Fetal Blood Sampling

Classification :	Guideline		
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Departments/Group this Document applies to:	Maternity		
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Unique Identifier: MIDW/GL/49	**Status:** Approved	**Version No:** 4.3	
Guideline to be followed by (target staff): Obstetricians, Midwives and Student Midwives			
To be read in conjunction with the following documents:			
Are there any eCARE implications? No			

CQC Fundamental standards:
Regulation 9 – person centred care
Regulation 10 – dignity and respect
Regulation 11 – Need for consent
Regulation 12 – Safe care and treatment
Regulation 13 – Safeguarding service users from abuse and improper treatment
Regulation 14 – Meeting nutritional and hydration needs
Regulation 15 – Premises and equipment
Regulation 16 – Receiving and acting on complaints
Regulation 17 – Good governance
Regulation 18 – Staffing
Regulation 19 – Fit and proper

Disclaimer –

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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Guideline Statement

- FBS is indicated in an abnormal CTG.
- Obtain capillary blood from fetal scalp.
- Normal result >7.25, repeat within the hour if trace still non- reassuring or abnormal.
- Borderline results 7.21>7.24, repeat within 30 minutes.
- Consider full clinical picture.
- FBS only appropriate where immediate delivery is not indicated first.

Executive Summary

To obtain a scalp sample of capillary blood from the fetus in order to assess level of hypoxia / fetal acidosis, in the presence of abnormal Cardiotocography (CTG) in order to facilitate further obstetric management.

Important to note that FBS is an invasive procedure and should be performed only when the results will have a bearing on further management.

Definitions

Uncommon words or words with unique meanings should be defined and listed in alphabetical order.

1.0 Roles and Responsibilities:

Doctors: Decision making, discussion, planning care
Midwives and Student midwives: intrapartum care

2.0 Implementation and dissemination of document

Guideline is available on the Intranet and has followed the Guideline review process prior to publication

3.0 Processes and procedures

3.1 Indications for fetal scalp sampling:

- For abnormal fetal heart trace pattern or where there are concerns about fetal acidosis. This should be in the absence of acute fetal compromise

3.2 Materials required:

- Disposable Fetal Blood Sampling tray
- Light source (in Fetal Blood Sampling tray)
- Calibrated pH machine – please check the machine prior commencing the procedure. If the machine is not working then there is an alternative machine available in theatres OR inform the Biochemistry Department Bleep holder via the switchboard that an urgent Fetal Blood Sampling (FBS) sample is on its way.
- Ethyl chloride spray

(N.B. no ice required during the transfer, but important to roll the capillary between your hands to prevent clotting)

3.3 Provide Information:

- Why the test is being advised.
- The results will inform us on how baby is coping with labour
- Involves a vaginal examination using a small device similar to a speculum
- A sample of blood will be taken from the baby's head by making a small scratch on the baby's scalp. This will heal quickly after birth, but there is a small risk of infection.
- It can help to reduce the need for further, more serious interventions.
- Explain what the different outcomes of the test may be including inability to acquire sample and the actions that will follow each result.
- There is a small chance that it will not be possible to obtain a blood sample (especially if the cervix is less than 4cm dilated). In such situations, a Caesarean section or instrumental birth may be needed if fetal scalp stimulation does not generate accelerations.

3.4 Procedure:

- Following acquisition of consent/ information, position the woman ideally in left lateral, otherwise in lithotomy with left-sided tilt.
- With the obturator in place, introduce the amnioscope downwards and backwards into the vagina, then through the dilated cervix (3cm minimum dilatation). Remove obturator and depress amnioscope till it lies at right angles to the fetal scalp.
- With a swab, remove excess liquor and blood.
- Spray ethyl chloride onto the exposed scalp for a few seconds. This stimulated reactive hyperaemia.
- Smear sterile paraffin grease over the scalp to enhance globule formation of the fetal blood.
- A stab incision is made in the scalp with a guarded blade provided in the FBS set. Fetal blood oozes out of the incision and forms a globule, which is collected as a continuous column in a pre-heparinised capillary tube. Avoid bubbles within the tube as this is a common reason for no results interpretation.
- Obtain two good samples. The samples should show very similar results (pH within 0.02 and base excess within 2)
- Analyse the samples immediately using the nearest calibrated blood gas analyser. Measure either lactate or pH (normally as for MKUH).
- Ensure haemostasis after obtaining the sample.
- There should be no more than 2 attempts to obtain a sample. Discuss with consultant if difficulties in obtaining samples.
- Supervision is required until operator signed off as being competent.
- Document procedure and results in eCare. Include the necessary action to be taken.

