

PROTOCOL #30 - Maternal Fetal Medicine, University of New Mexico

**PERCUTANEOUS UMBILICAL BLOOD SAMPLING (PUBS)**

Percutaneous umbilical blood sampling (PUBS) utilizes a narrow-gauge needle that is guided transabdominally into the umbilical vein under ultrasound guidance. Indications for PUBS include: precise evaluation of iso-immune hemolytic anemia, fetal blood typing and antibody testing, assessment of fetal acid-base status, determination of possible fetal infection, evaluation of fetal clotting disorders, and fetal intravascular transfusion.

When a PUBS is scheduled, a PUBS Request Form should be completed by the evaluating physician and circulated to the following personnel:

1. Dr. Valerie Rappaport (272-6611)
2. Charge nurse in MFM Clinic (272-2319). This nurse will act as liaison with physician, L&D, and patient.
3. Day charge nurse - Labor and Delivery (272-2603). The Day charge nurse will schedule procedure and assign staff nurse as appropriate.
4. Phyllis Schubert in Hematology (272-8628 or 272-9216). Off-hours supervisor is Virginia Nymeyer (same phone number).
5. Kathy Zurek-Day supervisor and Virginia Nymeyer-Evening supervisor in Blood Bank, (272-2592) if transfusion is anticipated.

Procedure:

1. Informed consent stressing known and possible risk will be obtained by physician prior to start of procedure.
2. Hemograms, type and screen on day before (label has to read **FOR PUBS**).
3. Patient is to be admitted to L&D (L/D Room E), two hours before scheduled procedure. She is to be NPO six hours prior to scheduled procedure.
4. A peripheral IV should be started on admission. Either DSLR or LR may be used.
5. Electronic fetal monitor tracing will be obtained at the discretion of the perinatologist.
6. Abdominal ultrasound is obtained prior to beginning of procedure to confirm EGA, EFW, and exclude fetal anomalies. A 5 or 3.5 mHz transducer is used to locate umbilical cord insertion site on the placenta.
7. Prior to start of procedure, the maternal abdomen is prepped, with Betadine. Staff is to wear scrubs, surgical hat, gloves, masks and gown.
8. After abdomen is prepped, ultrasound transducer is covered with sterile sheath.
9. Patient is medicated on order of Perinate. Local anesthetic is injected at needle insertion site.
10. Using a 22-gauge (12.7 cm -17.0 cm) spinal needle, the umbilical vein is punctured approximately 1-2 cm from the placental insertion site.
11. After the needle tip is inserted in the vessel's lumen, 2 cc normal saline solution is injected into the vessel to demonstrate typical picture of intravascular turbulence.

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12. Once assured needle tip is in vessel lumen; the following will be drawn and sent to the lab either separately or together:
  - a. PUBS #1 - 1 cc heparinized TB syringe. This will be walked through STAT to hematology for RBCI with MCV, hemoglobin hematocrit and reticulocytes. If indicated, an ABO/Rh and direct Coombs should also be run from this specimen. If the fetus has been transfused at a previous date, a fetal histogram should be performed and compared with maternal histogram. If the hematocrit in this sample is more than 25% there is no need to wait for the results of PUBS #2. In cases where transfusion is anticipated, a small amount of the specimen will be analyzed in the hemocue system.
  - b. PUBS #2 - 1 cc heparinized STAT. Fetal blood gases.
  - c. PUBS #3 - if indicated, two 1 cc heparinized TB syringes for Cytogenetics (also referred to as karyotype with chromosomes). Do not refrigerate! KB stain will be run from aliquot obtained from this specimen. Amniotic fluid should be sent as a back up for cytogenetics.
  - d. PUBS #4 - 1 cc heparinized TB syringe for storage.
  - e. Additional tests such as drug levels, Igm and IgG CMV, toxoplasmosis or parvo virus may be performed if indicated.
14. Amniotic fluid will be drawn (when indicated) and sent for possible karyotype, Delta OD, L/S, and PG. 1 tube should be covered with aluminum foil.
15. Fetal transfusion is recommended if the fetal HCT is below 25%. Blood should be warmed to body temperature. If IVT is indicated, the fetus is paralyzed with Pavulon 0.2 mg/kg.
16. Blood is to be transfused at rate of 1 cc to 3 cc per minute.
17. A post-transfusion HCT will be drawn and sent to lab six minutes after finishing the transfusion. Results will be called STAT to determine whether fetus requires additional blood.
18. Doppler flow studies will be done on umbilical cord before, during and after procedure.
19. A 1-2 hour electronic fetal monitor tracing must be obtained after procedure. It should be remembered that fetal bradycardia or periodic decelerations are a sign of fluid overload.
20. PUBS may be repeated at 1-4 weeks intervals depending on indication and status of fetus.
21. 300 micrograms Immune Globulin should be given for those patients with negative Rh and AST.
22. All drugs and fluids on field must be clearly labeled and identified.
23. A copy of the PUBS Request Form should be placed in the L&D PUBS notebook and a data collection form filled out and given to entry personnel in the Division of Maternal-Fetal Medicine.

**CONSULTATION:** Twenty-Four hour consultation is available by calling the Maternal Fetal Medicine service at the University of New Mexico Hospital, 1-888-866-7257.