

# Fetal Scalp Blood Lactate (FSBL) Sampling

## Site Applicability

SPH Pregnancy, Birthing and Newborn Centre

## Practice Level

Specialized: Physicians (with perinatal privileges), Registered Midwives, Perinatal Registered Nurses

## Requirements

Fetal Health Surveillance (FHS) education is strongly recommended for all perinatal care providers (physicians, midwives and nurses) every 2 years.

FSBL sampling is performed by a physician (i.e. obstetrician or obstetrical resident) with the assistance of an RN and the support of the patient's primary maternity care provider (PCP) (if present).

Physicians and Registered Midwives without FSBL sampling competency must consult obstetrics in the event that FSBL sampling is proposed as part of the patient's plan of care.

ONE-TIME training on the procedure and the use of the lactate meter is required. Nursing is also required to complete the [Competency Checklist](#).

On-going YEARLY competency maintenance on use of the lactate meter is required for nursing:

- Completion of [Quality Control levels 1 and 2](#)
- Completion of LearningHub course ([Course code 23800](#))

## Algorithm

FSBL Result	Classification	Action
Less than 3.0 mmol/L	Normal	Continue EFM Repeat FSBL in 30 minutes if FHR abnormality persists
3.0 to 4.5 mmol/L	Indeterminate	Repeat FSBL within 30 minute Consider delivery if significant rise in lactate
Greater than 4.5 mmol/L	Abnormal	Delivery is indicated

## Need to Know

Fetal scalp blood lactate (FSBL) sampling is performed in the context of fetal heart rate (FHR) tracings that are classified as atypical or abnormal, and assesses for the presence of fetal acidemia.

Lactate can differentiate between metabolic and respiratory acidosis in the fetus. Lactate is a point of care test (POCT) at the bedside, takes less than 1 minute for results, and requires a smaller blood sample than fetal scalp sampling for pH.

## Equipment and Supplies

<ul style="list-style-type: none"> <li>FSBL Sampling cart</li> <li>Bedside table</li> <li>FSBL Sampling Kit (Rocket Kit)</li> <li>Fetal monitor</li> <li>Nova Stat Lactate Test Strip</li> </ul>	<ul style="list-style-type: none"> <li>Nova Stat Lactate Test Meter</li> <li>2 x 2 gauze</li> <li>Soap and water for perineal care</li> <li>Sterile gloves and clean gloves</li> </ul>
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## Protocol

<b>Indications</b>	<ul style="list-style-type: none"> <li>Atypical or abnormal electronic fetal monitoring (EFM) tracing</li> <li>Gestational age greater than or equal to 34+0 weeks</li> <li>Cephalic presentation</li> <li>Ruptured membranes</li> <li>Cervix at least 3 cm dilated</li> </ul>
<b>Contraindications</b>	<ul style="list-style-type: none"> <li>Gestational age less than 34+0 weeks</li> <li>Face, brow, breech, or unknown presentation</li> <li>Infections in the pregnant patient (e.g. HIV seropositive or high-risk/unknown HIV status, active genital herpes, hepatitis B, hepatitis C, suspected or proven sepsis)</li> <li>Suspected or known bleeding disorder</li> <li>Family history of hemophilia</li> </ul>
<b>Relative Contraindications</b>	<ul style="list-style-type: none"> <li>Lifestyle with higher risk for sexually transmitted infection</li> <li>Presence of fever in labour or evolving chorioamnionitis <ul style="list-style-type: none"> <li>Use clinical judgement to determine role of FSBL sampling</li> </ul> </li> </ul>
<b>Potential Complications</b>	<ul style="list-style-type: none"> <li>Scalp abscess</li> <li>Sepsis</li> <li>Hemorrhage</li> <li>Cephalohematoma</li> </ul>

