TRAINING UPDATE

Lab Location:	SGAH and WAH	**Date Implemented:**	11.14.2013
Department:	Blood Bank	**Due Date:**	11.30.2013

DESCRIPTION OF PROCEDURE REVISION

Name of procedure:
ABO Discrepancies
Description of change(s):

1. Form has been updated. Note that boxes are greyed out for testing that does not need to be performed when each specific technique it used.
   You do not need to perform testing in each row. However, if you use a particular technique, you must fill in all boxes in that row. Why? Some boxes are needed to interpret a method while others act as controls for the method.

2. When you enter an ABO discrepancy, enter the **FINAL** testing results in the grid and add a comment indicating what you did to resolve. For example, "Extra reactivity in reverse grouping resolved with pre-warm."

3. Wording throughout the procedure was updated for clarity.

Quest Diagnostics

○ Shady Grove Adventist Hospital, Rockville, MD
○ Washington Adventist Hospital, Takoma Park, MD

ABO Discrepancy Worksheet

Patient Name		MRN
Testing Date	Tech	Historical Blood Type
Transfusion History		Transplant History
Pregnant or Transfused in Last 3 Months?		
Diagnosis		Patient Age

Original Results (Echo or Manual Tube—Circle One)

Anti-A	Anti-B	Anti-D	A_1 Cell	B Cell	Albumin	Interpretation

ABO Discrepancy Workup

	Anti-A	Anti-B	Anti-D	A_1 Cell	B Cell	Albumin	SC1	SC2	SC3	Auto	Interp
Repeat ABO with screen/auto											
Extended Incubation at RT											
Extended Incubation at 1-6°C											
Washed PATIENT Cells											
Saline Replacement											
Washed REAGENT Cells											
Antigen Negative Reverse Cells											
Pre-warmed Plasma											

Enter final (resolved) discrepancy results in computer with a comment indicating resolution. For example, "Reverse cells tested using extended incubation at 4C."

A_1 Lectin Testing

A1 Typing is treated the same as antigen typing. Document on an antigen typing form then enter and bill in LIS per antigen typing procedure. NA1 = A_1 negative PA1 = A_1 positive

Anti-A_1 Antibody Testing

	Pos Ctrl	Neg Ctrl	A_1 Cells			A_2 Cells		
	Conf Ab	Albumin	1	2	3	1	2	3
Lot Number								
Expiration Date								
Patient Result								
Positive Control (Conf Ab)								
Negative Control (Albumin)								

If anti-A_1 identified, enter in computer as antibody identification "AA1"

Reviewed By:_____ **Date:**_____

Non-Technical SOP

Title	**ABO Discrepancies**	
Prepared by	Stephanie Codina	Date: 12/7/2009
Owner	Stephanie Codina	Date: 12/7/2009

Laboratory Approval		
Print Name and Title	**Signature**	**Date**
Refer to the electronic signature page for approval and approval dates.		
Local Issue Date:	Local Effective Date:	

Review:		
Print Name	**Signature**	**Date**

TABLE OF CONTENTS

1. PURPOSE

The forward and reverse ABO groupings should agree to be considered valid. This procedure outlines the general approach that should be taken when an ABO discrepancy is discovered.

2. SCOPE

Applies to any patient specimen whose ABO forward and reverse groups do not agree.

3. RESPONSIBILITY

All blood bank staff must demonstrate competency for ABO forward and reverse typing, recognizing discrepancies, and the processes to resolve.

4. DEFINITIONS

ABO Discrepancy-- An ABO discrepancy exists when the results of the forward grouping tests do not agree with those of the reverse grouping tests. A discrepancy is generally caused by unexpected negative or unexpected positive results in either the forward or reverse grouping.

Forward (front) grouping – Testing of RBC's with anti-A and anti-B

Reverse (back) grouping – Testing of plasma with reagent A_1 and B cells

5. PROCEDURE

5.1 General Guidelines

Step	Action
1	Do not interpret the blood type until the ABO discrepancy is resolved.
2	**If transfusion is pending:** **A. If possible, ask the patient care area to delay transfusion until the ABO discrepancy is resolved.** **B. If the clinical condition of the patient makes it necessary to transfuse before the problem is resolved, only transfuse group O red cells of the appropriate Rh type and group AB plasma products.** **a. Request additional sample prior to transfusion if needed.** **b. A signed emergency release card is required.**
3	A specimen may be sent to the American Red Cross reference lab for testing if the discrepancy cannot be resolved on site.

