Antibody Identification - How to Interpret Test Results

Purpose

This process describes how to identify unexpected blood group antibodies in patient plasma by testing patient plasma against a panel of red cells having different antigen characteristics. Provides guidance for additional testing that may be done to resolve antibody workups and the final interpretation of these results.

Policy

- Antibody identification must be performed and completed on patients with a positive antibody screen prior to RBC transfusion.
  - An emergency waiver may be obtained if the provider determines that the transfusion must not be delayed due to the patient's clinical condition.
- All clinically significant antibodies resulted in Cerner will only allow AHG crossmatch of units that are negative for the offending antigen. Staff must not routinely override this safety measure.
  - An exception may be made for low frequency antibodies in which sera for Antigen typing is not available (e.g. Colton, Diego, Dombrock, or Cartwright systems.)
    - In cases such as these the patient's sera is used to "screen" the units for the antigen via the AHG crossmatch.
- All new clinically significant antibodies detected must be evaluated for the possibility of a delayed transfusion reaction.
  - If the patient was transfused with red blood cells containing components in the past 24 hours to 28 days, a delayed transfusion reaction must be initiated by the transfusion service.
  - Patients with anti-E must be tested for the c-antigen. If E and c negative, donor units testing negative for both E and c must be selected for transfusion.
  - Patients with anti-C must be tested for the e-antigen. If C and e negative, donor units testing negative for both C and e must be selected for transfusion.
- Antibody identification of Anti-D must be investigated to determine if Anti-D was passively or actively acquired. Refer to Attachment D.
- It is not necessary to call the ordering provider with antibody test results, but this information may be important if it would result in a delay of providing compatible units.
- It is acceptable to add a Type and Screen order to the Antibody ID Medical Center order without a provider order, as this reconfirms the patient ABO/Rh type and the prior antibody screen results.
- It is acceptable to add DAT, Rh Phenotype and/or Antigen test order(s) to the Antibody ID Medical Center order.

Antibody Identification - How to Interpret Test Results, continued

- Crossmatch methodologies recommended by the performing Immunohematology Reference Laboratory (IRL) will be followed for complex cases (i.e. warm auto-antibodies, low frequency antibodies, etc.)
- Prior to performing a prewarmed crossmatch the sample must have suspected cold antibodies confirmed by either the IRL or by testing as described in Section F.
- It is not acceptable to retest positive screening cells (i.e. gel) by a less sensitive methodology (i.e. tube) and result out a negative result.

Definitions

Refer to the definitions below.

Word or Phrase	Definition
Homozygous	When identical alleles for a given locus are present on both chromosomes, the person is homozygous for the particular allele. For example, if the person's RBC type E+e-, that person is considered homozygous for the E antigen.
Heterozygous	When different alleles are present at a particular locus the person is heterozygous for that antigen. For example, if a person's RBC type as E+ e+, that person is considered heterozygous for the E and the e antigens.
Dosage	The quantity of antigen expressed on red cells is usually stronger in persons considered homozygous for an antigen. Some antibodies will only react with cells from donors who are homozygous for antigens and not with cells from some donors whose cells are heterozygous for that same antigen. For example. an anti-E would show "dosage effect" if it reacts with E+e- RBCs and not E+e+ RBCs.
Clinically Significant Antibody	A blood group antibody is considered clinically significant if it can cause either a hemolytic transfusion reaction (HTR) or hemolytic disease of the newborn (HDFN). Most are IgG antibodies rather than IgM. See Attachment C.
Passively Acquired Antibodies	Passive blood group antibodies are acquired from immunization (e.g. Anti-D formed from Rhogam administration) or another source such as donor plasma, passenger lymphocytes in transplanted organs, or hematopoietic progenitor cells (HPCs).
Naturally Acquired Antibodies	Naturally acquired blood group antibodies are produced by the patient's immune system following a sensitizing event such as pregnancy, transfusion, needle sharing or injections of immunogenic materials.

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Antibody Identification - How to Interpret Test Results, continued

Process Follow the steps below to evaluate and interpret patient result for antibody identification.

