### Purpose

Determination of fetal acid-base status through fetal scalp pH sampling. Fetal scalp blood sampling can provide valuable objective clinical information to help guide decision-making about method of delivery.

### Policy Statement

This policy provides clear direction as to the responsibilities’ for those involved in the collection, handling and analysis of a fetal scalp blood sample.

### Applicability

This policy and procedure applies to Covenant Health facilities, staff, physicians, students and any other persons acting on behalf of Covenant Health involved in this procedure.

### Responsibility

It is the responsibilities of Covenant Health’s physicians, nurses, and Respiratory Therapists to demonstrate commitment to the safety of all patients by following the policy and procedure that is outlined below.

#### 1. NURSES RESPONSIBILITIES

1.1. The nurse is to be familiar with the procedure and equipment.

#### 2. RESPIRATORY THERAPIST’S RESPONSIBILITIES-refer to Addendum A

#### 3. PHYSICIAN RESPONSIBILITIES

3.1. General Practitioners require a consult to an Obstetrician.
3.2. An informed specific consent must be obtained prior to procedure.
3.3. Fetal Scalp sampling may be obtained by the Obstetrician, Senior Obstetrical Resident, or by the Junior Obstetrical Resident supervised by an Obstetrician.
3.4. The physician should be aware of the size of sample necessary for accurate analysis.
3.5. Repeat FSBS prior to final diagnosis and treatment as applicable.
3.6. The physician should write a progress note discussing the procedure, results and plan.

### Principles

The fetal scalp pH is collected by the responsible physician as per the collection of fetal scalp capillary sample procedure. The sample is then appropriately handled and delivered to a Blood Gas Lab where a Respiratory Therapist will analyze the sample.
1. **INDICATIONS**
   Where facilities and expertise exist, fetal scalp blood sampling for assessment of fetal acid-base status is recommended in women with “atypical/abnormal” fetal heart tracings at gestations > 34 weeks when delivery is not imminent, or if digital fetal scalp stimulation does not result in an acceleratory fetal heart response. (III-C) (See Regional FHB Guidelines for definition of atypical/abnormal).

2. **CONTRAINDICATIONS**
   2.1. Known or suspected fetal blood dyscrasia (Hemophilia, von Willibrand's).
   2.2. Known maternal infection (hepatitis viruses, HIV, HSV, suspected intrauterine sepsis).
   2.3. Family history of hemophilia
   2.4. Suspected fetal bleeding disorder
   2.5. Face presentation

3. **LIMITATIONS**
   3.1. Provides information relevant to the time of sampling and not continuous information. Repeat sampling may be necessary.
   3.2. Technical limitations: operator skill, maternal discomfort, requires cervix to be at least 2 cm dilated and membranes to be ruptured.

4. **POTENTIAL COMPLICATIONS**
   4.1 Bleeding at incision site; caution should be used if vacuum delivery.
   4.2 Scalp infection.

**Procedure**

**NURSING**

1. **Ensure equipment assembled.**
   - Fetal Blood scalp sampling kit (NUSURGIX NataWand FSBS & Accessory Kit with NataLux Amnioscope)
   - Clinic bowl for perineal wash off
   - Doctor’s gown and gloves
   - Stat requisition, labels (2 patient ID labels and one bar code label) & biohazard bag for transport

2. Provide support to patient.

3. **Call Respiratory Therapist for collection**
   - GNCH - pager # 780-445-3322
   - MCH - call RT at 9 780 445 6366
     - Request “STAT Scalp pH in room #X. .”
     - Repeat request twice
     - If they are not able to attend the Respiratory Therapist will inform Labor & Delivery and request the unit staff to take sample to the Respiratory Therapist in the Blood Gas Lab in ICU. (refer to MCH Addendum “A “ page 5)
4. Prepare equipment, position patient for the procedure and wash off perineum.
5. Document in the patient care notes the time of the procedure, fetal and maternal response and results of analysis.
6. The labeled printout should be secured to a mount sheet in the patient chart.

**PHYSICIAN**

1. The physician inserts the vaginal cone.
2. The presenting part is cleansed of blood and mucous and silicone gel is applied.
3. A small stab incision is made on the fetal scalp, with the provided instrument, and the blood sample is drawn into the long capillary tube.
4. The physician should be aware of the size of sample necessary for accurate analysis. Preferred is a full tube which is 55uL. Minimum of 35uL for pH only which is half the capillary tube filled. Fill the capillary tube at least >3 cm for accurate analysis.

\[
\text{Capillary Tube 6 cm in length Volume is 55uL} \\
\text{3 cm}
\]

5. Once the sample is obtained, insert mixing wire and seal both ends with caps.
6. Hold the sealed capillary tube between two fingers and invert slowly. Allow the mixing wire to move all the way from one end to the other. This will allow the heparin to dissolve and mix with the blood to avoid the formation of clots.