5.2 Initial Testing

Step	Action
1	Repeat the forward and reverse ABO grouping on the same specimen per procedure. A. If discrepancy is resolved, report results. B. If discrepancy remains, continue with step 2.
2	Consider and resolve any technical factors that may have contributed to the discrepant ABO results. A. Improper reagent storage B. Incorrect technique C. Use of incorrect reagent D. Omission of antisera E. Contaminated antisera
3	Contact the nurse to obtain the patient history. Determine the following and document on the ""ABO Discrepancy Worksheet." A. Patient's historical blood type from LIS (if available). Historical blood types from outside locations cannot be accepted. B. Transfusion history (name/location of hospital if transfused at another institution) C. Transplant history (name/location of hospital if transplant occurred) D. Pregnancy history E. Patient's diagnosis F. Patient's age

Step	Action
4	Determine the most likely cause of the typing discrepancy and follow the steps in that section of the procedure. Refer to flow charts as necessary. Document all testing on the ""ABO Discrepancy Worksheet." A. Weak/missing red cell reactivity B. Extra red cell reactivity C. Mixed field red cell reactivity D. Weak/missing plasma reactivity E. Extra plasma reactivity Note: It is not necessary to fill in every row of the form. However, if a technique is used, all columns in that row need to be completed.

5.3 Weak/Missing Red Cell Reactivity

Step	Action
1	The causes of weak/missing red cell reactivity include: A. ABO subgroup B. Leukemia/malignancy (causes weak expression of red cell antigens) C. Transfusion of out-of-group red cells D. Intrauterine fetal transfusion E. Transplantation F. Excessive soluble blood group substance
2	Repeat the ABO typing with an extended incubation. A. Set up tubes for both ABO forward and reverse typing per procedure. Include an autocontrol and tubes for testing screen cells I, II, and III. B. Incubate all tubes at room temperature for 10-30 minutes, serofuge, and read using an agglutination viewer. C. If any of the screen cells or autocontrol is positive, the results are NOT valid. Proceed to section, "Extra Plasma Reactivity." D. If the discrepancy a. Resolves, report results. b. Remains, proceed to step 3.
3	Repeat the ABO typing with an extended incubation and decrease the temperature. A. Set up tubes for both ABO forward and reverse typing per procedure. Include an autocontrol and tubes for testing screen cells I, II, and III. B. Incubate all tubes in the refrigerator at 1-6°C for 10-30 minutes, serofuge, and read using an agglutination viewer. C. If any of the screen cells or autocontrol is positive, the results are NOT valid. Proceed to section, "Extra Plasma Reactivity." D. If the discrepancy a. Resolves, report results. b. Remains, proceed to step 4.

Step	Action
4	Determine if the patient is a subgroup of A by testing the patient cells against A_1 lectin per antigen typing procedure unless the patient already has A_1 antigen typing on file. A_1 lectin controls must be run on each day of use. Note: This ONLY applies when the patient appears to be group A or AB. Do not perform A lectin testing on patients who appear to be group B or O. Subgroups of B are rare and should be referred to a reference laboratory for testing and interpretation. A. If the patient tests negative with A_1 lectin, a. Enter the antigen typing result as "NA1" b. Interpret the front type as A or AB as appropriate. c. Understand that the patient is actually a subgroup of A ($A_{subgroup}$ or $A_{subgroup}B$). d. Transfuse A_1-negative or group O red blood cells and A or AB plasma. B. If the patient tests positive with A_1 lectin, a. Enter the antigen typing result as "PA1" b. Proceed to step 5.
5	Weak expressions of ABO antigens have been noted in certain leukemias. Consult with the Blood Bank Medical Director or supervisor if the patient has a diagnosis of leukemia.
6	If the discrepancy is still unresolved, refer the specimen to a reference laboratory for discrepancy resolution. ABO antigens may be weakly expressed: A. When the patient has inherited a rare allele at the ABO locus. B. When the patient has inherited a variant H gene, which controls the development of H substance and A&B antigen development.

5.4 Extra Red Cell Reactivity

Step	Action
1	The causes of extra red cell reactivity include: A. Autoagglutinins/excess protein coating the red cells B. Unwashed red cells: plasma proteins C. Unwashed red cells: antibody in patient's plasma to reagent constituent D. Transplantation E. Acquired B antigen F. B(A) phenomenon G. Out-of-group transfusion

Step	Action
2	Wash the PATIENT red cells in saline 3-4 times and repeat testing. A. Label a test tube with the patient's identifiers. Labeling standards are detailed in the policy 'Sample Specifications for Blood Bank Testing'. B. Place a small amount (1-3 drops) of red cells in the test tube. C. Fill the tube ¾ full with saline. D. Mix well. E. Serofuge for the appropriate time listed on the serofuge (generally 1 minute). F. Decant saline. G. Repeat steps C-F and additional 2-3 times. If discrepancy resolves, report results. If discrepancy remains, proceed to step 3.
3	If the extra reaction appears in the A tube, test the patient with A_1 lectin to determine if an A subgroup exists unless the patient already has A_1 antigen typing on file. A_1 lectin controls must be run on each day of use. A. If the patient tests negative with A_1 lectin, a. Enter the antigen typing result as "NA1" b. Interpret the front type as A or AB as appropriate. c. Understand that the patient is actually a subgroup of A ($A_{subgroup}$ or $A_{subgroup}B$). d. Transfuse A_1-negative or group O red blood cells and A or AB plasma. B. If the patient tests positive with A_1 lectin, e. Enter the antigen typing result as "PA1" f. Proceed to step 4.
4	Refer the sample to a reference lab to additional testing. A. In B(A) phenotype, red blood cells from group B individuals with high levels of galactosyltransferase are agglutinated by some anti-A reagents. This is resolved by testing with different clones of anti-A antisera. B. Some bacterial infections can cause polyagglutination (though rare with monoclonal reagents). Determine whether the patient has an infection such as septicemia or gastrointestinal lesion.

