Recipient ABO Group</th>
<th>1st Choice</th>
<th>2nd Choice</th>
<th>3rd Choice</th>
<th>4th Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>AB</td>
<td>A</td>
<td>B</td>
<td>O</td>
</tr>
<tr>
<td>A</td>
<td>A</td>
<td>AB</td>
<td>B</td>
<td>O</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>AB</td>
<td>A</td>
<td>O</td>
</tr>
<tr>
<td>O</td>
<td>O</td>
<td>A</td>
<td>B</td>
<td>AB</td>
</tr>
</tbody>
</table>

The following table is from the 8th Edition of the Technical Manual concerning selection of alternative donor groups.

### Table 14-1 ABO Groups of Donor Blood

<table>
<thead>
<tr>
<th>Patient’s Group Group*</th>
<th>1st Choice</th>
<th>Alternative Donor Group*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st Choice</td>
<td>2nd Choice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>A(2) with anti-A active at 37 C</td>
<td>A(2)</td>
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<tr>
<td></td>
<td>B</td>
<td>B</td>
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<tr>
<td></td>
<td>AB</td>
<td>A or Brbc’s</td>
</tr>
<tr>
<td></td>
<td>O (Bombay)</td>
<td>none</td>
</tr>
</tbody>
</table>

*A fresh infusion set should be used whenever units of different ABO groups are given successively. Either group may be selected but only one of the two should be used for a given recipient. Group A usually more readily available than Group 13. If no more A blood is available Group O red blood cells may be given subsequently.

If the supply of ABO Group Rh type specific or alternative packed cells units is still not adequate, notify the physician stating the number of units that are available for crossmatch. Ask the physician if the situation warrants the declaration of a “life threatening emergency”. If the physician confirms this declaration still exists contact SVRHC or CQH to determine if they can ship to us enough units to satisfy our needs. If their inventory is insufficient contact the American Red Cross in Tucson.
If SVRHC or CQH can assist in our need, have them prepare for transport and notify the Sheriff's Department. Inform the dispatcher that the physician has declared that a “life threatening emergency” exists and that we need the transport of blood from SVRHC in Sierra Vista or CQH in Bisbee to Southeast Arizona Medical Center in Douglas. Relay to the physician an estimated time of arrival.

When either hospital is unable to totally satisfy our needs blood is available from the ARC in Tucson. Proceed as follows;

1. Contact ARC informing then that a “life threatening emergency” exists and you need transport of blood from ARC to our hospital by the most expeditious means available. Ask the dispatcher to contact you as soon as they establish a means of transporting the blood from ARC to CRH.

2. When an estimated time of arrival of the blood is established notify the physician.

In all situations be certain to inform the doctor when the blood arrives. Have available the “Emergency Request for crossmatched Blood” form in case the physician elects to transfuse any uncrossmatched blood.

When the situation is not a “life threatening emergency” but our inventory is not adequate to cover the need, arrange the transport of blood from ARC. Inform that doctor if there will be a delay in availability of crossmatched blood. Estimate when the crossmatched blood will be available.

Effective Date: 2/1984


Title: Returning Unused Blood

Policy:

No blood unit may be returned to the Blood Bank if:

1. It has been outside of the Blood Bank refrigerator for more than 20 minutes.
2. The unit has been opened.

If either of these conditions exists the unit will be discarded and the unit charged to the patient.

If the blood unit is returned unopened within 20 minutes of issue, it is acceptable for reissue. Note the time of return in the Blood Bank Record Log adjacent to the sign-out time and initial log. Relog the unit in the Blood Bank Record Log using correct receipt information.

Blood units are stored at 1 – 6 degrees C in the Laboratory. All blood bank records are retained for 5 years.

Effective Date: 1/1989


Revised: 10/2008, 11/2013, 06/2014
Title: Massive Transfusion

Policy:

It is the policy of Cochise Regional Hospital that after eight (8) units have been transfused to a patient within 24 hours will be necessary to confirm ABO compatibility of the patient and any subsequent transfused blood by performing an immediate spin crossmatch.

Procedure:

If an alloantibody was present in the patient’s pre-transfusion specimen confirmed antigen negative units should be used for immediate spin crossmatch. These units are available upon request by the American Red Cross in Tucson, Az. Patient will be charged for antigen typing in the computer system.

Effective Date: 1/1989

Title: Inventory, Acquisition and Return of Blood To American Red Cross (ARC)

Policy:

It is the policy of Cochise Regional Hospital to maintain an inventory, acquisition and return of blood and blood products through the American Red Cross.

