

Percutaneous Umbilical Blood Sampling Fetal Blood Transfusions

PREPARATION

Scheduling secretary

- Patient must have a Maine Medical Center blue card.
- Patient must remain NPO (nothing to eat or drink after midnight) for 8-12 hours prior to the procedure.

Nurse

- The following lab work must be completed on the patient using the following time guidelines.
 1. Type and screen
 2. CBC with differential
- Time guidelines
 1. **AM** procedure- patient needs to be in the blood bank 1½ to 2 hours prior to the procedure.
 2. **PM** procedure- patient needs to be in the blood bank prior to 9:00 am.
- An order is to be submitted to the blood bank (located in the sub-basement of the hospital) for preparation of the potentially transfusable blood. This must be ordered in cc's. In order to pick up the blood that is to be transfused, you must have the patient's blue card with you along with the following information written on a piece of paper:
 1. Patient name
 2. Date of birth
 3. Blue card number
 4. Amount of blood requested.
- Verify that the information on the tags attached to the syringes matches the information on the paperwork sent with the syringe and sign on the appropriate line on the paper attached to the blood (verifier should be different than transfuser). A copy of the blood bank protocol will follow. Blood Bank phone number is 871-2121.
- The following departments should be notified of the procedure at the time that it is scheduled.
 1. Labor and Delivery 662-2589
 2. Neonatal Intensive Care Unit 662-2246
- Verify just prior to the procedure with the charge nurse on duty the cesarean section room is available and that it is not a problem to proceed with the procedure.

Labor and delivery

- A copy of the Labor and Delivery (L/D) protocol will follow
- The patient should arrive at L/D 1-1½ hours prior to her appointment for monitoring, placement of heparin lock and to be changed into a hospital gown.
- Anesthesia may want to consult with the patient-L/D will notify them of the patient's arrival.

Physician

- The patient should be counseled about the following:
 1. Consent form (must be signed by the patient and witnessed), an example of the consent form will follow.
 2. Possible cesarean section.

Sonographer

- The examination table should be placed outside the ultrasound room door (not to obstruct path of a stretcher leaving the room) and replaced with a stretcher for the procedure.
- Ultrasound examination:
 1. A complete examination should be performed if not yet done.
 2. If a complete examination has been performed within the last week documentation should include:
 - ✓ Placental cord insertion site
 - ✓ Fetal position
 - ✓ Placental texture
 - ✓ Transverse abdomen
 - ✓ Sagittal abdomen
 - ✓ Largest fluid pocket with measurements
 - ✓ M-mode
 - ✓ Liver length
 - ✓ Estimated fetal weight
 - ✓ Locate placental umbilical cord insertion site and review this with the physician performing the examination.
- Open all supplies needed and place on the procedure tray. This will be double-checked and flushed with heparin by the assistant/nurse team just prior to the procedure.

Potential blood samples

Tubes to be used:	NICU baby tubes
Purple top (half filled)	CBC
Purple top (filled)	Hemoglobin electrophoresis
Purple top	Pre-transfusion HCT Post-transfusion HCT

Red top (half filled)
(4 ml's minimum) Type and Screen
Toxo and parvo

Green top Chromosomes

Black top (twist) Pulmonary indices

- All blood samples except the type and screen are taken to the central processing area in the laboratory. The type and screen are taken to the blood bank (located in the sub-basement of the hospital).

Lab slips

Separate forms are used for maternal and fetal blood samples.

- If maternal blood is drawn
 1. Write **MATERNAL BLOOD** in the space marked "description"
 2. The label on the tube itself should include:
 - ✓ Patient name
 - ✓ Date of birth
 - ✓ Blue card number
 - ✓ Sample time
 - ✓ Sample date
 - ✓ MATERNAL BLOOD
 - ✓ Gestational age
 - ✓ Diagnosis
- If fetal blood is drawn
 1. Write **FETAL BLOOD** in the space marked "description"
 2. Patient's name will be **FETUS: Maternal name** (i.e. Fetus: Jane Doe)
 3. The label on the tube should include:
 - ✓ Patient name (**FETUS: Maternal name**)
 - ✓ Maternal blue card number
 - ✓ Sample time
 - ✓ Sample date
 - ✓ Gestational age
 - ✓ "pre-transfusion" or "post-transfusion" depending on sample **FETAL BLOOD**
 4. Tests to be ordered
 - a. CBC
 - b. Type and screen
 - c. If indicated:
 - Toxo and parvo titers
 - Hemoglobin electrophoresis
 - Chromosomes (should be sent to Genzyme)

Supplies

1. Hemocue machine and cuvettes
2. Sterile gown for physician performing the procedure (from L/D)
3. Hats and masks for all clinical staff as well as the patient support person in the room.
4. 2-anesthesia extension sets
5. 10-3 cc IM syringes for fetal blood drawing
6. 1-5 cc syringe for lidocaine
7. 1-10 cc syringe for potential amniotic fluid to be drawn
8. 1-1 cc 25G 5/8 tuberculin syringe for pancuronium
9. Sterile ultrasound probe cover
10. Spinal needle 5 and 7 inch (size dependent on physician preference)
11. Sterile gloves-size 7 for physician
12. Sterile gloves-size 7 for sonographer (only needs to be worn on scanning hand)
13. Sterile drapes
14. Betadine
15. Sterile gauze soaked with betadine to wipe patient's skin
16. Heparin
17. Lidocaine
18. Normal saline

PROCEDURE

Personal protective wear should be used according to policies established under infection control section.

Nurse

- Prepare the hemocue for the initial HCT and the post-transfusion HCT
- A fetal hemoglobin should be done at the beginning of the procedure and after the transfusion using the hemocue
- Prepare the pre and post transfusion (HCT) purple tops, the following are for a transfusion:
 1. Flush the extension with the "t" tubing with normal saline so that there are no air bubbles.
 2. Verification of the blood to be transfused-must be signed and witnessed.
 3. Determine amount of blood to be transfused by using the following formula:
$$\frac{(100\text{cc/kg}) \times (45\text{-initial HCT})}{70}$$
$$(\text{HGB} \times 3 = \text{HCT})$$
 4. Have the plunger with a syringe of blood to be transfused in it attached to the extension tubing and available for the transfusion process. When the blood is being transfused and incredible amount of resistance should be and will be met upon pushing. Have an IV set ups and hanging from an IV

pole (bag of saline with the tubing inserted and saline run through the tubing to eliminate air bubbles).

Sonographer

- Localize placental cord insertion site and provide needle guidance for the physician (this may entail following the needle and/or the cord).
- Once the needle is in the cord intermittently check fetal heart activity with the Doppler if it is not possible to visualize cardiac activity while providing guidance.

Post procedure

Disposal of syringes from the blood bank-

- If the syringe is empty it may be disposed of in a needle/syringe disposal container.
- If there is blood remaining in the syringe it must be sent back to the blood bank.
- A copy of the paperwork that comes with each syringe should be kept for the patient chart and the remainder sent back to the blood bank.

Sonographer

- Spewing of blood may be identified upon removal of the needle from the cord-the physician performing the procedure may ask for this to be watched until it ceases (note the duration it lasts).
- A brief examination to review fetal status.
- Watch cardiac activity for approximately 10 minutes and take an M-Mode for documentation.