## Assessment

### 1. Pre-procedure:

- Confirm cervical dilation and membrane status
- Review patient history and status for presence of any contraindications (See [below](#))
- Baseline vital signs (VS), including temperature
- Continue to monitor FHR as per Fetal Health Surveillance: Intrapartum guideline ([B-00-07-10048](#))
- Physician obtains verbal consent
- RN confirms quality control (QC) has been done within the last 24 hours
  - [Perform QC if required](#)

### 2. During procedure:

- Continue to monitor FHR as per Fetal Health Surveillance: Intrapartum guideline
  - If the patient is unaware of their contractions, RN or assisting PCP will palpate the abdomen and inform the physician when contractions and resting tone occur
- Monitor and assess patient's coping and tolerance of the procedure

### 3. Post-procedure:

- [Determine plan of care based on FSBL result](#) (i.e. time of next assessment, etc.)
- Continue to monitor patient VS until delivery as per Prescriber's Orders, guidelines, and patient's condition dictates
- Continue to monitor FHR as per Fetal Health Surveillance: Intrapartum guideline
- Monitor patient tolerance of procedure and continued treatment
- Monitor for frank red vaginal bleeding, pain, etc.

### 4. Post-delivery:

- Assess newborn's scalp to identify FSBL sample site and condition of scalp
  - Cleanse site
  - Continue to monitor site for signs of infection
  - Document site and condition in Cerner

## Interventions

Ensure that a supportive environment is preserved by maintaining a calm and controlled environment.

In the event that the FSBL result is abnormal (i.e. greater than 4.5 mmol/L), the pregnant patient and support person(s) will be prepped for emergent delivery.

If FSBL result is indeterminate or normal (i.e. less than or equal to 4.5 mmol/L), review plan of care and determine next steps, including when next to perform a repeat FSBL sampling.

**Steps****1. Patient Preparation:**

- Ensure patient has time to ask any questions they may have about the procedure
- Ensure patient has intravenous access
- Assist patient into position as preferred by physician (ensure patient is not positioned for an extended period of time to prevent joint, muscle, and neural strain, and that they are wedged appropriately):
  - Lithotomy position with legs on foot rest or in stirrups (ensure patient is wedged appropriately), or
  - Lateral Sims' position with upper leg flexed and supported, and lower leg extended. Buttocks extended over edge of bed
- Raise bed to physician's preferred height
- Perform perineal care with soap and water

**2. Equipment Preparation:**

- Gather all necessary equipment and supplies
- Create clean work surface on bedside table for FSBL sampling kit to be opened upon:
  - Ensure that sterility of the kit is maintained as kit can be used for repeat sampling at a later time for the same patient
- Create clean work surface on FSBL sampling cart to prepare Lactate meter and perform test:
  - Place meter and test strips on clean work surface
  - [Prepare meter with test strip](#)
  - Ask physician for a white cap from inside FSBL sampling kit

**3. Clinician Preparation:**

- Don appropriate PPE prior to procedure
- Ensure adequate personnel is present to assist with performing tasks

#### 4. Obtaining FSBL Sample:

Role	Action
RN	<ul style="list-style-type: none"> <li>Continue to monitor EFM throughout procedure</li> <li>If the patient is unaware of their contractions, palpate the abdomen and inform the physician when contractions and resting tone occur</li> </ul>
Physician	<ul style="list-style-type: none"> <li>Insert the endoscope into the vagina, and identify the fetal head <ul style="list-style-type: none"> <li>Be sure to avoid the fetal scalp electrode if in place</li> </ul> </li> <li>Attach light source to the endoscope</li> <li>Prepare the fetal scalp by cleaning the chosen area</li> <li>Apply paraffin to chosen area using the long cotton swab</li> <li>Attach collection tube to lancet</li> <li>Push the end of the lancet to expose the blade</li> <li>Ensure collection is occurring with uterine resting tone, between contractions</li> <li>Make small incision and then retract the blade by pushing the button on the side of the lancet</li> <li>Tell RN when an incision is made</li> </ul>
RN	<ul style="list-style-type: none"> <li>Note the incision time on the EFM tracing</li> </ul>
Physician	<ul style="list-style-type: none"> <li>Place collection tube into the incision</li> <li>Collect 1 cm (10 microlitres) of blood. <ul style="list-style-type: none"> <li>Tube capacity is 55 microlitres (55 microlitres = 0.055 mL) (0.6 microlitre blood sample is required for the test strip reading)</li> <li>If unable to collect blood after 2 attempts, obtain additional help</li> </ul> </li> <li>Remove the collection tube from the lancet and hand it to the RN</li> </ul>
RN	<ul style="list-style-type: none"> <li>Record time of the FSBLS collection on FH tracing and in Cerner</li> </ul>
Physician	<ul style="list-style-type: none"> <li>Place the lancet on the sterile drape for disposal or reuse</li> </ul>