Procedure:

The American Red Cross (ARC) has set up a bi-weekly delivery of fresh blood to our facility. At this time their driver also picks up blood delivered the previous two weeks for return to the ARC Center in Tucson.

If blood is needed from the ARC before the next scheduled delivery, it should be ordered by calling the ARC Hospital Orders in Tucson at (520)230 7344 and request that the blood be sent. Local courier can pick up blood in Tucson unless needed on an emergency basis. In the event of an urgent situation American Red Cross can utilize their courier for an extra charge. Anti-hemophilic Factor (AHF) and other blood components are also ordered in the same manner.

At the time of delivery the blood units and/or derivatives are to be checked against the shipping invoice. Any discrepancies shall be noted at this time and the ARC driver notified. The invoice with the unit numbers of blood units received will be filed in the BLOOD BANK INVENTORY LOGBOOK as well as the invoice for blood units and/or products returned. Record shall be maintained for a period of 5 years.

All units are to be typed prior to crossmatch to include ABO/Rh and Du testing. Each unit is to be tagged with an ABO/Rh checked sticker located in the Blood Bank. Technologist is to date and initial when performed.

ARC Hospital-to-Hospital Accounting Form shall be used to return blood to the ARC Distribution Center. The blood shall be returned via the ARC driver.

All blood shipped from the Laboratory shall be shipped in an ARC container and packed with a bag of ice. ARC Hospital-to-Hospital Accounting Form will be kept on file in the Laboratory.

The same procedure for acquisition and return of blood will be followed when received or shipped to another hospital. Record the name of the hospital in the BLOOD BANK INVENTORY LOGBOOK.

A copy of ARC Hospital-to-Hospital Accounting Form will be kept on file in the Laboratory.

Standing order for packed red blood cells are:
1. 10 units O positive
2. 8 units A positive
3. 2 units B positive
4. 6 units O negative
5. 2 units A negative

Eight (8) units of fresh frozen plasma are stored in the Laboratory freezer. These products will be replaced as used. All other blood products must be special ordered.

Effective Date: 2/1995
Title:  Jewett Refrigerator Alarm Activation

Policy:

It is the policy of Cochise Regional Hospital to maintain the Jewett Refrigerator Alarm system.

Procedure:

1. Check temperature of refrigerator. The temperature must fall in the 1-6 C range.

2. If the temperature is outside this range immediately pack all units in wet ice using a Red Cross Transportation Box or move to an available refrigerator system.

3. Call the Maintenance Department and Laboratory Manager if the blood storage refrigerator or alarm is malfunctioning.

4. Record all action taken on the chart of the 24 hour recording thermometer. All records will be kept for a period of 5 years.

NOTE: if the temperature of blood exceeds 9 C the blood cannot be issued for transfusion and needs to be destroyed.

References:


Effective Date:  1/1983


Title: HIV, HCV and CHAGAS Lookback Procedure

Policy:

It is the policy of Cochise Regional Hospital to notify any recipient of potentially infectious blood, blood products or tissues of the potential exposure in compliance with all regulatory standards.

Purpose:

All blood, blood products and tissues used for transfusion or infusion at Cochise Regional Hospital (CRH) are derived from donors who, at the time of donation, were tested for the presence of diseases which might be transmitted through their donation. Testing includes Human Immunodeficiency Virus (HIV-the virus responsible for AIDS), Hepatitis C (HCV) and Trypanosomal cruzi (a parasite responsible for the disease Chagas).

Although the tests utilized for HIV and HCV testing are very sensitive it is possible that the donation might have occurred very early in the donor’s disease when these tests are not sensitive enough to detect the presence of an infectious process. With the case of Chagas, the Chagas Prevalence Study protocol for donor testing has been reviewed and approved by the American Red Cross Institutional Review Board. The Board has considered the donor human subject aspects of this study and the FDA’s request to provide identification, notification and testing for recipients of prior components from confirmed positive donors.

The period of time between the initial infection and the development of changes sufficient enough for detection is known as the “window” period. Should an infected donor who made a donation through this window period return for a second donation at a later time, testing would then show positive results and would indicate the possibility that the donor might have been infectious at the previous donation. Should such a situation arise, the donor’s most recent donation would be subjected to an additional “confirmatory” test and if the infection is confirmed, Federal mandates require notification of the recipient of prior donations (donations within the previous 5 years) so that they might be tested for infection and counseled regarding the implications of the exposure, treatments available and ways to limit the spread of the disease to others.

