Fetal Monitoring Policy

Title	NHS Borders Fetal Monitoring Guideline
Document Type	Guideline
Document Number	WCH030
Version Number	02
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Issue date	01/09/2015
Review date	01/09/2020
Distribution	Midwives and Obstetricians
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An audit will be undertaken in January 2016 to rev iew the implementation and compliance of this policy.	

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1. Introduction

Electronic Fetal Monitoring (EFM) with a cardiotocograph (CTG) should be the preferred and recommended method of monitoring of the fetal heart in labour for high risk women. Intermittent Auscultation (IA) with a Doppler device or Pinard stethoscope should be the preferred and recommended method of monitoring of the fetal heart in labour for low risk women. This document is based on the recommendations of the National Institute for Health and Care Excellence NICE guideline CG190 (NICE 2014).

Qualified professionals should receive regular training on the interpretation and documentation relating to EFM or IA.

2. Purpose

The main purpose of this policy is to give guidance to staff on the monitoring of the fetal heart in the antenatal period and for women in labour. It also includes guidance in the antenatal period

The most appropriate form of monitoring should be discussed with the woman to enable the woman to make informed choices regarding the method of monitoring. Due consideration must be given to maternal preference in addition to potential risk factors for both mother and baby.

3. Definitions

IA	Intermittent Auscultation
CTG	Cardiotocograph
EFM	Electronic Fetal Monitoring
FHR	Fetal Heart Rate
FBS	Fetal Blood Sample
ARM	Artificial rupture of membranes
PROM	Prolonged Rupture of Membranes

4. Duties

The on call Consultant Obstetrician is responsible for the overall care of the high risk woman.

The on call Obstetric Registrar or Assisted Birth Practitioner Midwife are responsible for the clinical management of the high risk woman, escalating any concerns to the obstetric consultant for an opinion or consultation.

The coordinator in charge of labour ward is responsible for having an awareness of the management and progress of all women on labour ward, prioritising concerns identified by midwives and escalating appropriately to the Assisted Birth Practitioner

Midwife, the on call registrar and consultant. She will also ensure that 'fresh eyes' is undertaken hourly by the designated person, where continuous monitoring is in place. The midwife is responsible for the care of antenatal/labouring woman, escalating any concerns to the labour ward coordinator, the Assisted Birth Practitioner Midwife and on call registrar

5. Antenatal EFM

Complete CTG label and attach at commencement of CTG.
When CTG discontinued, date and sign CTG.
Complete a 'Fresh Eyes' label including 2 signatures and place in SWHMR. It is recommended that the CTG paper trace is reviewed in the room in labour ward and not from the consol at the midwives station.

6. Intrapartum Care

The type of monitoring recommended will be dictated by the antenatal or intrapartum risk factors identified and a thorough assessment of a woman's medical and obstetric history should be undertaken. The NICE guidelines (NICE 2014) should be used to aid assessment of risk factors which necessitate continuous monitoring.

6.1 Admission of the Low Risk woman in Labour

For women categorised as 'low risk' with an uncomplicated pregnancy, current evidence does not support the use of an admission CTG and it is therefore not recommended (NICE 2014).

During the admission assessment, the fetal heart should be auscultated for a minimum of one minute immediately after a contraction and recorded as a single rate. The maternal pulse must be palpated to differentiate between maternal and fetal heart rate and recorded on the admission page of the labour record.

If continuous CTG has been used because of concerns arising from intermittent auscultation but there are no non- reassuring abnormal features on the CTG trace after 20 minute, remove the CTG and return to intermittent auscultation.

Offer telemetry to any woman who needs continuous monitoring during labour, and facilitate a woman's choice of positioning during monitoring.

In the 1st stage of labour the fetal heart should be auscultated after a contraction for a least one minutes, every 15 minutes and documented on the partogram in the labour record.

In the 2nd stage of labour the fetal heart should be auscultated after a contraction for at least 1 minute, every 5 minutes and documented on the partogram in the labour record.

The maternal pulse should be palpated hourly throughout the 1st and 2nd stages of labour and documented on the partogram in the labour record. If a fetal heart rate

abnormality is detected the maternal pulse should be palpated to differentiate the maternal and fetal heart rates.