5.5 Mixed Field Red Cell Reactivity

Step	Action
1	The causes of mixed-field reactivity include: A. Recent transfusion B. Transplantation C. Fetomaternal hemorrhage D. Chimerism

Step	Action
2	Review the patient's transfusion history for the previous 3 months to determine if the patient was transfused with out-of-group red blood cells. Obtain the transfusion history from another institution if applicable. Document the history on the ""ABO Discrepancy Worksheet." Determine whether the patient's type and the donor's type can account for the mixed-field reactions seen. For example, type A-positive recipient who receive type O-negative red blood cells may demonstrate mixed-field reactions with both the anti-A and anti-D reagents (forward type). A. If yes, report of the mixed field result with the comment, "Patient received (list number of units and blood type of red blood cells transfused) on (list date). B. If no, proceed to step 3.
3	Determine whether the patient received a hematopoietic progenitor cell transplant (bone marrow, cord blood, stem cell, etc.) A. If so, determine the location of transplant, date of transplant, and blood type of the donor. a. If the recipient/donor blood types explain the mixed-field reaction, report results with the comment, "Patient received a (list type) transplant on (list date) at (list hospital) from a group (list blood type) donor." b. Add a comment to the Blood Bank Administrative Data file indicating that the patient MUST receive red cells and plasma products compatible with both the patient and the donor. For example, if a group O recipient received a bone marrow transplant from a group A donor, the following comment would be added, "Give group O red cells and group A or AB plasma products." B. If no, proceed to step 5.
4	Determine whether the patient is pregnant or recently delivered. If so, request a Kleihauer-Betke be ordered and performed to determine if a feto-maternal hemorrhage has occurred.
5	There is a very small possibility that a person demonstrating mixed-field or dual population results is a chimera. This may be considered if the patient was a twin in utero. However, this is an uncommon scenario. This can be proven with cytogenetic testing if the Blood Bank Medical Director or designee feels the testing is necessary.
6	Refer the specimen to a reference laboratory for additional testing. RBC separation techniques can be used to separate the two RBC populations.

5.6 Weak/Missing Plasma Reactivity

Step	Action
1	The causes of weak/missing plasma reactivity include: A. Age (<4-6 months old) B. ABO subgroup C. Hypogammaglobulinemia D. Transplantation
2	Determine the age of the patient. Infants generally do not make ABO antibodies until the age of 4-6 months. Antibodies found prior to this age are generally of maternal origin. A. If the patient is <6 months old, result the reverse group (A_1 and B cell results) as "." for neonatal backtype. B. Interpret the ABO type based on the forward grouping results. C. Add the following blood bank comment to the patient's Blood Bank Administrative Data file, "Reverse group undetectable due to patient age. Give group O red blood cells and AB plasma products until ABO discrepancy resolves." D. No additional testing is necessary.
3	Repeat the ABO typing with an extended incubation. A. Set up tubes for both ABO forward and reverse typing per procedure, "ABO Group." Include an autocontrol and tubes for testing screen cells I, II, and III. B. Incubate all tubes at room temperature for 10-30 minutes, serofuge, and read using an agglutination viewer. C. If any of the screen cells or autocontrol is positive, the results are NOT valid. Proceed to section, "Extra Plasma Reactivity." D. If the discrepancy a. Resolves, report results. b. Remains, proceed to step 4.
4	Repeat the ABO typing with an extended incubation and decrease the temperature. A. Set up tubes for both ABO forward and reverse typing per procedure, "ABO Group." Include an autocontrol and tubes for testing screen cells I, II, and III. B. Incubate all tubes in the refrigerator at 1-6°C for 10-30 minutes, serofuge, and read using an agglutination viewer. C. If any of the screen cells or autocontrol is positive, the results are NOT valid. Proceed to section, "Extra Plasma Reactivity." D. If the discrepancy a. Resolves, report results. b. Remains, proceed to step 5.

Step	Action
5	If the weak or missing reaction appears to be the reaction with the A_1 cell, test the patient with A_1 lectin lectin per antigen typing procedure to determine if an A subgroup exists unless the patient already has A_1 antigen typing on file. A_1 lectin controls must be run on each day of use. A. If the patient tests negative with A_1 lectin, a. Enter the antigen typing result as "NA1" b. Interpret the front type as A or AB as appropriate. c. Understand that the patient is actually a subgroup of A ($A_{subgroup}$ or $A_{subgroup}B$). d. Transfuse A_1-negative or group O red blood cells and A or AB plasma. B. If the patient tests positive with A_1 lectin, e. Enter the antigen typing result as "PA1" f. Proceed to step 6.
6	Determine if the patient has an immune deficiency or hypogammaglobulinemia. If yes, consult with the Blood Bank Medical Director or Supervisor for further instructions.
7	Patients with high titer (>5000) IgG anti-A and/or anti-B may be non-reactive with A_1 or B cells by immediate spin technique. In this situation, complement causes a steric hindrance of agglutination. This can be resolved by using a sample collected in EDTA anticoagulant. If serum was used for initial ABO typing, have the sample recollected in an EDTA tube and repeat.
8	Refer the sample to a reference laboratory for testing if the discrepancy is not resolved. Occasionally, the A and B antigens can be expressed so weakly that weak anti-A or –B antibodies develop.

