## TITLE: Cord Blood Routine

PRINCIPLE:

Rh typing, ABO group and direct antiglobulin test (Coombs test) are minimal but essential tests of the umbilical cord in suspected Erythroblastic babies. This testing can also be done on the heelstick of babies less than 4 months old.

**CLINICAL SIGNIFICANCE:**

Evaluation by laboratory tests of the umbilical cord blood in Erythroblastsis is important in deciding whether or not the baby may need exchange transfusions. The evaluation involves not only blood bank, but also hematology and biochemistry.

# PERSONNEL:

Medical Technologists

# EQUIPMENT:

See individual procedures for necessary equipment.

# COLLETION OF SAMPLE

Labor and delivery or NICU collects these samples for us, the order is placed via the EHR with the ordering provider choosing the source (cord, heelstick, venipuncture). They should send one of the following; a 6 mL red top and a 6 mL pink top, an EDTA tube (purple top) or 2 EDTA microtainer tubes. Perform appropriate testing which is ordered through the HIS. If sample is not an actual cord blood but a heelstick or venipuncture on a baby less than 4 months old, a comment should be entered that testing was done on heelstick or venipuncture.

### STEPWISE PROCEDURE

1. Aliqout off a sample from the pink top into a 10x12 test tube, check for clots. Spin down the sample for 5 minutes to pack the red cells. Label with the PLANALQ sticker that comes with the sample from LCC.
2. Perform ABO Typing.

Perform Rh typing- If no agglutination is observed proceed to the Du Testing Procedure.

1. Perform a direct antiglobulin test using IgG Coombs reagent.
2. An eluate must be prepared from direct antiglobulin positive specimens and the antibody

identified ONLY if the physician requests it. This testing would be sent to the reference laboratory of our current Blood Supplier.

1. Order a neonatal total bilirubin when the direct antiglobulin testing is positive.

**Receive** the order and take the red top cord blood sample and label to Chemistry for testing.

1. Order a H&H and reticulocyte count on the pink top tube when the direct antiglobulin testing is positive, ONLY if the pink top is not clotted. Receive the order and take the pink top and label to Hematology for testing.
2. All positive direct coombs must be called to the patient’s (baby’s) nurse. Document this call in a comment on the order. \*Request a new sample for the H&H and reticulocyte count if the pink top was clotted.
3. After testing is complete, place samples in the daily rack, allowing for 21 day storage.
4. Result testing using the Patient Test Verify option for ECHO results. Make sure to have the mother’s medical record number available for linking at the time of resulting.
5. Results can also be entered manually under Patient>Orders>Results, this is the recommended way to enter cord blood testing on babies born to a surrogate in order to bypass the linking of mom to baby.

NOTE: CORD BLOOD TESTING **MUST** BE COMPLETED WITHIN 6 HOURS OF THE BABY BEING BORN. In an effort to save resources when one cord blood is received the pending may be reviewed for any other pending cord bloods. You may wait for the other pending cord bloods before testing or you may call the floor requesting them to send down the pending cord blood. Never “batch test” cord bloods on your shift.

**INTERPRETATION**

1. In newborn infants, only cell grouping is done, as the expected Anti-A and/or Anti-B does not usually appear until infants are about 3 to 6 months of age.
2. Identification of the antibody in maternal serum may confirm the identity of the antibody eluted from the infant’s cord blood cells.
3. Specimens, which are direct antiglobulin positive, may also indicate antibodies other than Rh (D), or fetal-maternal ABO incompatibility.
4. The strength of positive direct antiglobulin test does not indicate the severity of the disease process. Hemoglobin, indirect serum bilirubin level, and reticulocyte count are better reflectors of the extent of red cell destruction and elimination.
5. Umbilical cord specimens contaminated with Wharton’s jelly must be washed four or more times with saline.

**NOTE: You may add an antibody screen to cord blood testing that has been drawn by heelstick or venipuncture; if requested by a physician or if needed when no maternal testing has been done.**

**CALCULATIONS**

Not applicable

**REPORTING RESULTS**

Report all results through the Laboratory Information System.

**NOTE**: Positive weak D test results are valid only if it can be shown that red blood cells produce negative results in Direct Antiglobulin Testing (Anti-D product insert). When the DAT is positive and the Weak D is positive; Weak D results are invalid. Please reference the following table when resulting out RH typing on cord bloods:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **DAT** | **Rh** | **Mono Ctrl** | **Weak D** | **Weak D Ctrl** | **RESULT** |
| NEG | NEG | NEG | NEG | POS | **Rh negative** |
| POS | NEG | NEG | NEG | NEG | **Rh negative** |
| POS | NEG | NEG | POS | POS | **Rh INV** |
| NEG | POS | NEG | NT | NT | **Rh positive** |
| POS | POS | NEG | NT | NT | **Rh positive** |

When your Rh is invalid please add a comment stating: “The DAT is positive, weak D results are invalid due to the high probability of a false positive”

If the mother is RH negative in this scenario she would be a candidate for Rhogam.

If the weak D is negative specimen can be resulted as usual.

**REFERENCE:**

Technical Methods and Procedures of the Association of Blood Banks

Soft Computer, Clearwater, Florida

Immucor Anti-D package insert