Procedure:

In the event that the CRH Blood Bank is informed by the American Red Cross that potentially infectious products have been provided, Blood Bank personnel will:
1. Immediately advise the Medical Director of the Laboratory and the Laboratory Manager.

2. Immediately search through the Blood Bank stock to find any implicated unit(s).

3. If found quarantine the product and inform the American Red Cross in Tucson, Az by faxing accompanying notification form. The ARC will communicate what further action is to be taken.

4. If the implicated product is not in the Blood Bank inventory personnel shall reach all administration logs to locate the product.

5. If the implicated product has been provided to a recipient’s Blood Bank personnel shall obtain the name of the recipient, the date the product was provided to the patient and the name of the ordering/attending physician.

6. The information regarding the implicated product to include the case identification number (provided by ARC), disposition of the product, name of recipient (if product was transfused), date transfused and the recipient’s physician shall be recorded on the Lookback Documentation Form provided by the Red Cross.

7. Once this information is obtained, the partially completed form shall be given to the Laboratory Manager who will then initiate the notification process.

8. Notification will preferably be done through the patient’s attending/ordering physician. If the physician is unavailable or unwilling to make notification of recipient, this notification will be the responsibility of the Laboratory Manager or designee.

9. Notification shall be given to the recipient or if deceased; a minor or incompetent, the notification shall be given to the recipient’s legal representative. This process must include at least three separate attempts. Each attempt must be documented with the date, manner of notification, result of notification and name of person attempting the notification on the lookback documentation form.

10. If the patient is not readily available at least 3 attempts in one week shall be made to make contact. If both the physician and/or the recipient are not found within an eight (8) week period the hospital/laboratory is not expected to continue its search. It will be up to the laboratory to decide to extend the number of attempts.

11. If the physician accepts responsibility for notifying the recipient they are not required to inform the lab if notification occurred or not.

12. If the laboratory was informed by the physician that notification did not occur then the responsibility of notification falls on the laboratory. Responsibility is relinquished only after the laboratory has made three attempts to locate/contact the patient in one week during an 8 week period.
13. Once patient has been located/contacted information for testing and counseling shall be given. Information pertaining to fees, identification process, physician request forms or any residency requirements must be provided. The CDC has a national Aids Hotline that can be reached at 1-800-342-2437, 24 hrs/day. The patient may also be referred to the CDH Clinic for further counseling or treatment


Revised Date: 12/2006, 10/2008, 11/2013, 06/2014
Discontinued procedure 11/25/2013 VS

Cochise Regional Hospital

Title: Cell Washer Operation

Procedure:

WASH CYCLE:

1. Place tubes to be washed in the holders of the centrifuge rotor.
2. Balance the rotor using appropriate balance tubes as necessary.
3. Close the cover.
4. Press the “WASH” function key. The display will indicate 0000 rpm, WASH 3 function and 0.34 time. If a wash cycle other than 3 washes is desired press the appropriate key (1, 2, 3 or 4) on the numeric key board. That cycle will appear in the function display.
5. Press the “START/STOP” key.

SPIN CYCLE:

1. Place tubes to be centrifuged in the holders of the rotor. Balance as above.
2. Close the cover.
3. Press the “SPIN” function key. The display will indicate a 1000 ref (relative centrifugal force) spin function. SPIN and 0.20 (20 seconds) will appear on the displays.
4. Press the “START/STOP” key.

NOTE: Please see operators manual for maintenance, troubleshooting or any other items of interest for the Dade Automatic Centrifuge H. If the operators manual cannot be utilized for problems or concerns contact the Maintenance Department in order to contact biomedical engineers.
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Thermometer Calibration Checks

Policy:

Thermometer calibration checks are performed yearly by the Laboratory personnel.

Both calibration thermometer’s are kept in the Blood Bank.

Procedure:

1. Place appropriate calibration thermometer next to the thermometer currently in use that is to be checked.

2. Wait one hour and check to make sure the “in use” thermometer is the same as the calibration thermometer.

3. If it agrees document and place back in use.

4. If it does not agree replace thermometer immediately and document corrective action.

5. Check new thermometer’s calibration and document before placing into use.

References:

Cochise Regional Hospital

Title: D50 Fluid Warmer Policy

Purpose:
To provide safe warming of blood and IV fluids as they are administered to patients at low flow rates.

Policy:
It is the policy of Southeast Arizona Medical Center to use a safe heating system for warming blood and IV fluids as they are administered to patients at low flow rates, according to manufacturer’s directions.