Section	Topic
A	Order Pathways
B	Identifying Antibody Specificity-No previously identified antibody.
C	Testing patient with previously identified antibodies
D	Evaluation of Results
E	Additional Routine Testing
F	Special Testing
G	Sending out to Immunohematology Reference Laboratory (IRL)
H	Resulting in Cerner

Process **SECTION A: Order Pathways**

Step	Action
1	Antibody ID orders may be generated in two ways: • Automatic reflex order by Cerner system when the Antibody Screen result is positive • Rarely an Antibody ID may be ordered in case of ABO discrepancy (e.g. patient with A subgroup has Anti-A1) • Provider orders placed in Health Connect for "Antibody ID Medical Center" (indicates that 4 EDTA tubes are to be collected) o Requested by Medical Center Transfusion Service usually because of inadequate sample volume to run complete Antibody ID Testing o Requested by Kaiser Regional Reference Laboratory (RRL) when unable to assign antibody identification and subsequently perform an antibody titer on prenatal samples.

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Antibody Identification - How to Interpret Test Results, continued

Process con't

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>2</td><td>When receiving "Antibody ID Medical Center" samples evaluate the patient.
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Order is a Medical Center request</td><td>• Evaluate if a Type and Screen is required to be added onto the order
• Completed Antibody ID workup (run panel, other tests as indicated and/or send samples out to IRL.)</td></tr>
<tr><td>Order is RRL Request for a Prenatal patient</td><td>Perform a Type and Screen (add onto the order)
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Ab screen is positive</td><td>Send to IRL with instructions "Please titer any clinically significant antibodies identified"</td></tr>
<tr><td>Ab screen is negative</td><td>Cancel the "Antibody ID Medical Center" order (Lab Request-comment test not indicated)</td></tr>
</table></td></tr>
</table></td></tr>
<tr><td>3</td><td>See Section H for resulting in Cerner.</td></tr>
</table>

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Antibody Identification - How to Interpret Test Results, continued

SECTION B: Identifying Antibody Specificity-No previously identified antibody

Process

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>The primary methodology of antibody panel testing used is Ortho ID-Micro Typing Systems Gel Card column agglutination test method, preferably automated.

Label the column on the panel sheet for results to indicate what media is used and what phase of testing is being performed, i.e. gel AHG, PeG-AHG, or LISS RT etc.
•Perform the initial panel.
• Always run the auto control
• If automated method is used, transcribe the results onto the panel sheet (Antigram).
o For non-automated testing grade reaction and record results on the panel sheet.
o If validated software is in use to transcribe panel results and assist in the identification of antibodies, see applicable procedure.

<u>Note:</u> Using the same methodology for both screening cell testing and panel testing assures that testing sensitivity is equivalent.</td></tr>
<tr><td>2</td><td>Exclude (rule out) antibodies:
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>No reactive (positive) cells</td><td>No further testing is indicated.
• An AHG crossmatch will be required whenever the current antibody screen result is positive.
• Result the Antibody ID in Cerner as “Wk/inconclusive”
Do not go to step 3 below.</td></tr>
<tr><td>All cells reactive (positive)</td><td>Further testing may be indicated.
• Refer to Attachments A and B.</td></tr>
<tr><td>A mixture of positive and negative reactivity is seen</td><td>
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Autocontrol Positive</td><td>Perform DAT and refer to Attachment B</td></tr>
<tr><td>Autocontrol Negative</td><td>Go to Step 3</td></tr>
</table>
</td></tr>
</table>
</td></tr>
</table>

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Antibody Identification - How to Interpret Test Results, continued

Process-con't

Step	Action
3	On the top of the appropriate panel cell antigram, cross-out the antigens for which that cell is positive – ***use homozygous cells for the Antigens which show dosage-refer to step 4 exclusion rules table.***

- Repeat for each negative cell on the panel.
- Circle or highlight the remaining specificities that cannot be excluded.
- Include the screening cells as excluding (ruling out) specificities.
- You may test additional panels or selected cells to rule out remaining specificities. See Step 5 below.

