COMPATIBILITY TESTING (CROSSMATCH) IMMEDIATE SPIN AND COOMBS

I. PRINCIPLE

UPH-Pekin Laboratory personnel will utilize this procedure for performing crossmatches.

The immediate spin crossmatch is done only when the patient is already known to have no atypical antibodies present (negative antibody screen) and the patient does not have a history of any atypical antibodies. If the patient's antibody screen is positive or the patient has a history of a positive antibody screen the full Coombs crossmatch must be performed. The patient's history must be checked in Sun Quest (LIS) for any previous BB testing at UnityPoint Health-Pekin, Methodist, and Proctor and our old card files.

If incompatibility is seen in the immediate spin phase of the crossmatch, the full Coombs crossmatch procedure must be completed. It is desirable to determine the cause of incompatibility rather than to continue crossmatching blindly. If possible, attempts to determine the cause of incompatibility or identify an irregular antibody are done concurrently with subsequent crossmatches.

II. CLINICAL SIGNIFICANCE

The purpose of pre-transfusion testing is to select for each recipient blood products, that when transfused, will have acceptable survival and will not cause clinically significant destruction of the recipient's own red cells. AABB STANDARDS states that the following procedures must be part of the pre-transfusion compatibility testing:

A. Positive identification of recipient and blood sample.
B. Review of transfusion service records for results of previous testing from the recipient to identify any discrepancy between previous and current ABO and Rh type on file, any history of clinically significant antibodies, any previous adverse events, or any special transfusion requirements. All cases in which the ABO or Rh typing is not in accordance with the patient's laboratory historical record must be investigated, reconciled, and recorded in the Typing Discrepancies log sheet (see UPPK BB-0503.01) in the black binder on the Blood Bank counter and placed into RL Solutions if warranted.
C. ABO and Rh grouping tests.
D. Selection of blood products of appropriate ABO and Rh groups.
E. Antibody detection tests using the recipient's plasma.

F. Test combining the recipient's plasma and donor's red cells that demonstrates ABO compatibility.
G. Labeling and issue of the blood products.

III. SPECIMEN

A. Plasma from a pink top tube is to be used. The sample used for compatibility testing should be no more than three days old at the time of transfusion. (The day of sample draw is day zero.) Exception: The sample of an outpatient, for surgery, who has not been pregnant or transfused within the previous three months is good for seven days.
B. Blood specimens are stored at 2°- 8° C, if not used immediately. At the time of specimen collection, a Blood Bank arm band with patient's first and last name, birthdate, and/or medical record number should be placed on the patient's wrist (this is in addition to the hospital identification bracelet). The specimen tube should have the patient's first and last name, birthdate, and/or medical record number, Blood Bank band identification number, date, time, and initial of person who collected the blood.
C. All Blood Bank specimens that have had testing performed on them are stored for 14 days to ensure they are kept for at least 7 days after transfusion.

IV. IMMEDIATE SPIN PROCEDURE: (Negative Antibody Screen and no history of an antibody:

A. Confirm patient's specimen identity with crossmatch request.
B. Check for patient Blood Bank history in the LIS (Sunquest and Paragon) and our old card file.
C. Separate patient's plasma to a labeled and dated tube. Include the Blood Bank ID number on the pour off tube also.
D. An Indirect Coombs (antibody screen) must be negative, i.e., no atypical antibodies present and no patient history of any atypical antibodies.
E. Determine patient's ABO and Rh type. Verify with previous records if available. If there is an ABO or Rh discrepancy, record on Typing Discrepancy Form (UPPK BB-0503.01) in the black binder on the counter and enter into RL Solutions. If no ABO/Rh history, then another specimen (Pink or Lavender top) must be collected at a different time to perform a quick tube type (procedure BB-0264). Order an ABO/Rh confirmation test (ABRCNF) in Order Entry, and result in the computer before any units can be transfused.
F. Select appropriate donor blood from the blood bank refrigerator.
G. Wash a sample of donor cells from an intact segment with Isotonic saline in a tube, labeled with the donor number, for 1 minute. Decant saline after washing and prepare a 2-4% cell suspension with Isotonic saline. (Compare cell suspension to reference reagent red blood cells.)

H. Determine donor ABO and Rh type (if not already rechecked) and attach a pink ABO and Rh confirmation label with date and your initials to the unit. Most of our units will already be rechecked since retyping of donor units is to be performed and put into Sun Quest (LIS) when we receive them from ARC. The only exception to this will be if units just received are the ones to be crossmatched.
I. Place 1 drop of donor cell suspension in 12 x 75 mm tube labeled with donor number and first and last initial of patient being tested. (Lengthen the minimum letters to differentiate patients with the same initials, if necessary.)
J. Add 2 drops of patient's plasma to each tube. Shake gently to mix.
K. Centrifuge for 20 seconds at 100 rct or at the optimum calibrated time for the centrifuge.
L. Gently re-suspend cells and examine macroscopically for agglutination or hemolysis (see recommended grading system on Blood Bank bulletin board).
M. If no agglutination or hemolysis is noted, the unit(s) are compatible and may be given.
N. If the unit(s) was compatible, cut off 2 more intact segments from the unit and place a small unit number label from the back of the bag around each segment. Then place a small patient label around both segments. Make sure all labels are attached securely. Place labeled segments in the correct storage container compartment for that day of the week in the Blood Bank refrigerator and save for 14 days.
O. Cap the specimens and place in the Blood Bank refrigerator.