5.7 Extra Plasma Reactivity

Step	Action
1	The causes of extra plasma reactivity include: A. Anti-A_1 antibodies in a patient who is an $A_{subgroup}$ or $A_{subgroup}B$ (Note: This does not apply to patients who appear to be group O or B) B. Cold autoantibody (anti-I or anti-H) C. Cold alloantibody (anti-P_1, anti-M, anti-N, anti-Le^a, anti-Le^b) D. Serum antibody to reagent constituent E. Excess serum protein F. Transfusion of plasma components G. Transplantation H. Infusion of IVIG

Step	Action
2	Look at the tubes microscopically to rule out rouleaux formation. If positive, perform a saline addition or saline replacement per proceudure, "Saline Replacement Technique." Note: Rouleaux will look like a stack of coins under the microscope.  When rouleaux is present, you will generally see it in **all** tubes containing patient plasma. A. If discrepancy resolves, report as rouleaux and interpret the blood type. B. If discrepancy remains, proceed to step 3.
3	Consider an Anti-A_1 antibody if the extra reactivity is on the A_1 cell. A. Test the patient with A_1 lectin to determine if an A subgroup exists per antigen typing procedure. A_1 typing does not need to be performed if the patient has A_1 antigen typing on file. B. Test the patient's plasma against A_1 and A_2 cells to rule out an anti-A_1 antibody. Note: Expired reagent A_1 and A_2 cells may be used. However, at least one lot number of each cell tested must have a current expiration date. a. Label 6 tubes with the patient's identifiers as outlined in procedure, "Sample Specifications for Blood Bank Testing." b. Label 3 tubes with "A1" and the other 3 tubes with "A2." c. Write the lot number of each A_1 cell on one of the tubes labeled A_1. Write the lot number of each A_2 cell on one of the tubes labeled A_2. d. Place 2 drops of patient plasma in each tube. e. Place 1 drop of the appropriate reagent A_1 or A_2 red cell in each tube and gently mix. f. Serofuge for the immediate spin time listed on the serofuge (generally 15 seconds). g. Resuspend the cells and grade reactions with the aid of an agglutination viewer. C. To identify an anti-A_1 antibody, a. The patient's cells should be negative for the A_1 antigen when tested with A_1 lectin. Note: this only applies when the patient appears to be group A or AB. Do not perform when the patient appears to be group O or B. **and** b. The plasma should be positive with at least 3 examples of A_1 cells (rule-in) and negative with at least 3 examples of A_2 cells (rule-out). D. If the discrepancy resolves, a. Order an antibody identification and interpret as anti-A_1. b. Order antigen typing and result the patient as A_1-negative. E. If the discrepancy remains, proceed to step 4.

Step	Action
4	Pre-warm the plasma and test reagents and repeat. A. Place 15-20 drops of test plasma in a labeled test tube and incubate at 37°C for 10 minutes. B. Place 1 drop of reagent A_1 cells in a labeled test tube and incubate at 37°C for 10 minutes. C. Place 1 drop of reagent B cells in a labeled test tube and incubate at 37°C for 10 minutes. D. Perform a reverse grouping on the pre-warmed reagents per procedure. a. If discrepancy resolves, report the ABO type. b. If discrepancy remains, proceed to step 5.
5	Perform and antibody screen on the plasma (if not previously ordered). Include BOTH an autocontrol and a reading at the immediate spin phase. Cold antibodies often interfere with reverse grouping. A. If the antibody screen is positive, a. Identify the antibody(-ies) causing the positive reaction. b. Antigen type group A and B red cell units for the antigens corresponding the antibody(-ies) identified. c. Perform a backtype on the patient plasma against the antigen-negative A and B red cells (as if they were reagent reverse cells) and interpret. i. Report the blood type if the discrepancy resolves. ii. Proceed to step 6 if the discrepancy remains. B. If the antibody screen is negative, proceed to step 6.
6	Repeat the testing with washed reagent red blood cells. A. Wash the reagent red blood cells (A_1, B cells and screen cells I, II, II) 3-4 times in the cell washer and decant to a dry button. B. Repeat reverse typing per procedure and include an autocontrol. a. If the discrepancy resolved, report the ABO type and add a comment to the patient's Blood Bank Administrative Data file indicating that the patient likely has an antibody to a preservative in the reagent red blood cells. b. If the discrepancy remains, proceed to step 7.
7	Refer the specimen to a reference laboratory for testing.