Cell	~~D~~	C	~~E~~	~~c~~	~~e~~	~~K~~	~~k~~	~~Jka~~	~~Jkb~~	Gel AHG Rxtn
1	+	+	**0**	**0**	+	**0**	+	+	+	**2+**
2	+	**0**	+	+	**0**	**0**	+	**0**	+	**0**
3	**0**	**0**	**0**	+	+	+	+	+	+	**0**
4	**0**	**0**	**0**	+	+	+	+	+	**0**	**0**

Cell 2 rules out Anti-D, Anti-E, Anti-c, Anti-k, Anti-Jkb
Cell 3 rules out Anti-c, Anti-e
Cell 4 rules out Anti-e, Anti-Jka
Cell 3 or 4 rules out Anti-K (see Step 4 below)

The following possible antibodies must be excluded (ruled out) routinely for all antibody ID workups reported with specificity.
D, C, E, c, e, K, Fya, Fyb, Jka, Jkb, S, and s

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Antibody Identification - How to Interpret Test Results, continued

Process con't

Step	Action
4	**Exclusion Rules-(Autocontrol Negative)** ***The following possible antibodies must be excluded (ruled out) routinely for all antibody ID workups reported with specificity:*** D, C, E, c, e, K, Fya, Fyb, Jka, Jkb, S, and s

To rule out antibodies to the antigen(s) listed	Follow the rule(s) below
Antibodies to **C*, c**, E*, e**, M, N, S, s, Fya, Fyb, Jka, Jkb**	A minimum of *one non-reactive* ***homozygous*** cell must be used. (e.g. Jka+/Jkb cell will rule out Anti-Jka specificity)
Antibodies to **K, P1, Lea, Leb**	A minimum of ***one non-reactive*** cell can be used without regard to dosage.

* Rule out of **anti-C** or **anti-E in the presence of anti-D**

IF	THEN
anti-D is passively acquired (i.e. Rhogam administration)	A minimum of ***one non-reactive heterozygous*** cell must be used. (r'r or r"r)
anti-D is naturally acquired (i.e. Rh negative patient transfused with Rh positive RBCs)	A minimum of ***two non-reactive heterozygous*** cell must be used. (r'r or r"r)

** Rule out of **anti-C or anti-E in the presence of anti-e or anti-c respectively**

IF	THEN
anti-c is identified	Exclude anti-E with a minimum of ***two non-reactive heterozygous*** cells
anti-e is identified	Exclude anti-C with a minimum of ***two non-reactive heterozygous*** cells

Exclusion of antibodies to **f, k, P1, Lea, Leb, Xga, Kpa, Kpb, Jsa, Jsb, Wra, Cob, V, Cw, Lua, Lub** is not routinely required

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Antibody Identification - How to Interpret Test Results, continued

Process con't

Step	Action
5	**Confirmation of an antibody specificity** • After rule outs are completed as described in step 4 a specificity may be assigned. • A minimum of 2 antigen positive cells must be reactive and 2 antigen negative cells must be nonreactive before assigning an antibody specificity. • **May Include the screening cells to confirm specificities**
6	**Additional panels or selected cell panel (partial panels)** It may be necessary to test additional panels (i.e. Ortho Panel B) or selected panel cells to exclude (rule out) or confirm (rule in) antigen specificity. • It is acceptable to use expired panel cells to perform selected cells testing, as long as a positive and negative reaction is observed for the expired lot used. o The same donor (donor number) may be present on differing lot numbers of panels. Confirm that selected cells are from unique donors (not already tested with the in dated panel cells).

Process

SECTION C: Testing patient with previously identified antibodies

Step	Action
1	If the antibody(ies) were identified previously and the antibody screen is currently positive. • Select enough additional antigen negative cells for the identified antibodies to rule out the possibility of additional clinically significant antibodies following the exclusion rules in Section B • Confirmation of an antibody specificity can be demonstrated by testing 1- positive cell for each previously identified antibody (Modified inclusion rule)
2	Refer to *Antibody Identification: How Often to Repeat* SOP for additional information.

