WOMEN'S AND NEWBORN HEALTH PROGRAM
Clinical Practice Guidelines

TITLE:	Fetal Scalp Blood Lactate Determination	**NUMBER:**	7076
Sponsor**:**	Manager, Birth Unit	**Page:**	1 of 10
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Applies To:	Birth Unit Registered Nurses, Physicians and Midwives		

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PREAMBLE

The goal of intrapartum fetal health surveillance is to detect potential fetal decompensation and to allow timely and effective intervention to prevent perinatal/neonatal morbidity or mortality (SOGC, 2007). Intrapartum electronic fetal monitoring (EFM) has a high sensitivity to detect fetal heart rate abnormalities; however it has poor specificity for predicting fetal acidemia.

An abnormal or atypical fetal heart rate during labour may be caused by the inability of the baby to adapt to decreases in oxygen supply. Inadequate oxygen supply may lead to the development of acidosis (low blood pH levels) and increased lactate levels in the blood (East et al, 2015). Lactate levels in the subcutaneous tissues have been shown to increase before the pH decreases in the hypoxic process and therefore serves as an early marker (RCOG, 2015).

Fetal pH and lactate samples can be measured by fetal scalp blood sampling. Lactate is now the preferred measurement. Fetal lactate samples are more likely to be successfully performed, require fewer scalp incisions, and need a smaller amount of blood for analysis than fetal scalp pH samples. When comparing pH and fetal scalp lactate levels, there is no difference in neonatal outcomes such as umbilical cord gases, Apgar scores or neonatal intensive care unit admissions (East, 2015, Winnipeg Regional Health Authority, Mount Sinai Hospital).

These guidelines outline the procedure for fetal scalp blood lactate sampling to provide valuable objective clinical information to guide decision making about the clinical management including the preferred timing and method of delivery.

GUIDELINES

1. Review the entire clinical picture and assessment when considering if fetal scalp blood lactate sampling (FSBLS) should be performed. When there is clear evidence of fetal compromise, delivery should be expedited and FSBLS should not be undertaken.

2. Fetal scalp blood sampling is performed by obstetrician/delegate and requires a consult to be completed.

3. Prior to fetal scalp sampling ensure that verbal consent is obtained from the patient or patient designate by the physician and documented on the patient health record.

4. Complete a vaginal exam to establish cervical dilation and station of fetal head.

5. Indications for fetal scalp blood lactate sampling:

    - Gestational age greater than 34 weeks with atypical and/or abnormal fetal heart rate tracing when delivery is not imminent
    - Cephalic presentation
    - Ruptured membranes

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- Cervix of at least 2-3 centimeters dilated
- Resources are available to perform the analysis in a timely manner

6. Contraindications:
    - Gestation less than 34 weeks
    - Clear evidence of a serious fetal compromise (do not delay delivery to perform sampling)
    - Potential fetal bleeding disorders (e.g. suspected fetal bleeding disorder or family history of hemophilia)
    - Malpresentation (e.g. face presentation)
    - Maternal infection such as HIV, hepatitis viruses, active genital herpes, suspected or proven maternal sepsis

PROCEDURE

PRIOR TO TESTING

1. Prior to using the Nova StatStrip Lactate meter ensure the quality control has been performed within the last 24 hours (see *IWK Health Centre Point of Care Testing- Stat Strip Lactate Meter # 3103*).

2. Gather supplies:
    - Fetal blood sampling cart (intrauterine intervention cart)
    - Fetal blood sampling (FBS) kit
    - Nova StatStrip Lactate test strips
    - Nova StatStrip Lactate meter
    - Prep sponges

3. Assist the patient into the position preferred by the physician.
    - Lithotomy position with legs on the foot rests or in stirrups or
    - Lateral sims position with the upper leg flexed and supported and the lower leg extended. The buttocks extend over the edge of the bed.
    - Raise the bed to a high level

4. Cleanse/prep the woman's perineal area with prep sponges.

OBTAINING THE SAMPLE

1. The physician will obtain the fetal scalp blood lactate sample during uterine relaxation (Refer to Appendix B for the detailed guidelines for specimen collection.

2. The RN will monitor the fetal heart rate (FHR) continuously throughout the procedure by electronic fetal monitor as per Policy #7070 – *Intrapartum Fetal Health Surveillance*. If the patient has an epidural palpate the abdomen to determine when the contraction subsides and inform the physician of the same.

3. The physician will insert the endoscope/amnioscope with obturator into the vagina against the fetal presentation ensuring the cervix is not trapped. Remove the obturator and adjust the endoscope to ensure clear visualization of the fetal scalp. Note: Be sure to avoid the fetal scalp electrode if in place. Maintain close contact between the endoscope and scalp to prevent leakage of fluid.

4. Once the scalp has been visualized and wiped clear of meconium and vernix, a small incision is made in the fetal scalp with the blade provided in the fetal blood sampling kit.

5. The RN will note the incision time and document on the maternal health record in relation to the fetal heart rate tracing.

6. The physician will place the tip of the capillary tube in the incision and collect 1-2 centimeters (10 microliters (µL), the tube capacity is 55 µL. **Note:** 0.6 µL blood sample is required for the test strip reading.

7. If unable to obtain an adequate sample after 2 attempts, obtain additional help from another experienced provider if available.

8. The physician will remove the capillary tube from the sampling wand and hand the tube to the RN. Do NOT attempt to mix, shake, tip, or otherwise disturb the sample. The FBS kits contain heparin so mixing is not required or recommended.