### 5. Completing FSBL Analysis:

RN	<ul style="list-style-type: none"> <li>Glove sterily before receiving the capillary tube</li> <li>Receive the collection tube from physician</li> </ul>
	<ul style="list-style-type: none"> <li>Wipe the end of the collection tube with gauze to remove excess blood outside the tube</li> <li>Dab collection tube on tissue to remove small amount of blood to have “clean” sample</li> </ul>
	<ul style="list-style-type: none"> <li>Apply white cap to empty end of collection tube</li> <li>Pinch white cap to create a drop of blood at end of collection tube; ensure no bubbles present</li> <li>Apply sample to end of test strip; allow strip to draw sample by capillary action</li> <li>Lactate result will appear in 13 seconds after application of sample to test strip</li> </ul>

### 6. Post-Procedure:

Physician	<ul style="list-style-type: none"> <li><a href="#">Determine whether repeat FSBL sampling will be required:</a> <ul style="list-style-type: none"> <li>If yes, preserve sterility of the FSBL sampling kit for later use</li> <li>If no, ensure lancet tip is intact and dispose of in SHARPS container and kit</li> </ul> </li> <li>Assist patient into comfortable position</li> <li>Communicate next steps to patient, family, and RN</li> <li>Document procedure, results, and plan of care</li> </ul>
RN	<ul style="list-style-type: none"> <li>Assist patient into comfortable position</li> <li>Confirm next steps for plan of care</li> <li>Document results on EFM tracing,</li> <li>Document in Cerner: <ul style="list-style-type: none"> <li>Time of procedure</li> <li>Physician performing procedure</li> <li>Nurse conducting FSBL analysis</li> <li>Meter number</li> <li>FSBL result</li> <li>Patient position</li> <li>Patient comfort</li> <li>Plan of care</li> </ul> </li> <li>Document required information on Fetal Scalp Lactate Audit form</li> <li><a href="#">Clean meter</a> and return to docking station</li> </ul>

## Documentation

- Documentation will follow PHC and Cerner guidelines
- All assessments and interventions should be documented in real time
- At time of procedure, ensure current assessments are documented and specific documentation is completed
- FetaLink
- Cerner PowerChart → Interactive View and I&O →
  - Labour and Delivery Band:
    - FHR Monitoring including Maternal Heart Rate
    - FHR Monitoring Annotations
    - Contraction Information
    - Maternal Comfort/Activity Overview
    - Vital Signs
    - Vaginal Exam
    - Membrane Status Information
    - Pain Assessment
    - Peripheral IV
    - Provider Notification
  - OB Special Assessment Band:
    - Point of Care Testing
      - Lactate Fetal Blood POC fields
  - Newborn Systems Assessment:
    - Integumentary
    - Incision/Wound/Skin/Pin Site
- Newborn Record Part 1
- Fetal Scalp Blood Lactate Audit Form

Point of Care Testing	
Lactate Fetal Blood POC Collected By	
Lactate Fetal Blood POC Start Time	
Lactate Fetal Blood POC Serial Number	
Lactate Fetal Blood POC Result	mmol/L
Lactate Fetal Blood POC Non-Numeric	
Urinalysis Dipstick POC Type	
Pregnancy Test Urine POC	
Opiates (OPI) Screen Urine POC	
Hydromorphone Screen Urine POC	
Transcribed Blood Ketones-Patient Meter	
Ketometer Device Information	
Transcribed Blood Ketones Comments	

## Patient and Family Education

- Inform patient of reasons for the procedure. Ensure physician has explained potential risks and benefits.
- Inform patient of the meaning of results – continue with labour and monitor baby or proceed with Caesarean birth.
- Provide support and reassurance in the face of other potentially invasive procedures (e.g. Caesarean birth).