5.8 Computer Entry

Step	Action
1	Enter results per procedure. Record final (post-workup) reaction results in the ABO grid and interpret the blood type. Add a comment indicating what actions were taken to resolve the discrepancy. For example, "Reverse cells tested using extended incubation at 4°C."

6. RELATED DOCUMENTS

Form: ABO Discrepancy Worksheet (AG.F262)
SOP: ABO/Rh Testing Manual Tube
SOP: Antigen Typing
SOP: Saline Replacement Technique

7. REFERENCES

Roback, J.D., Grossman, B.J., Harris, T., and Hillyer, C.D. (2011). AABB Technical Manual, 17th edition. AABB Publishing, Bethesda, Maryland.

Standards for Blood Banks and Transfusion Services, 28th ed., 2012. AABB Publishing, Bethesda, Maryland.

8. REVISION HISTORY

Version	Date	Reason for Revision	Revised By	Approved By
		Supersedes SWB.017.000		
000	11.5.2013	Section 5.8 Changed LIS entry so final (post-discrepancy resolution) results are entered into the LIS with a comment about how the discrepancy was resolved instead of entering pre-resolution results and answering QA failure. Updated wording throughout procedure for clarity and to reflect updates to the form.	SCodina	NCacciabeve NCacciabeve
		Footer: version # leading zero's dropped due to new EDCS in use as of 10/7/13.	LBarrett	

9. ADDENDA AND APPENDICES

A. Resolution of the Most Commonly Encountered ABO Discrepancies
B. ABO Discrepancy Resolution Initial Testing Process
C. Weak/Missing Red Cell Reactivity Process
D. Extra Red Cell Reactivity Process
E. Mixed-Field Red Cell Reactivity Process
F. Weak/Missing Plasma Reactivity Process
G. Extra Plasma Reactivity Process

Appendix A
Resolution of the Most Commonly Encountered ABO Discrepancies

Cold Antibody Interfering With Blood Typing

A. Initial Results

Generally, you will see extra reactions in the backtype, but strong cold antibodies can interfere with the front type also. Examples include:

- Cold antibodies such as anti-P_1, anti-M, or anti-$Le^{a\ or\ b}$ that react with P_1, M, or Le antigens on the A_1 and/or B cells.

  Example:

Anti-A	Anti-B	A1 Cell	B Cell
4+	0	2+	4+

- Cold antibodies such as anti-I or anti-H that react with antigen sites on all cells.

  Example:

Anti-A	Anti-B	A1 Cell	B Cell
4+	0	4+	4+

- Strong cold antibodies that interfere with both forward and reverse type.

  Example:

Anti-A	Anti-B	A1 Cell	B Cell
4+	4+	4+	4+

B. Resolution (specific procedures can be found in section "Extra Plasma Reactivity").

1. Look at the tubes microscopically to rule-out rouleaux formation. Perform saline addition/saline replacement if indicated.
2. Pre-warm the plasma and repeat to resolve reverse grouping discrepancy. Wash cells in warm saline to resolve forward grouping discrepancy.
3. Perform an antibody screen to identify antibody involved. Retest reverse group using A_1 and/or B cells that are negative for the antigen that corresponds to the antibody identified.
4. Refer the specimen to a reference laboratory if the discrepancy does not resolve.

Weak or Missing Backtype

A. Initial Results

Generally, you will see a reverse type that is <2+ in strength or a missing backtype.

Example:

Anti-A	Anti-B	A1 Cell	B Cell
3+	0	0	0 or 1+

B. Resolution (specific procedures can be found in section "Weak/Missing Plasma Reactivity").

1. Determine the age of the patient. If patient <6 month old, no workup is necessary.
2. Repeat ABO typing with extended room temperature incubation.
3. Repeat ABO typing with extended incubation at decreased temperature.
4. Consult Blood Bank Medical Director or designee if patient has a diagnosis of immune deficiency or hypogammaglobulinemia.
5. Refer to a reference laboratory if the discrepancy does not resolve.

A_2 or A_2B with an Anti-A_1 Antibody

A. Initial Results

Generally, you will see a patient who appears to be group A but you are seeing week reactions with the A_1 cell

Example:

Anti-A	Anti-B	A1 Cell	B Cell
3+	0	1-2+	3-4+

Or a patient who appears to be group AB but you are seeing weak reactions with the A_1 cell.

Example:

Anti-A	Anti-B	A1 Cell	B Cell
3+	4+	1-2+	0

B. Resolution (specific procedures can be found in section "Extra Plasma Reactivity or Extra Red Cell Reactivity").

1. Test the patient's cells with A_1 lectin. If the patient is an A subgroup, the A_1 lectin reaction will be negative.
2. Test the patient plasma against 3 examples of A_1 cells (rule-in) and 3 examples of A_2 cells (rule-out). If the A1 cells are positive and the A_2 cells are negative, you should call an anti-A_1 antibody.