3.5 Recommendation on fetal blood sampling

- Prior to carrying out or repeating FBS, start conservative measures and treat reversable factors (IV fluids if indicated, change position, reduce/stop syntocinon, consideration of terbutaline).

- If the cardiotocograph trace is pathological, offer digital fetal scalp stimulation. If this leads to an acceleration in fetal heart rate, only continue with FBS if the CTG is still pathological.

- If digital fetal scalp stimulation (during vaginal examination) leads to an acceleration in fetal heart rate, regard this as a sign that the baby is healthy and should be correlated to the clinical picture.

- FBS should be advised in the presence of an abnormal FHR trace with no acceleration on fetal scalp stimulation, unless there is clear evidence of acute compromise.

- Refer to a Consultant Obstetrician where a third FBS is considered necessary

- Where assisted birth is contemplated because of an abnormal FHR pattern, in cases of suspected fetal acidosis FBS should be undertaken in the absence of technical difficulties or any contraindications.

- Where there is clear evidence of acute fetal compromise (for example, prolonged deceleration greater than 3 minutes), FBS should not be undertaken and urgent preparations to expedite birth should be made.

Once the decision to deliver has been made, the aim should be to achieve delivery of the baby within 30 minutes (NICE, 2004)

- General anaesthesia is often used in this situation. Spinal anaesthesia is safer for the mother and may be appropriate in some emergency situations. The decision on mode of anaesthesia should be a joint decision resulting from discussion between the obstetrician and the attending anaesthetist.

- Following delivery, paired umbilical cord samples should be taken. Apgar scores should be calculated at 1 and 5 minutes. All results should be recorded in labour notes on eCare.

3.6 Fetal blood sample result (pH) Interpretation of the results

These results should be interpreted taking into account the previous pH measurement, the rate of progress in labour and the clinical features of the woman and baby.

Interpretation of results:

Use the classification of fetal blood sample results in the table shown below (NICE 2017)

Lactate(mmol/l)	pH	Interpretation
≤4.1	≥7.25	Normal
4.2-4.8	7.21-7.24	Borderline
≥4.9	≤7.20	Abnormal

Normal FBS result:

If the FBS is normal but there are no accelerations in response to fetal scalp stimulation/FBS, consider taking a second sample no more than 1 hour later, if the CTG continues to be abnormal.

Borderline FBS result:

If the FBS is borderline and there are no accelerations in response to fetal scalp stimulation/FBS, consider taking a second FBS no more than 30minutes if the CRG remains abnormal

OR sooner if additional non-reassuring or abnormal features are seen.

Abnormal FBS result:

Inform consultant with the aim of expediting delivery.

The time taken to take an FBS needs to be considered when planning

repeat samples. If CTG remains unchanged and the FBS result is stable after the second test, then a third /further sample may be deferred unless there are additional abnormalities on the CTG.

FAILED FBS:

If FBS has failed i.e. the fetal scalp will not bleed, insufficient sample or FBS machine not operating adequately AND no acceleration with fetal scalp stimulation, decide if the CTG is still abnormal, consideration for expediting delivery should be given and/or discussed with senior obstetrician.

3.7 Contraindications to FBS include:

- An acute event eg cord prolapse, suspected placental abruption or uterine rupture
- Sepsis/Intrapartum pyrexia >38C
- Maternal infection (e.g. HIV, hepatitis, herpes simplex virus)
- Prematurity (<34 weeks)
- Fetal bleeding disorders such as haemophilias
- Face/ brow presentation. Discuss with consultant if required for breech presentation
- Unbooked women (where the risk of maternal infection is not known)
- Where there is clear evidence of fetal compromise. E.g. prolonged deceleration > 3 minutes and not recovering by 9 minutes.
- Where a straightforward instrumental vaginal delivery is achievable

3.8 Record keeping:

- Record FBS procedure on partogram and CTG strip.
- Any events occurring during labour that may affect FHR should be contemporaneously noted in the maternal records and the Electronic Fetal Monitoring (EFM) record signed and date and time noted.
- The FBS results should be documented in eCare and onto the CTG. The blood gas monitor print out should be placed in the CTG envelope.