## Related Documents

1. [B-00-07-10048](#) – Fetal Health Surveillance: Intrapartum
2. [B-00-07-13045](#) – Standard Infection Control Precautions

## References

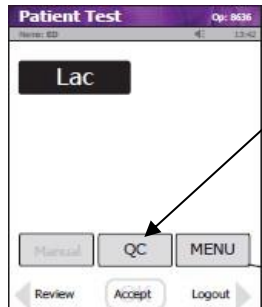
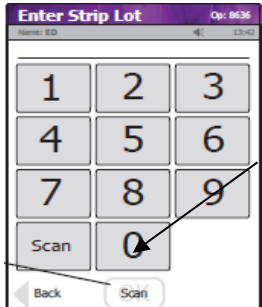
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- Young, C., Ryce, A. (2018). Fetal Scalp Lactate Testing During Intrapartum Pregnancy with Abnormal Fetal Heart Rate: A Review of Clinical Effectiveness, Cost-Effectiveness, and Guidelines [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532205/>



## Appendices

- Appendix A – [Nova StatStrip Lactate Meter Quality Control](#)
- Appendix B – [Nova StatStrip Quick Reference Guide](#)
- Appendix C – [Nova StatStrip Troubleshooting Guide](#)
- Appendix D – [Nova StatStrip Cleaning Recommendations](#)
- Appendix E – [Nova StatStrip Lactate Meter Competency Checklist](#)



## Appendix A – Nova StatStrip Lactate Meter Quality Control

	Action
1.	Both levels of Quality Control (QC) must be performed within the 24 hours prior to patient testing and/or twice a week on Monday and Friday by the end users.
2.	QC should also be performed when: <ul style="list-style-type: none"> <li>When opening a vial of test strips that is a new lot number</li> <li>When the meter is dropped</li> <li>When troubleshooting</li> <li>When there is a concern for inaccurate results</li> </ul>
3.	Gather all required materials. Check the expiration dates on QC vials and Lactate teststrips and discard if expired. If necessary, open a new QC vial or test strip vial, record the date opened and the date to discard in the space provided on the QC vial label.  <b>The QC and test strips are stable for 90 days after opening.</b>
4.	At Patient Test screen, press the <b>QC</b> .  <p><b>QC</b> soft key</p>
5.	Scan the Lactate strip barcode by pressing <b>Scan</b> .  <p><b>Scan</b> soft key</p>
6.	Scan the QC bottle barcode by pressing <b>Scan</b> .

Action (continued)		
7.	<p>Insert test strip firmly into meter.</p> <p>Do not pinch end where drop will be applied.</p> <p>When it is inserted correctly, the Apply Sample screen displays.</p>	
8.	<ol style="list-style-type: none"> <li>1. Gently mix Lactate control solution and discard the first drop onto a tissue.</li> <li>2. Apply a drop of control solution to the end of the test strip until enough control is drawn into the well of the teststrip. An audible beep will sound.</li> <li>3. Recap Lactate control solution.</li> </ol>	
9.	On the Testing Sample screen, the time remaining before test is complete will be displayed.	
10.	The QC Result screen will display the numerical result and a Pass or Fail.	
11.	Record the QC result on the StatStrip Lactate Meter Quality Assurance Chart.	
	<b>If</b>	<b>Then</b>
	<b>Pass</b>	Proceed to the next level of QC or patient sample.
	<b>Fail</b>	Check expiration dates on test strips and control vial. Repeat QC test.
	<b>If</b>	<b>Then</b>
	<b>Pass</b>	Proceed to the next level of QC or patient sample.
	<b>Fail</b>	Repeat test with a new QC vial. If test fails, repeat on the second meter in Maternity. Send problem meter to the Point of Care Testing Lab for further troubleshooting.
12.	Press <b>Accept</b>	
13.	Remove test strip and discard in the regular waste.	