6.1.2 Transfer from intermittent auscultation to continuous EFM.

Base any decisions about transfer of care on clinical findings and discuss with the woman and her companion the reasons for this and allay any anxiety. Indication for transfer from intermittent auscultation to continuous EFM, include;

Significant meconium stained liquor
Fetal heart <110 bpm or greater than 160 bpm, or a deceleration noted
Maternal pyrexia (38.0 once or 37.5 twice two hours apart)
Maternal tachycardia
Suspected chorioamnionitis or sepsis
Fresh bleeding that develops in labour
Oxytocin use
Woman's request
History of reduced fetal movement
Epidural analgesia

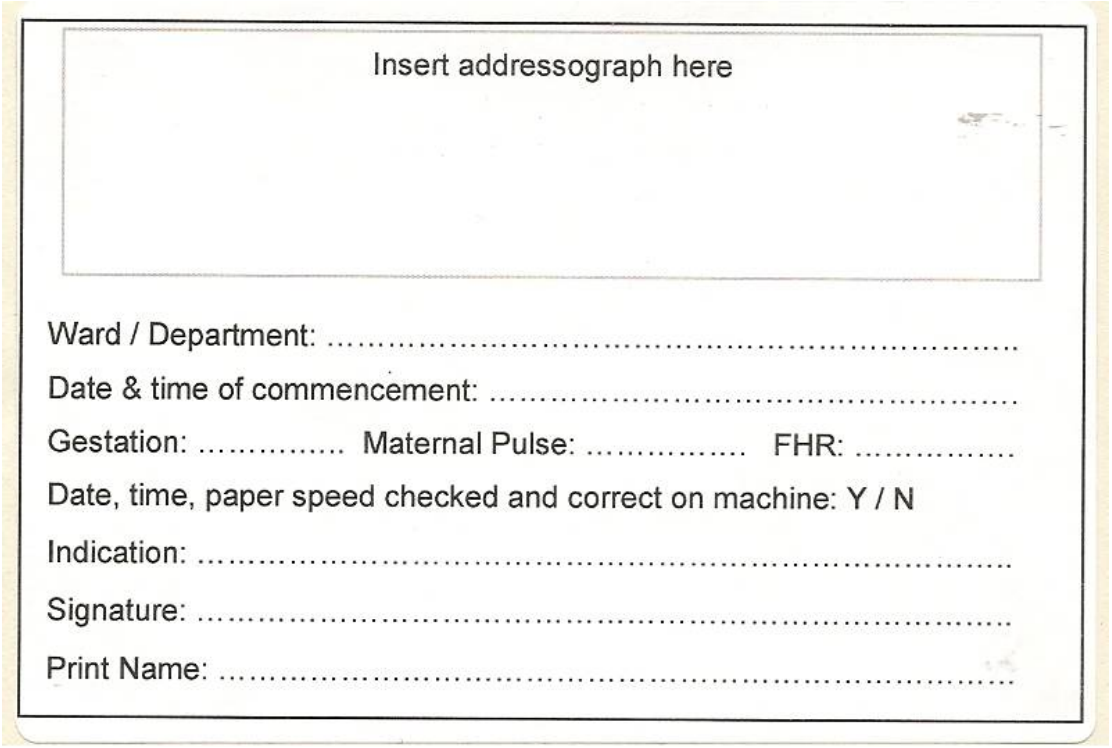
6.2 High risk women – Intrapartum Care

The NICE guidelines recommend continuous monitoring for high risk groups when in active labour, see below;

Maternal Risk Factors	**Fetal Risk Factors**
Previous caesarean section	IUGR
Raised blood pressure	Prematurity <37 weeks gestation
Post term >42 weeks	Abnormal Doppler studies
Oligohydramnios	Meconium stained liquor
Polyhyrdamnios	Multiple pregnancy
Prolonged rupture of membranes >24 hrs	Transverse or oblique lie
Delay in the first or second stage of labour	Breech Presentation
Diabetes	
Antenatal haemorrhage	
Maternal medical disease	

6.3 Care of the woman having EFM

Attach CTG label at commencement of CTG.



Palpate and record maternal pulse at commencement of EFM and hourly during labour.

Record Interpretation of CTG hourly utilising the NICE criteria and 'Interpretation' label. Utilise a 'Fresh Eyes' review hourly by the designated person.

The Assisted Birth Practitioner and coordinator must be informed of any abnormal features following a 'fresh eyes' review and ensure that the actions are followed through to resolution.

Mark significant intrapartum events on the CTG e.g.

Analgesia	CTG Review
Oxytocin	Pyrexia
Position Change	Epidural
FSE application	
FBS	

If the quality of the CTG recording is unsatisfactory, adjust the tocograph or transducer. If necessary apply a FSE with maternal consent to ensure accurate recording of the FHR.

If the CTG is discontinued and then recommenced, a new CTG label must be completed and placed at the start of the new trace.

6.4 Interpretation of Antenatal/Intrapartum CTG

Use the 'Fresh Eyes' label and NICE guideline to define and interpret the CTG.