- The paired cord sample results should be documented in the labour record. The blood gas monitor print out should be placed in the CTG envelope.
- Following delivery, the caregiver should sign and note the date, time and mode of delivery on the EFM record

3.9 Blood Gas Analyser training

- The Point of Care Coordinator provides Blood Gas Analyser training upon request
- If the Blood Gas Analyser requires attention call the Biochemistry Department on 3406. There are engineers available 9am-5pm. Out of hours it may be fixed or the sample processed by an on-call biochemist.

3.10 Rationale for main recommendations

To ensure that the correct emergency response and effective communication has been adopted by staff who are dealing with a case of fetal blood scalp sampling.

3.11 When to inform consultant:

- After an abnormal FBS results
- If a third or subsequent FBS is required
- If FBS required in breech presentation
- Significantly raised base excess in the presence of normal pH
- Inability to obtain sample. E.g. high presenting part or cervix <4cm or no results from repeated attempts
- If woman objects to FBS

3.12 Common sources of error:

- Contamination of sample with maternal blood, liquor or air bubbles will lead to erroneous results (Liquor is alkaline and maternal blood may be acidic)
- Excessive caput succedaneum of fetal head may lead to a falsely low pH
- In the presence of intrauterine infection or placental abruption, FBS results may not reflect fetal condition.
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4.0 Statement of evidence/references

Statement of evidence:

References:

NICE (2020) Intrapartum care overview

NICE (2017) Intrapartum care for health women and babies

RCOG strat OG

Confidential Enquiry into Maternal and Child Health (CEMACH) (2005) Stillbirth, Neonatal and Post- Neonatal Mortality 2000-2003.

Neilson J P (2008) Fetal scalp sampling in labour. BMJ 2008 336: 1257-1258
NICE (2007) Intrapartum care. Care of healthy women and their babies during childbirth. London.

NICE (2004) Caesarean Section. Clinical Guideline. London: RCOG Press.

NICE guideline 2014 Fetal Monitoring

NMC (2008) the Code. Standards of conduct, performance and ethics for nurses and midwives. London.

NMC (2005) Guidelines for records and record keeping. London.

RCOG (2001) The use of electronic fetal monitoring. Evidence based clinical guideline number 8.

5.0 Governance

5.1 Document review history

Version number	Review date	Reviewed by	Changes made
4.2	09/2019		Appendix 2 – Removed FBS sticker and reference to it throughout the document as it is no longer used and it is recorded on eCare
4.2	09/2019		Appendix 2 – No longer use paper notes and records are documented on eCare

5.2 Consultation History

Stakeholders Name	Area if Expertise	Date Sent	Date Received	Comments	Changes Made
Joseph Nattey	Registrar	26/11/13			
Sanyal Patel	Registrar	19.1.17		Yes	No
Matrons			May 2017	No comments	Yes
Head of Midwifery			May 2017	No comments	Yes
Consultant Midwife and Matrons			May 2017	No comments	Yes
Consultants			May 2017	No comments	Yes
Registrars/SHO and Midwives			May 2017	No comments	Yes
Clinical Governance Facilitator			May 2017	No comments	Yes
Guideline review group meeting			20/09/2019	Updated at meeting in relation to FBS sticker and eCare.	Yes
Fiona Lewis	Consultant	02/10/20			

5.3 Audit and monitoring

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board
Clinical practice	A) Statistics B) Generated risk forms	Risk Midwife	Annually	Labour Ward Forum

5.4 Equality Impact Assessment

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

Equality Impact Assessment			
Division		Department	
Person completing the EqIA		Contact No.	
Others involved:		Date of assessment:	
Existing policy/service		New policy/service	