## Appendix B – Nova StatStrip Quick Reference Guide

Provincial Health Services Authority



01JA StatStrip Lactate Quick Reference Guide			
Identifier:	PHC POC LAC 01JA	Version #:	1.2
Folder:	PHC POC CHEM	Type:	Job Aid (3yr)
Subfolder:	STATSTRIP LACT	Effective on:	2022-08-04

### 01JA Nova StatStrip Lactate Meter Quick Reference Guide

#### Supplies **\*\*Remember to write Open date and Discard date on QC & Test Strip vial\*\***

Lactate controls, Lev 1 & 2	Lactate test strips	FSBL Sampling kit (Rocket kit)
Stable for 90 days after opening	Stable for 90 days after opening	Gauze
		Gloves

#### QC (Quality Control) Test

- To be tested on Monday & Friday
- In-between days, QC prior to patient test (if not done already)
- 1. **Enter Strip Lot:** Press Scan to scan strip lot on vial.
- 2. **Enter QC Lot:** Press Scan & scan QC Lot on vial.
- 3. **Insert Test Strip**
- 4. **Apply Sample:** Mix QC vial well. Apply 2nd drop to strip.
- 5. **QC Result:** Record on QC chart. Repeat if unacceptable. Use only if QC within range.

#### Patient Test – Perform patient testing only with a physician's order

1. **Enter Strip Lot:** Press Scan to scan strip lot on vial.
2. **Enter Patient ID:** Manually enter Patient ID.
3. **Insert Test Strip**
4. **Collect Fetal Scalp Lactate sample** (performed by Physician) - 1-2 cm in capillary tube.
5. **Wipe** the outside of the capillary tube to remove any contaminants.
6. **Remove first drop** by dabbing collection tube on tissue to obtain a "clean" sample.
7. **Apply white cap** to empty end of collection tube
8. **Apply Sample:** Pinch white cap to create a drop of blood at sample end of collection tube. Touch end of Lactate test strip to drop of blood till beep is heard.
9. **Patient Result:** Record FS Lactate result on patient record (Cerner). Include date/time, requesting Physician and Nurse performing test and meter number.

#### Clinical Guidelines for Delivery

If the FS Lactate is:	Then:
Less than 3.0 mmol/L	FS Lactate is Normal
3.0 – 4.5 mmol/L	Repeat FS Lactate collection within 30 minutes
Greater than 4.5 mmol/L	Delivery is indicated (fetal distress)

#### Lactate Audit Data Collection:

- Please remember to input patient's entire MRN (from patient's label)
- Please complete the audit form (i.e. delivery outcomes, pH, etc.)

#### For further assistance contact:

Point of Care Lab (M-F) ext 62525, Core Lab (after hours, weekends) ext 63222

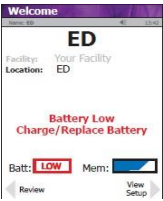

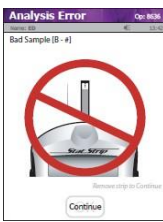


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Reviewed on:	2019-02-21	Approved on:	2021-05-11
Renewed by:	Sheri Young	Revision Date:	2025-08-04
Renewed on:	2022-08-04		

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Page 1 of 2

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## Appendix C – Nova StatStrip Troubleshooting Guide