**NOTE:** Please inform Respiratory Therapist that mixing wire was used.
7. After taking the sample apply pressure to the scalp incision with swab and ensure hemostasis visually prior to removing vaginal cone.
8. Once the sample is obtained, the sample should be immediately inverted to mix it with the heparin coating. Failure to do so will result in an unusable clotted specimen.
9. If magnetic mixing wire used to ensure no clots please inform the Respiratory Therapist as this will need to be removed before analyzing the sample.
RESPIRATORY THERAPIST/NURSING

1. The sample must be labeled with 1 patient label and 1 bar code label and 1 patient ID label with the requisition requesting “Fetal Scalp pH” is transported to the Blood Gas Lab for analysis.
2. The specimen is then analyzed by a Respiratory Therapist. (see Addendum A)
3. Continuous fetal monitoring is required throughout the procedure.

GENERAL INTERPRETATION OF RESULTS

- pH greater than or equal to 7.25. Fetal scalp sampling should be repeated in 30-40 minutes if the FHR abnormality persists.
- pH 7.21 - 7.24. Repeat Fetal scalp sampling within 30 minutes or consider delivery if rapid fall since last sample.
- pH less than or equal to 7.20. Delivery is indicated.
Addendum A
MCH Respiratory Therapist's Responsibilities for POCT Fetal Scalp pH

Respiratory Therapist's Responsibilities

1) The Respiratory Therapist will be paged by Labor and Delivery when there is a collection for analysis for scalp pH.
2) The Respiratory Therapist responsible for Labor and Delivery will respond to the STAT call to obtain sample and analyze for POCT.
3) Respiratory Therapist should be at the bedside for the collection of the sample.
4) If this Therapist is not able to respond to the STAT call it is their responsibility to communicate for another Respiratory Therapist to respond or to direct Labor and Delivery to bring the sample to the Blood Gas Lab in ICU. Communication needs to be made with the ICU Respiratory Therapist that the sample is on route to the Blood Gas Lab.

Obtaining sample, requisition and patient labels:

1) The sample is collected into a capillary tube by the responsible physician. The capillary tube is provided within the Fetal Scalp blood sampling kit.
2) Obtain patient labels and requisition. A patient label will be attached to one of the caps for the capillary tube. (Caps are provided in the sample kit.)
3) Respiratory Therapist is to Donn PPE as appropriate.
4) After collection of the sample the physician will hand the capillary tube to the Respiratory Therapist/Nurse who will cap both ends (one end with the labeled cap). The sample will need to be inverted to mix the sample.
5) The sample is labeled with appropriate patient label and placed in a Biohazard bag.
6) The labeled sample with 2 patient labels (1 bar code label and 1 patient ID label) and requisition requesting “Fetal Scalp pH” is transported to the Blood Gas Lab for analysis.

Respiratory Therapist Analysis of sample:

1) Make sure the ABL 825 analyzer is ready for use.
2) Respiratory Therapist is to Donn PPE as appropriate
3) Lift the inlet flap for the capillary sample.
4) Remove stopper from end of capillary tube, use magnet to remove mixing wire if used, and insert capillary tube into position.
5) Analyze the sample in the Flex Q mode.
6) In the parameter select screen select pH only.
7) Press the aspirate button.
8) Once sample has been aspirated remove the sampling device and close inlet flap.
9) Discard sample and biohazard bag in appropriate biohazard bin.
10) Enter appropriate information in the patient identification screen.
    Patient ULI #
    Patient last name
    Patient first name
    Sample Type: capillary
    Layout : Scalp pH
11) Only the pH will be reported.
12) Assess sample for errors, approve, and print report, place requisition in POCT binder.
13) Tape results to Lab Reports sheet with patient label and return results to L & D.

Caution: If magnetic mixing wire is used this must be removed from the sample with the magnet. If not removed, the magnetic mixing wire may be aspirated into the analyzer.
As a Standard of Practice it is recommended that:

- All samples for blood gas determination are collected in pre-heparinized capillary tubes (lithium heparinate).
- All air must be removed from the sample.
- All samples must be labeled with the patient's identification label.

Samples that will be disregarded without being analyzed

- All samples with visually apparent froth or large amounts of air bubbles
- All samples that are not labeled with patient identifiers
- All samples that are not collected in capillary tubes pre heparinized with sodium or lithium heparin.

Definitions

ICU - Intensive Care Unit
FSBS- Fetal scalp blood sample
HIV – human immunodeficiency virus
HSV – Herpes simplex virus
ID – identification
POCT – Point of Care Testing
PPE – personnel protective equipment
L & D – Labor and Delivery
ULI – Unique lifetime identifier
RT – Respiratory Therapist

Related Documents

References

3) JOGC. Sept. 2007. Fetal Health Surveillance: Antepartum and Intrapartum Consensus Guidelines, SOGC, S41
8) ABL 800 Series Operators Manual
9) ABL 800 Series Reference Manual
<table>
<thead>
<tr>
<th>Fetal Scalp Blood Sampling</th>
<th>Date Effective</th>
<th>Policy No.</th>
<th>Page</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>June 2012</td>
<td></td>
<td>7</td>
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10) Covenant Health Misericordia; Standards of Practice for Point of Care Testing, September 28, 2011
11) Instruction from supplier

**Revisions**
- Revision 6 May 2007 GNCH
- April 20, 2012 MCH
- June 4, 2012 MCH