Group A or B Patient Who Received An O-Negative Red Blood Cell Transfusion and Now Demonstrates Mixed-Field Reactivity

A. Initial Results

Generally, you will see mixed-field reactivity in the Anti-A tube if the patient is group A.

Example:

Anti-A	Anti-B	A1 Cell	B Cell
MF	0	0	3-4+

Or mixed-field reactivity in the Anti-B tube if the patient is group B.

Example:

Anti-A	Anti-B	A1 Cell	B Cell
0	MF	3-4+	0

Or mixed-field reactivity in both the Anti-A and Anti-B tubes if the patient is group AB.

Example:

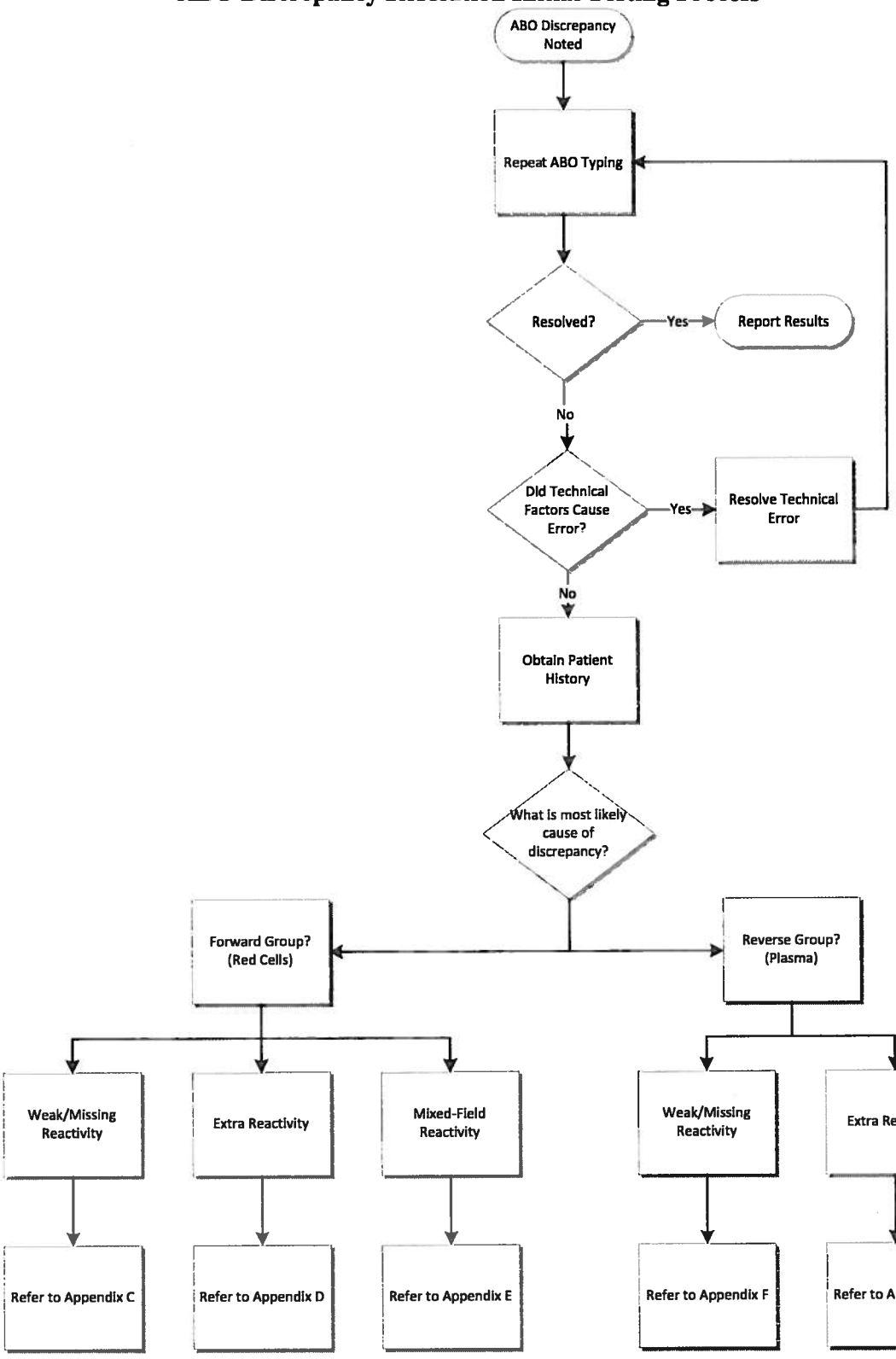
Anti-A	Anti-B	A1 Cell	B Cell
MF	MF	0	0

The Anti-D tube will also show mixed-field reactivity in Rh-positive recipients who receive Rh-negative red blood cells.