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Antibody Identification - How to Interpret Test Results, continued

Process **SECTION D: Evaluation of Results**

Step	Action
1	Overview of screening cells/panel test results and patient history: Check patient history for the following: • The **transfusion history** of the patient • The **antibody history** of the patient • The **RBC phenotype** of the patient • Recent **administration of Rh immune globulin** • **Medications** (IVIG, Daratumumab) • Patient **diagnosis** (i.e. Multiple Myeloma, Sickle Cell Disease, Organ or marrow/stem cell transplantation) • **Current and/or past pregnancies** etc.) • Patient **ethnicity** Evaluate screening cells/panel test results: • **Auto control** reactivity • **Strength** of reactions • **Pattern** of reactivity • **Variations in the strength** of reactions o Could indicate multiple antibodies or dosing antibodies • **Reactions graded as hemolytic** Refer to attachments at for evaluation of results: ATTACHMENT A: Antibody Identification; determining specificity: **Negative auto control** ATTACHMENT B: Antibody Identification; determining specificity: **Positive auto control**

Continued on next page

Antibody Identification - How to Interpret Test Results, continued

Process **SECTION E: Additional Routine Testing**

Step	Action
1	**Antigen Typing of Patient:** If the patient has **not** been transfused with red blood cell containing products in the previous 3 months: • Test the patient's red cells for the antigen corresponding to the antibody system(s) identified using commercial antisera according to manufacturer's directions. o Molecular typing may be indicated on patients transfused within the past 3 months (Submit sample to the Immunohematology Reference Laboratory (IRL)). **NOTE:** Recent transfusions and/or a positive direct antiglobulin test will invalidate most serologic antigen typing. If the patient's red blood cells possess the antigen tested, it is unlikely that the corresponding antibody is present, unless the autologous control, in addition to reagent panel red blood cells, is agglutinated.
2	**DAT:** If the auto control is positive • Order and perform DAT test using same specimen/accession number for the Antibody ID testing. • Refer to Attachment B.

Continued on next page

Antibody Identification - How to Interpret Test Results, continued

SECTION F: Special Testing

Process

Step	Action
1	**<u>"Mini-cold" panel:</u>** May be performed to determine if patients who exhibit panagglutination with a negative or positive autocontrol can be resulted out as "Cold Agglutinin" rather than "Panagglutinin". See table below. If screening cells are positive, the cold agglutinins are confirmed, and the antibody interpretation can be resulted as "Cold Agglutinin".

Step	Action
1	Label 3 tubes with patient identifier and • AC (Autocontrol) • I (Screening cell I) • II(Screening cell I)
2	Add 2 drops of patient plasma and 1 drop of cells indicated in labeled tube (wash patient cells).
3	Gently mix the tubes and place in 4C (+/-2C) refrigerator for 15-30 minutes.
4	Spin in calibrated serofuge and read. Record results on panel sheet.

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Antibody Identification - How to Interpret Test Results, continued

Process

Step	Action
2	**Media replacement:** Patients may exhibit false positive results due to antibodies against the media components of the preservative solution in which the reagent screening and panel cells are suspended. By replacing the media using the following steps these false positive reactions can be identified and reported out as negative. **Step 1:** Pipette 200 uL of the selected 0.8% Selectogen antibody detection cells into a properly labeled 12x75 mm test tube. **Step 2:** Add approximately 500 uL of MTS Diluent 2. **Step 3:** Centrifuge for 1 minute at 3400 RPM. **Step 4:** Decant the supernatant, making sure not to disturb the cell button **Step 5:** Add 200 uL of MTS Diluent 2 and mix well. **Step 6:** Use manual gel technique, test the patient's plasma with the reagent red blood screening cells which are now suspended in MTS Diluent 2. Negative screening cell reactions: Patient has antibody against media components. May result out antibody screen result as negative. • Add "Media Replacement technique" in Result Notes • Add "Media Replacement technique" in Blood Bank comments (PPI) Positive screening cell reaction: Continue antibody workup. Patient is is most likely **NOT** exhibiting antibody against the media components Consider allo or autoantibodies or Rouleaux. • Refer to *Saline Replacement: How to Perform* for determining if patient is exhibiting Rouleaux.