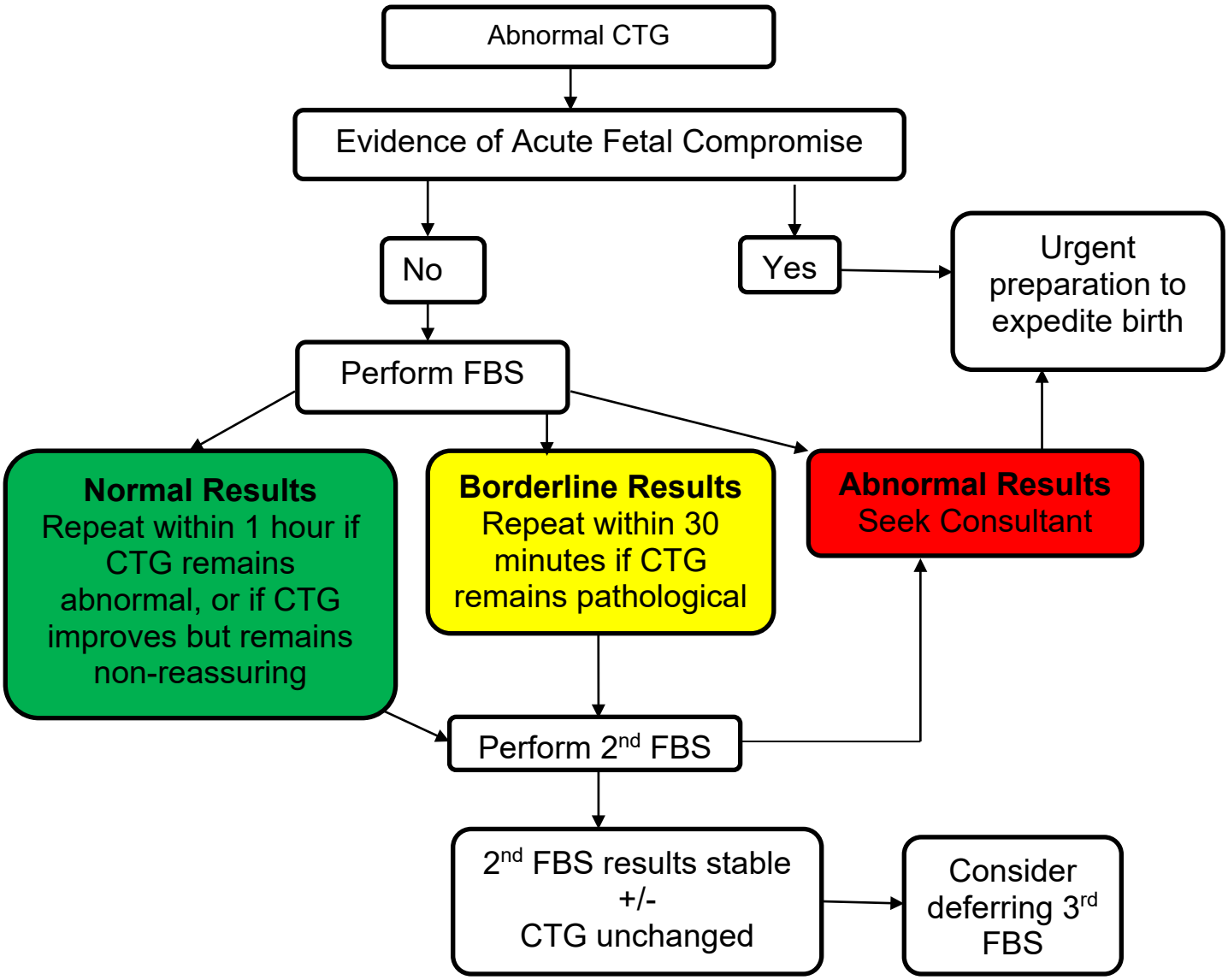
Will patients, carers, the public or staff be affected by the policy/service?	Yes
If staff, how many/which groups will be affected?	*For example: community midwives, phlebotomists, all staff*

Protected characteristic	Any impact?	Comments
Age	YES NO	Positive impact as the policy aims to recognise diversity, promote inclusion and fair treatment for patients and staff
Disability	YES NO	
Gender reassignment	YES NO	
Marriage and civil partnership	YES NO	
Pregnancy and maternity	YES NO	
Race	YES NO	
Religion or belief	YES NO	
Sex	YES NO	
Sexual orientation	YES NO	

What consultation method(s) have you carried out?
For example: focus groups, face-to-face meetings, PRG, etc
How are the changes/amendments to the policies/services communicated?
For example: email, meetings, intranet post, etc
What future actions need to be taken to overcome any barriers or discrimination?

What?	Who will lead this?	Date of completion	Resources needed
Review date of EqIA			

Appendix 1: Fetal blood sampling Algorithm



If 3rd FBS Required – refer to Consultant

Documentation in eCare

- Time FBS taken
- FBS results
- Consultant advised if abnormal results
- Time of planned repeat
- 2nd FBS results
- 3rd FBS required? – Consultant opinion/ referral
- 3rd FBS results
- Paired Cord sample results

Where FBS performed, always take paired cord sample following delivery