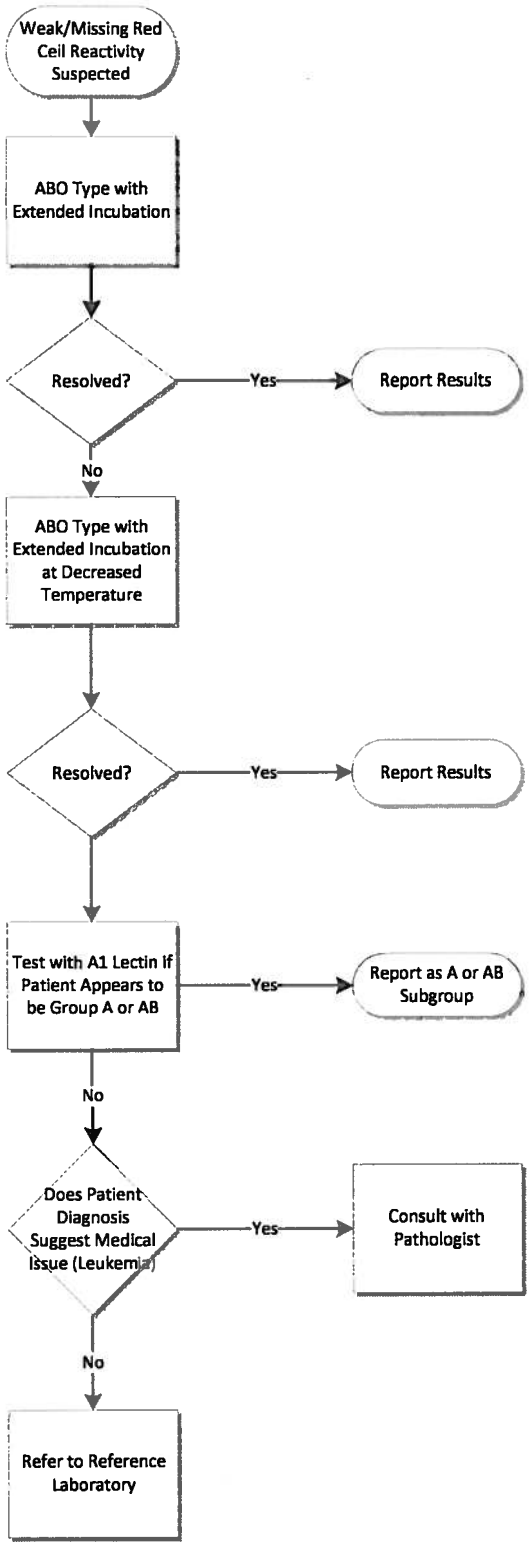
B. Resolution

Ensure patient received a recent red blood cell transfusion of a blood type that can explain the mixed-field reactions and place a comment on the specimen explaining the results.

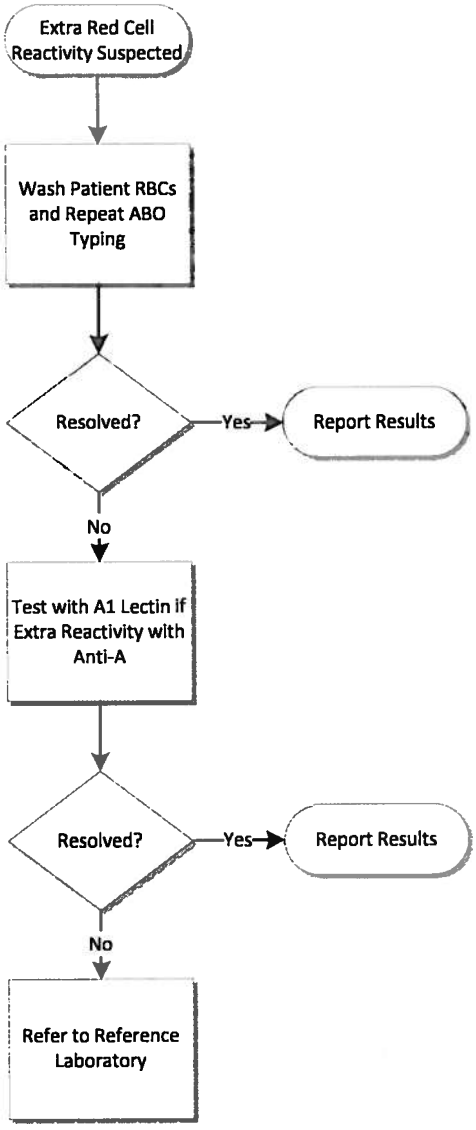
Appendix B
ABO Discrepancy Resolution Initial Testing Process