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Antibody Identification - How to Interpret Test Results, continued

Process **SECTION G: Sending out to Immunohematology Reference Laboratory (IRL)**

Step	Action
1	Obtain IRL specific form or complete online form for submitting specimens for Antibody ID.
2	Complete form (written or online), do not leave any fields blank for the following: • Patient identifiers • Clinical Diagnosis • Laboratory findings (previous antibodies detected, Hgb/Hct etc.) • Transfusion History • Pregnancy History • Medications
3	Request applicable testing such as: • Antibody Identification • Titer • DAT/Elution • ABO Discrepancy • RBC Phenotyping/Genotyping
4	Request any additional special testing or products • All prenatal testing requires a titer for any clinically significant antibodies detected by the IRL o Add statement "Please titer any clinically significant antibody detected" • Any special product needs such as HbS negative or irradiated. • Antigen negative products o As applicable for patients with auto-antibodies or Sickle Cell Disease/Thalassemia o As applicable for patients undergoing Anti-CD38 or similar therapy.
5	Provide copies of blood bank test results and panels, if available.
6	Package sample(s) and inform courier per local protocol.

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Antibody Identification - How to Interpret Test Results, continued

Process **SECTION H: Resulting in Cerner**

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>For testing completed at Medical Center or by IRL
Select Antibody ID result from drop down menu in Cerner. (Refer to Attachment C)
<table>
<tr><th>IF
the following
is identified</th><th>AND
Patient Ag
typing is</th><th>THEN
add Transfusion
Requirement</th></tr>
<tr><td>Anti-E</td><td>Little c neg</td><td>Give little c neg</td></tr>
<tr><td>Anti-C</td><td>Little e neg</td><td>Give little e neg</td></tr>
<tr><td>Anti-e</td><td>C neg</td><td>Give C neg</td></tr>
<tr><td>Anti-c</td><td>E neg</td><td>Give E neg</td></tr>
</table></td></tr>
<tr><td>2</td><td>For Antibody ID testing completed at IRL
Add canned comment “ABID RL”</td></tr>
<tr><td>3</td><td>If Antibody ID testing is performed on a prenatal patient, add comment for provider to order any subsequent prenatal testing as “Antibody ID Medical Center”
This ensures that subsequent samples will be sent for additional Antibody identification and/or titer studies in the IRL rather than the KP RRL.</td></tr>
<tr><td>4</td><td>Submit paper report for scanning into Media Tab of Health Connect.</td></tr>
</table>

Non-Controlled Documents The following non-controlled documents support this procedure.

- AABB Standards, current ed.
- AABB Standards for Immunohematology Reference Laboratories, 10th ed.
- CAP Requirements, checklist, current ed.
- Fung, Mark K. Ed. Technical Manual, 19th Ed. AABB, 2017
- Judd, WJ, Johnson S, Storry J. Judd’s methods in Immunohematology. 3rd ed. Bethesda, MD: AABB Press, 2008
- Moulds, M, Kowalski, M. Guidelines for Antibody Identification. Bethesda, MD: AABB Press, 2010

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Antibody Identification - How to Interpret Test Results, continued

Controlled Documents

The following controlled documents support this procedure.

- Delayed Transfusion Reaction: How To Investigate And Report
- Result Entry: Resulting Routine Tests and Products in Cerner
- Antibody Identification: How Often to Repeat
- Saline Replacement: How to Perform
- Management of Patients on Anti-CD38 Therapy
- ATTACHMENT A-Antibody Identification; determining specificity Negative auto control
- ATTACHMENT B-Antibody Identification; determining specificity Positive auto control
- ATTACHMENT C-Cerner final interpretation
- ATTACHMENT D-Rhogam Workflow

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Antibody Identification - How to Interpret Test Results, continued

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Change type: new, major, minor etc.	Changes Made to Document – Describe	Signature responsible person/Date	Med. Dir. Reviewed/ Date	Lab Manager reviewed/ Date	Date change Imp.
New					
V .01	Correct the error on policy, to match the process, to send comment to MD not call.	Ginny Tyler	N.A.	N.A.	
V.02	Replaced serum with plasma in most cases except for finding hemolysis.	Ginny Tyler 07/07/11	N.A.	N.A.	