V. COMPLETE COOMBS PROCEDURE (Antibody present or patient history of an antibody):

Note: Antigen type all donor units for antibodies identified or by known history (see appropriate antigen typing procedure). It is not necessary to antigen type for IgM antibodies (these are detected at room temp) which include P_1, Lewis (Le-a and Le-b), and M. For Anti-A_1 Coombs crossmatch type O units. If proper anti-serum is not available, notify Red Cross to obtain antigen negative units.

A. Complete Immediate Spin Crossmatch (see above)
B. Add two drops of LISS to each tube. Shake gently to mix.
C. Incubate tubes at 37°C for 10 minutes (incubation may be extended to 30 minutes).
D. Centrifuge for 20 seconds (or the optimum calibrated spin time) at 3400 rpm (1000 rcf) and examine as in step K above.
E. Wash tube(s) 3 times with isotonic saline (the automatic cell washer may be used).
F. Add two drops of IgG Coombs serum and shake gently to mix.

G. Centrifuge for 20 seconds (or the optimum calibrated spin time) at 3400 rpm (1000 rcf).
H. Gently re-suspend cells and examine macro and microscopically for agglutination or hemolysis.
I. Add one drop of Coombs control cells to all tubes with negative results and centrifuge for 20 seconds (or the optimum calibrated spin time) at 3400 rpm (1000 rcf).
    1. If the cells are now agglutinated, the negative or compatible result is valid.
    2. If not, testing must be repeated.
J. Cap the specimens and place in refrigerator. Store 14 days.
K. If the unit was compatible, cut off 2 more intact segments from the unit and place a small unit number label from the back of the bag around each segment. Then place a small patient label around both segments. Make sure all labels are attached securely. Place labeled segments in the correct storage container compartment for that day of the week in the Blood Bank refrigerator and save for 14 days.

VI. INTERPRETATION:

A. Compatible: All phases that are required (immediate spin, 37° C, and IgG Coombs) are negative for agglutination and Coombs control cells, when appropriate, are agglutinated.
B. Incompatible: Positive for agglutination in any phase of testing, prior to Coombs control cells.
C. Inconclusive Coombs Phase: All phases are negative for agglutination including Coombs control cells
D. If incompatibility is seen in the early phase of a crossmatch, the procedure will be completed to give information as to the temperatures, medium, and variability of reactions with the donors. It is desirable to determine the cause of incompatibility rather than to continue crossmatching blindly. If possible, attempts to determine the cause of incompatibility or identify an irregular antibody are done concurrently with subsequent crossmatches.

VII. RECORDING/REPORTING RESULTS:

A. A PREPARE RBC order will be placed in Epic when a crossmatch is needed in addition to a patient's type and screen. Inpatient orders should also be phoned to the lab and a paper copy of the order brought to Blood Bank for the outpatient transfusions.
B. Pull up the patient's Type and Screen order in Blood Order Processing (BOP) and enter the number of units ordered on the correct line. If additional units are added on to the same type and screen, change the number of units ordered on the

line to the total number ordered. Example: If 1 more unit is ordered to a patient that already received 2 units, change the number of units ordered from a 2 to a 3. (Fill in type and screen results also if performing simultaneously with the crossmatch. See Type and Screen procedure.)

C. From the Type and Screen page in LIS, click on the Allocation tab. Then click on the green Inventory Search button to search our inventory for the proper units to crossmatch (type specific, using the units that are to outdate first, unless using special antigen typed or irradiated units).

D. Once the proper units are found, check mark the box(es) next to the unit(s) you want to allocate and crossmatch. Click SAVE and the chosen units will be added to the bottom of the Type and Screen page for crossmatch.

E. Click on the XM box next to the unit(s) that you selected, then hit the HOME key to take you to the reaction grid for the immediate spin crossmatch. Fill in the reaction grid(s) with appropriate reactions (immediately after reading tubes) and then the crossmatch interpretation(s) appropriately. (See Sun Quest keyboard chart-UPPK BB-0553.02)

F. If a coombs crossmatch is warranted the test needs to be added to the unit testing by clicking in the "add unit testing" box at the bottom of the screen, then hit the (.) key on the keyboard. Fill in coombs crossmatch grid(s) with appropriate reactions (immediately after reading tubes) and then the coombs crossmatch interpretation(s) appropriately. (See Sun Quest keyboard chart- UPPK BB-0553.02)

G. If crossmatch is determined to be compatible, put an OK with the ( ]) key in the transfusion status (TS) box.

H. After checking over all your work carefully, hit the SAVE button and unit tag(s) will print with all the proper information. Attach the printed unit tag(s) to the proper unit(s) for transfusion.

I. Result the PREPARE RBC order in BOP with the "J" key (RBC's ready for transfusion).

VIII. REFERENCES

A. AABB, Technical Manual, 19th Edition, American Association of Blood Banks, Bethesda, MD, 2017.

POLICY CREATION :	Date
Author: Sharrol Brisbin, MT	02/02/1992
Medical Director: Sheikh, MA, MD	02/02/1992

MEDICAL DIRECTOR		
DATE	NAME	SIGNATURE
11-27-18	Kathryn O. Kramer MD	
SECTION MEDICAL DIRECTOR		

REVISION HISTORY (began tracking 2011)			
Rev	Description of Change	Author	Effective Date

Reviewed by

Lead	Date	Coordinator/ Manager	Date	Medical Director	Date
Jennifer Jenner	11-29-18				