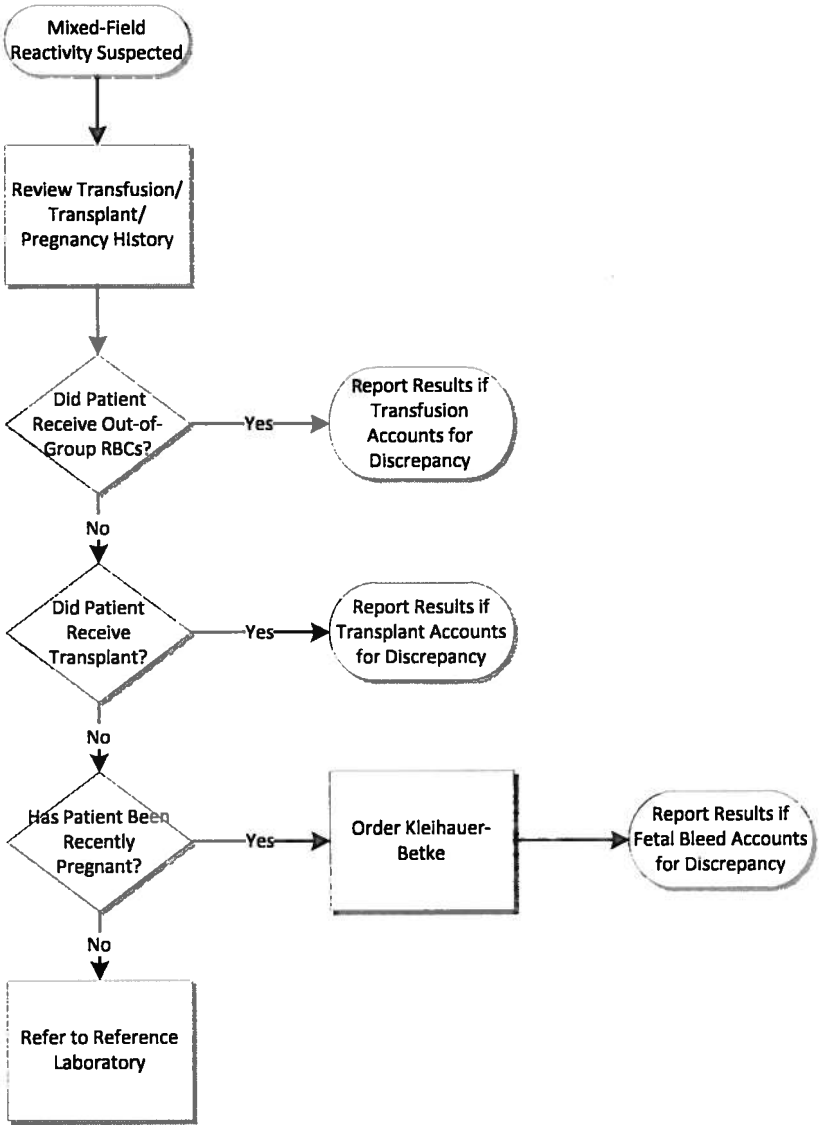
Appendix C
Weak/Missing Red Cell Reactivity Process



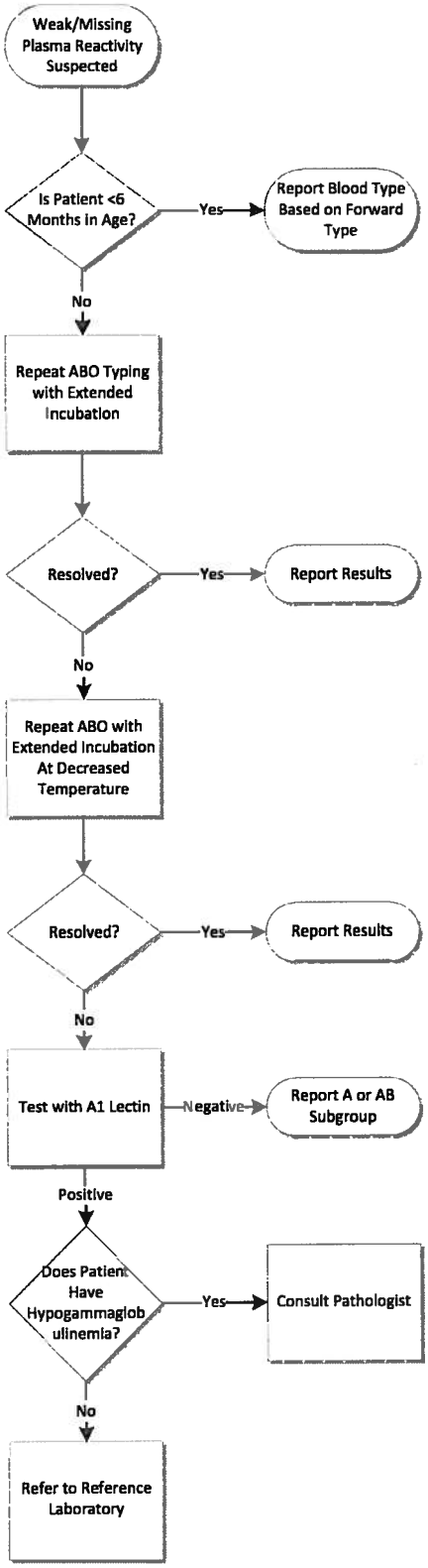
Appendix D
Extra Red Cell Reactivity Process



Appendix E
Mixed-Field Reactivity Process



Appendix F
Weak/Missing Plasma Reactivity Process



Appendix G
Extra Plasma Reactivity Process