The fluid warmer is designed to deliver fluids at normothermic temperatures at low flow rates, providing active warming of the patient line and nearly eliminates cooloff. The active warming is achieved by surrounding the patient line with precisely temperature controlled circulating water. (The water flows through its own pathways which completely surround the IV line at a maximum temperature control to 42 C.

Equipment:
1. Fluid warmer unit securely clamped to IV pole.
2. Fluid warming set.
3. IV solution
4. Connection IV tubing
5. 3 way stopcock
6. J-loop and IV jelco #16 or 18 gauge.

Procedure:
1. Follow set up and priming instructions provided on the back of the level I D-50 normothermic fluid administration set, Plug unit into electrical outlet. **These procedures require that aseptic techniques be followed when spinning and connecting the system to a patient IV port.
2. Insert the heat exchanger into the bottom heat exchanger socket labeled #1
3. Slide up heat exchanger socket #2.
4. Proceed to snap in place the heat exchanger then slide down heat exchanger #2.
5. Attach the filter/air eliminator to the right side of the level 1 fluid warmer box.

6. Turn the level 1 System 250 Fluid Warmer on, (This takes about 3 minutes for the system to reach operating temperature).

7. After to be sure there is not air in the patient line open the roller clamps, then turn on the power switch located at the middle lower front of warmer unit.

8. Observe the display panel for any mechanical complications and appropriate temperature. Delivery temperature preset is between (98.6 F to 104 F) 39 C to 40 C at a rate of 250 ml/min or crystalloids at a rate of 300 ml/min.

9. For further detailed information about the level 1 250 fluid warmer system refer to operator’s manual located attached to warmer system.

10. Follow SAMC policy on blood product administration and proper form for documentation.

**WARNING:** All air must be removed from fluid lines prior to connection to patient.

Care and Maintenance of Unit

Daily Maintenance Tasks

1. Routinely clean the unit after EVERY USE with mild detergent, water and soft cloth.

2. It is recommended for external disinfecting hospital approved cleaning disinfectant agent be used.

3. Usually check condition of unit before EACH USE.

4. Lubricate O-rings

5. Using cotton swab apply a small amount of silicone grease to the 0-rings.

6. Test alarm switch.

Quarterly Maintenance Tasks — (to be done by Bio-Med)

1. Replace 0-ring seals.

2. Change distilled water.

3. Test alarm switch, float switch and disposable switch over temperature alarm.

4. Verify temperature calibration per manufactures guidelines.
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Pipette Calibration

Policy:
It is the policy of Cochise Regional Hospital to perform pipette calibration twice a year.

Materials:
1. Scienceware Pipetter Accuracy Test Kit
2. Pipettes
3. pipette tips
4. distilled water.
5. Kimwipes

Procedure:
1. Attach the yellow adapter for volumes up to 100 ul
2. Attach the blue adapter for volumes between 200 ul and 1000 ul.
3. With arrow pointing towards the pipette insert capillary into the opposite end
4. Depress push button to first positive stop.
5. Emerse into distilled water, wait a moment, then withdraw the capillary from the water
6. Examine level of liquid. Ensure it corresponds with the graduation mark.

1. If it does-label pipette with date and initials and return to use.
2. If it does not-discontinue use and send to manufacturer or suitable institution for calibration.

References:
1. Scienceware Pipetter Accuracy Test Kit.
Cochise Regional Hospital

Laboratory- Blood Bank Policies and Procedures

Title: Use of Blood and Blood Products

Policy:

It is the policy of Cochise Regional Hospital to obtain an informed consent prior to the transfusion of blood or blood products to include whole blood, packed red blood cells, fresh frozen plasma, platelets, cryoprecipitate, white blood cells, albumin and factor 8. A refusal of consent for transfusion of blood or blood products shall be obtained on all refusals for transfusion of blood or blood products.

Cochise Regional Hospital shall utilize the components and services of the American Red Cross Blood Services Arizona Region in Tucson, Az. (see Inventory, Acquisition and Return of Blood Policy)

It shall be the responsibility of the nursing staff to notify the laboratory if crossmatched blood is no longer needed and can be released for use by other individuals.

In the event of a life-threatening emergency, the laboratory may release blood on a patient that is not using it to meet the requirements of the emergency situation. All blood will be automatically released 48 hours after it has been crossmatched.

Reviewed:  2/98, 11/01, 2/04, 12/06, 12/07

Revised:  2/98, 2/01, 10/08, 11/13, 06/14
Reviewed and Approved by:

Veronica Santiago
Laboratory Manager

Approval Date: 7/1/14

Approved by the Board

Seth Guterman MD
Chairman of the Board

Approval Date: 7/15/14