If Display shows	Then
<p>Battery Low</p> 	<p>Place meter into the Charging Station. OR change battery with a spare battery.</p>
<p>Analysis Cancelled</p> 	<p>The test strip was removed before completing the test. Repeat test with new test strip.</p>
<p>Bad Sample</p> 	<p>Repeat test with new test strip. If error code persists, repeat test with another test strip from another test strip vial. See note below.</p>
<p>Replace Strip</p> 	<p>Repeat test with new test strip. If error code persists, repeat test with another test strip from another test strip vial. See note below.</p>
<p>Flow Error</p> 	<p>Caused by either insufficient or incorrect sample application.  Repeat test with new test strip. If error code persists, repeat test with another test strip from another test strip vial. See note below.</p>

**NOTE:** If error still persists with new test strips from a different vial, the problem is with meter or the sample itself. Run both levels of QC to evaluate the meter. If QC is out of range, obtain the replacement meter from the Point of Care Lab.

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**Appendix D – Nova StatStrip Cleaning Recommendations**

1. Perform hand hygiene and use personal protective equipment. (e.g. gloves)
2. Use approved cleaning solution only (e.g. CaviWipes).
3. Make sure no fluid enters the test strip port or gets on the bar code scanner and electrical connector.
4. To clean the meter, wipe all the external surfaces of the meter with one wipe.
5. To disinfect the meter, wipe the meter with another wipe ensuring the meter surface stays wet for one minute. Use a new wipe if the meter surface needs to be re-wiped.
6. Always allow meter to thoroughly air dry before putting back into use.

## Appendix E – Nova StatStrip Lactate Meter Competency Checklist

Provincial Health Services Authority



01F1 Nova StatStrip Lactate Meter Competency Checklist			
Identifier:	PHC POC LAC 01F1	Version #:	1
Folder:	PHC POC CHEM	Type:	Checklist (3yr)
Subfolder:	STATSTRIP LACT	Effective on:	2022-07-21

### 01F1 Nova StatStrip Lactate Meter Competency Checklist

**Employee name:**  
(please print): \_\_\_\_\_

**Date trained:** \_\_\_\_\_

**Training Status:**

**Employee ID:** \_\_\_\_\_

**Job Title:** \_\_\_\_\_

New ☐  
Recertify/Annual ☐

In order to use the Clinitek Status for patient testing please complete the following:

- o Review Nova StatStrip Lactate Meter Procedure
- o Complete Competency Checklist
- o Complete the Learning Hub course #23800: Laboratory - PHC - Point of Care Fetal Scalp Lactate Meter Competency Assessment.
- o Once completed, scan and email to [phclabpoc@providencehealth.bc.ca](mailto:phclabpoc@providencehealth.bc.ca)

Tasks/Competency	Met
Identify meter components and understands home screen	
Checks battery status, date and time	
Understands annual recertification requirements: complete Learning Hub course #23800 FSL competency assessment	
Knows when opening a new QC vial to write date and to discard 3 months after opening	
Scans test strip lot # and QC lot #	
Prepares QC solution: inverts vial to mix, wipe first drop	
Inserts strip into meter correctly	
Waits for Apply Sample screen and applies sample to strip correctly	
Documents QC result on Monthly QC chart	
Explains corrective action when QC is out of range	
Simulates patient testing – knows to discard first drop in patient testing	
Knows to document results in patient chart immediately to prevent errors	
Knows which values require immediate action	
Checks meter for visible blood & other contaminants and can demonstrate meter cleaning and drying technique.	
Successfully completes Nova StatStrip Lactate meter quiz in Learning Hub	

**Employee:** I understand all the above items and I will follow applicable procedures.

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Educator/Trainer:** The employee has completed training and is certified to use the Nova StatStrip Lactate meter.

**Name (please print):** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

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Page 1 of 1

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**Developed By**

Maternity Safety and Quality Council

Nurse Educator, SPH Pregnancy, Birthing and Newborn Centre

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	Maternity Safety and Quality Council Professional Practice Standards Committee
<b>Owners:</b>	PHC
	SPH Pregnancy, Birthing and Newborn Centre