IMP = Implemented

MasterControl History of Change:		
Change type: new, major, minor etc.	**Version #**	**Description of Change**
Major	4	• Policy on sending comments to HC • Reformatted • Better defined what a weak indeterminate result is and when to send to Reference Lab. • Added how to record coombs check cells. • Added how to label panel with media and phase of testing.
Major	5	• Added policy and flowchart regarding Anti-D investigation and interpretation. • Added policy allowing testing of DAT and/or Patient Ag typing if indicated to be initiated without obtaining a provider order. • Modified step 4 in section 3. Removed option to test possible warm antibody workups with diluted plasma. Removed this option from Attachment E. • Added steps 3 and 4 in resulting antibodies section. • Updated uncontrolled document reference. • Added identifiers to Attachments A-E.
Major	6	• Revised entire document and attachments for clarity, added several Sections to address entire process from provider order to result entry.

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Antibody Identification - How to Interpret Test Results, continued

ATTACHMENT A Page 1

Antibody Identification; determining specificity **Negative auto control**:

Consult with manager or designee if not certain of result to report and/or if additional samples are required for IRL Testing.

Test Results	Possibilities	Result to report
Some Red Cells Reactive (similar strengths)	Suspect single antibody. • See Sections B, C, and D for instructions on exclusion rules, confirmation, and additional testing.	• Specified Ab (e.g Anti-K) • Consider send out to IRL if unable to rule out all clinically significant antibodies • If unable to identify antibody, result out **Wk/Inconclusive**
Some or all Red Cells Reactive (multiple strengths)	Suspect multiple antibodies or HLA antibody. • Dosage may explain multiple strengths (examine pattern of homozygous and heterozygous cells for antigens showing dosage: C/c, E/e, Fya/Fyb, Jka/Jkb, M/N, S/s)	• Specified Abs (e.g Anti-K and Anti E) • Consider send out to IRL if unable to rule out all clinically significant antibodies • If unable to identify antibody, result out **Wk/Inconclusive**
No pattern	Suspect multiple antibodies or cold agglutinin	• Consider send out to IRL for antibody ID and/or additional testing • If unable to identify antibody, result out **Wk/Inconclusive**
All Red cells reactive, may present as a "mixed field" appearance in gel	Suspect Cold Agglutinin	• Confirm presence of cold antibodies with Mini-Cold panel • May perform prewarm crossmatches once confirmed on sample • Result out **Cold Agglutinin**

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Antibody Identification - How to Interpret Test Results, continued

ATTACHMENT A Page 2

Antibody Identification; determining specificity **Negative auto control**:

Consult with manager or designee if not certain of result to report and/or if additional samples are required for IRL Testing.

Test Results	Possibilities	Result to report
All Red Cells Reactive	Suspect Anti-CD38 therapy OR Suspect antibody to high incidence antigen or High Titer Low Avidity (HTLA) antigen • Rare case: Suspect warm autoantibody with negative auto-control by gel method	• If Anti-CD38 therapy is confirmed and IRL has confirmed no underlying allo-antibodies result out **Other** with a result comment of Anti-CD38 therapy • Consider send out to IRL for antibody ID and/or additional testing • If unable to identify antibody, result out **Panagglutinin**
Some Red Cells Weakly Reactive (common antibodies ruled out)	Suspect weakly reactive antibody (low titer) OR Suspect Antibody showing dosage	• If unable to identify antibody, result out **Wk/Inconclusive**
Only One Red Cell Reactive	Suspect antibody to low incidence antigen OR Suspect antibody to HLA antigen	• If unable to identify antibody, result out **Wk/Inconclusive**

NOTE: All reactivity patterns seen above may be due to Anti-CD38 or other IgG monoclonal therapies directed against malignant cells which may interfere with Anti-IgG test systems.

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Antibody Identification - How to Interpret Test Results, continued

ATTACHMENT B-Page 1

Antibody Identification; determining specificity **Positive auto control, DAT Positive**