9. Record the time of the FSBLS collection in the patient's health record in relation to the FHR.

BLOOD LACTATE ANALYSIS

1. The RN will receive the collection tube from the physician using gloves.

2. Gently wipe the end of the collection tube with a gauze and clean the end of the tube. Then quickly tap to remove a small amount of blood in order to have a "clean" sample. Do not hold a sponge or gauze to the end of the collection tube as this will potentially empty the tube.

3. Apply blood sample when prompted immediately after inserting the test strip into the meter.

4. Lactate results will appear in 13 seconds after the application of the blood sample onto the strip.

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Classification of fetal scalp blood lactate sample results:

Interpretation:	**If the FSBLS result is:**	**Action:**
NORMAL	Less than 4.2 mmol/L	Repeat the fetal scalp blood sampling in 1 hour if the EFM abnormality persists, or sooner if required. If the EFM returns to normal, there is no need to repeat sampling.
PRE-ACIDOTIC	4.2 – 4.8 mmol/L	Repeat fetal scalp blood sampling in 30 minutes, or consider delivery if a significant change has occurred since the previous fetal scalp blood sampling measurement.
ACIDOTIC/ABNORMAL	Greater than 4.8 mmol/L	Stop oxytocin. Immediate delivery is indicated. Notify attending physician if not already done

5. Communicate patient results to doctor. Refer to Classification of Fetal Scalp Blood Lactate Sample Result for Interpretation of Results.

6. Document results on patient chart indicating POC Scalp Lactate result, unit of measure (mmol/L), collector's initials, date, time and tester's initials.

POST PROCEDURE

1. If the FSBLS kit is no longer required: check the blade is retracted intact and dispose in the sharps container.

2. Continue electronic fetal monitoring (EFM).

3. Assist the woman into a comfortable position.

4. Document:
    - FSBLS POC results on the patient's health record.
    - Patient's response to procedure
    - Any associated interventions or information related to procedure.

FOLLOWING DELIVERY

1. After delivery assess the incision site(s) on the newborn scalp. Cleanse the area.

2. When transferring the newborn inform the receiving nurse that fetal scalp sampling was performed and identify the incision site(s).

3. Document the FSBLS sample site assessment on the newborns health record.

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RELATED DOCUMENTS

Policies

IWK Health Centre Policy #7070 - Intrapartum Fetal Health Surveillance

IWK Health Centre Policy # 3103 - Point of Care Testing Stat Strip Lactate Meter

Appendices

Appendix A – Definitions

Appendix B – Instructions for Lactate Specimen Collection

Appendix A

Definitions

Lactate – A metabolite produced during glucose metabolism as a result of tissue hypoxia.

Point of care testing (POCT) – Laboratory testing that occurs near the patient, often at the patient bedside. POCT can be advantageous in situations requiring rapid turnaround time of test results for clinical decision making.

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Appendix B

Instructions for Lactate Specimen Collection

1. Using aseptic technique, remove the kit from the outer bag, place on a suitable surface and unfold outer drape to form a sterile filed.
2. Select a capillary tube from the tube in the kit and load into the holder. Locate the end of the tube into the holder and then gently advance into the rear tube grip. Ensure the tube is secure before sampling.
3. Prep the perineum and vagina and complete a vaginal examination to determine dilation and station of fetal head.
4. Insert the plastic capillary tube into the sampling wand tube holder, apply a light pressure to secure the capillary tube.
5. Locate the Amnilume light Module into the slot in the amnioscope and push gently to engage. The light will activate when the light source is correctly fitted. To turn the light off, withdraw the light module.
6. Insert the amnioscope complete with obturator into the vagina against the fetal head ensuring the cervix is not trapped.
7. Remove the obturator. Position the beveled end by rotating the endoscope to obtain the best possible seal against the fetal presentation. Rotate to finally position the light source module in the upper quadrant.
8. Maintain close contact between the amnioscope and scalp to prevent the leakage of amniotic fluid.
9. Clean the puncture area with the green x-ray detectable gauze swabs and forceps provided.
10. Spray the fetal scalp with ethyl chloride spray or other suitable agent to promote capillary action if required.
11. With a clean swab stick, apply a thin layer of white paraffin to puncture area. Remove excess with a new dry swab stick before skin puncture.
12. The sampling wand comes pre-fitted with a FBS blade. Lightly holding the shaft and rear finger grip, push the grip forward to expose the blade. Ensure the blade is locked forward before use.
13. Perform skin puncture through the amnioscope. Either make a vertical stab, remove and rotate the blade 90 degrees and make a second stab to form a cross or make a vertical stab, then angle the blade downwards and extend the incision using the front edge of the blade to produce a single incision 4-5mm long.
14. Always wait for a good size (3-4mm) bead to form on the surface before collection. Never slash at the scalp and avoid multiple small stabs.
15. To collect the blood sample, depress the button on the wand shaft to retract the FBS blade and angle the capillary tube into the bead.
16. Rapidly collect blood sample, filling the tube at least 1-2 centimeters and hand to the RN. DO NOT attempt to mix, shake, tip or otherwise disturb the sample.
17. Gently wipe the end of the collection tube with a gauze pad to clean the end of the tube. Then quickly tap to remove a small amount of blood in order to have a “clean” sample. Do not hold a sponge or gauze to the end of the collection tube as this will potentially empty the tube.

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District Health Authority/IWK Policies Being Replaced

(Please List)

Version History

(To Be Completed by the Policy Office)

Major Revisions (e.g. Standard 4 year review)	Minor Revisions (e.g. spelling correction, wording changes, etc.)

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