Test Results	Possibilities	Result to report
No Red Cells Reactive on panel	Suspect drug antibody (piperacillin, ceftriazone, cefotetan, cehpalosporins) • Rare: Suspect clinically significant antibody (bound to RBCs transfused in the past 90 days)	• Result out **Wk/Inconclusive** • Send out to IRL for antibody ID/elution studies
Some Red Cells Reactive on panel AND Patient has been transfused within 90 days	Suspect new allo-antibody OR Suspect transfusion reaction (if transfused within past 28 days)	• Result out **Wk/Inconclusive** • Send out to IRL for antibody ID/elution studies
Some Red Cells Reactive on panel AND Patient has NOT been transfused within 90 days	Suspect HTLA allo-antibody OR Suspect autoantibody with specificity.	• Result out **Wk/Inconclusive** • Consider send out to IRL for antibody ID/elution studies
All Red Cells Reactive on panel	Suspect Anti-CD38 therapy OR Suspect Auto Immune Hemolytic Anemia (AIHA) OR Suspect Cold Agglutinin • Rare: Suspect passive antibody, drug antibody, transfusion reaction to high prevalence or multiple antigens	• If Anti-CD38 therapy is confirmed and IRL has confirmed no underlying allo-antibodies result out **Other** with a result comment of Anti-CD38 therapy and to view IRL report. • Send out to IRL, report out **Warm Auto or Cold Agglutinin** if confirmed by IRL

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Antibody Identification - How to Interpret Test Results, continued

ATTACHMENT B-page 2

Antibody Identification; determining specificity **Positive auto control, DAT Negative**

Test Results	Possibilities	Result to report
No Red Cells Reactive on panel	• Non specific reactivity	• Result out **Wk/Inconclusive**
Some Red Cells Reactive on panel	• Suspect alloantibody with specificity. • Non specific reactivity	• If unable to identify antibody, result out **Wk/Inconclusive**
All Red Cells Reactive on panel	• Suspect Anti-CD38 therapy • Suspect antibody to media component-use media replacement technique	• Send out to IRL if patient on Anti-CD38 therapy • If unable to identify antibody, result out **Wk/Inconclusive**

NOTE: Elution studies on patients with positive antibody screens/panels may be informative in identifying antibody specificity even when the DAT is weakly positive or negative.

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Antibody Identification - How to Interpret Test Results, continued

ATTACHMENT C-Cerner final interpretation

The following table classifies the clinical significance of antibodies in the Cerner system.

- Antibodies that are defined as "clinically significant" in Cerner will require an AHG crossmatch with antigen negative RBCs.
- Clinically significant antibodies are highlighted in the PPI screen in Cerner.

Clinically Significant			NOT Clinically Significant	
Anti-D	Anti-S	Anti-G	Anti-M	Anti-D due to RhIg
Anti-C	Anti-little s	Anti-f	Anti-N	Anti-A1
Anti-little c	Anti-U	Anti-p	Anti-P1	Anti-A
Anti-E	Anti-Lu3	Anti-V	Anti-Lea	Anti-B
Anti-little e	Anti-Coa	Anti-Joa	Anti-Leb	Anti-H
Anti-CW	Anti-Cob	Anti-Jra	Anti-Lua	Anti-I
Anti-K	Anti-Dia	Anti-LW	Anti-Lub	Anti-i
Anti-little k	Anti-Dib	Anti-Lan	Anti-Xga	Anti-IH
Anti-Kpa	Anti-Wra	Anti-HrB	Anti-Ytb	Cold Agg
Anti-Kpb	Anti-Doa	Anti-HrS	Anti-Ch	Other Ab
Anti-Jsa	Anti-Dob	Anti-Ge	Anti-Kna	Anti-HTLA
Anti-Jsb	Anti-Gya	Anti-Goa	Anti-Yka	Warm Auto
Anti-Fya	Anti-Hy	Anti-Mia	Anti-McCa	Panagglutinin
Anti-Fyb	Anti-Yta	Anti-Sc2	Anti-JMH	Wk/Inconclusive
Anti-Fy3	Anti-Vel	Anti-Tja	Anti-Bg	Error Cor
Anti-Jka	Anti-Aua	Anti-VS	Anti-Bga	HLA
Anti-Jkb	Anti-Aub	Anti-Wka	Anti-Bgb	NT
Anti-Jk3	Anti AnWj		Anti-Bgc	Anti-Rd
			Anti-Csa	Anti-Rg
			Anti-Vw	Anti-Sc1
				Anti-Sc3
				Anti-Sda

Continued on next page

Antibody Identification - How to Interpret Test Results, continued

ATTACHMENT D-Rhogam Workflow