Description and features of FHR trace	**Baseline (bpm)**	**Variability (bpm)**	**Decelerations**	**Accelerations**
Normal/Reassuring / Ante-natal	100–160	5 or more	None	Present
Normal Reassuring / Intrapartum	100-160	5 or more	None or Early	
Non-reassuring	161–180	Less than 5 for 30–90 minutes	**Variable decelerations** -dropping from baseline by 60 bpm or less **and** taking 60 seconds or less to recover. -present for over 90mins. -occurring with over 50% of contractions **OR** **Variable decelerations -** -dropping from baseline by **more** than 60 bpm **or** taking over 60 seconds to recover - present for over 30mins -occurring with over 50% contractions **OR** **Late Decelerations** -present for up to 30 mins, - occurring with over 50% of contractions	
Abnormal	Above 180 **OR** Below 100	Less than 5 for over 90mins	**Non- reassuring variable decelerations** (see above row) -still observed 30 mins after conservative measures -occurring with over 50% of contractions **OR** **Late Decelerations** -present for over 30 mins. -do not improve with conservative measures -occurring with over 50% of contractions **OR** **-Bradycardia or single prolonged deceleration lasting 3 mins or more**	

Category	Definition
CTG is Normal /reassuring	All **4** features are normal for antenatal CTG All **3** features are normal/reassuring for intrapartum CTG
CTG is Non-reassuring	**1** feature is non-reassuring and **2** normal/reassuring features
CTG is Abnormal	1 abnormal **OR 2** non-reassuring features

6.4.1Principles for CTG interpretation

Antenatal

When reviewing the CTG trace, assess and document all 4 features (baseline fetal heart rate, variability, presence or absence of decelerations, presence of accelerations.

Intrapartum

Assess and document all 3 features as above and supplement ongoing care with a documented systematic assessment of the condition of the mother and CTG every hour. If there are concerns about CTG findings undertake the assessment more frequently.

It is **not** possible to categorise or interpret every CTG trace. **Senior obstetric input is important in these cases.**

6.4.2 Baseline Fetal Heart Rate Guidance

The fetal heart rate will usually be between 110 and 160 beats per minute (bpm)
A baseline fetal heart rate between 100 and 109bpm with normal baseline variability and no variable or late decelerations is normal.

A stable baseline fetal heart rate between 90 and 99 bpm with normal baseline variability maybe a normal variation, if uncertain obtain a senior opinion

If the baseline fetal heart rate is between 161 and 180bpm with no other non-reassuring or abnormal features on the CTG, think about underlying causes such as infection and start one or more conservative measures. (See recommendation 6.7)

If the baseline fetal heart rate is between 161-180bpm with no other non –reassuring or abnormal features on CTG and the women's temperature and pulse are normal, continue CTG and normal care

If the baseline fetal heart rate is between 100 and 109bpm or above 160bpm and there is 1 other non reassuring features on the CTG start conservative measures. Inform the coordinating midwife, Assisted Birth Practitioner Midwife or Obstetrician when conservative measures are implemented.

If the baseline fetal heart rate is above 180bpm with no other reassuring or abnormal features think about possible causes and start one or more conservative measures. Consider fetal blood sampling to measure PH or lactate if the rate stays above 180bpm despite conservative measures. Inform the coordinating midwife, Assisted Birth Practitioner Midwife or Obstetrician when conservative measures are implemented.

If there is a bradycardia or single prolonged deceleration with the fetal heart rate below 100bpm for 3 mins or more start conservative measures, seek urgent obstetric help and make preparations for an urgent birth. Expedite the birth if the bradycardia persists for 9 mins. If the fetal heart rate recovers at any time up to 9 mins reassess any decision made.

6.4.3 Baseline Variability

Baseline variability will usually be 5 bpm or more and intermittent periods of reduced variability are normal especially during periods of sleep. Mild or minor pseudo-sinusoidal patterns are of no significance.

If there is reduced baseline variability of less than 5bpm with a normal baseline and no variable or late decelerations, start conservative measures if this persists over 30 minutes. If it persists for over 90 mins offer fetal blood sampling.

If there is reduced variability of less than 5 bpm for over 30 mins together with 1 or more of tachycardia (over 160bpm) a baseline fetal heart rate below 100bpm or variable or late decelerations, start conservative measures and offer fetal blood sampling.

6.4.5 Decelerations

When describing decelerations it is important to note the depth, duration, and timing in relation to the peak of the contraction. Whether or not the fetal heart rate returns to the baseline, how long they are present for and whether they occur with over 50% of contractions.

Decelerations should be described as ‘early’, ‘variable’, or ‘late’

Early decelerations are uncommon, benign and usually associated with head compression and with no non-reassuring or abnormal features on the CTG should not prompt further action

Variable decelerations that begin with the onset of a contraction are common, can be a normal feature in an uncomplicated labour and birth, and are usually a result of cord compression. If the baseline drops by 60bpm or less **and** taking 60 seconds or less to recover, present for **over 90 mins** and occurring for over 50% contractions start conservative measures.

Variable decelerations that are observed with a normal baseline fetal heart rate and variability and the baseline drops by more than 60bpm **or** takes **over** 60 seconds to recover, present for up to **30** mins and occurring with over 50% contractions start conservative measures.

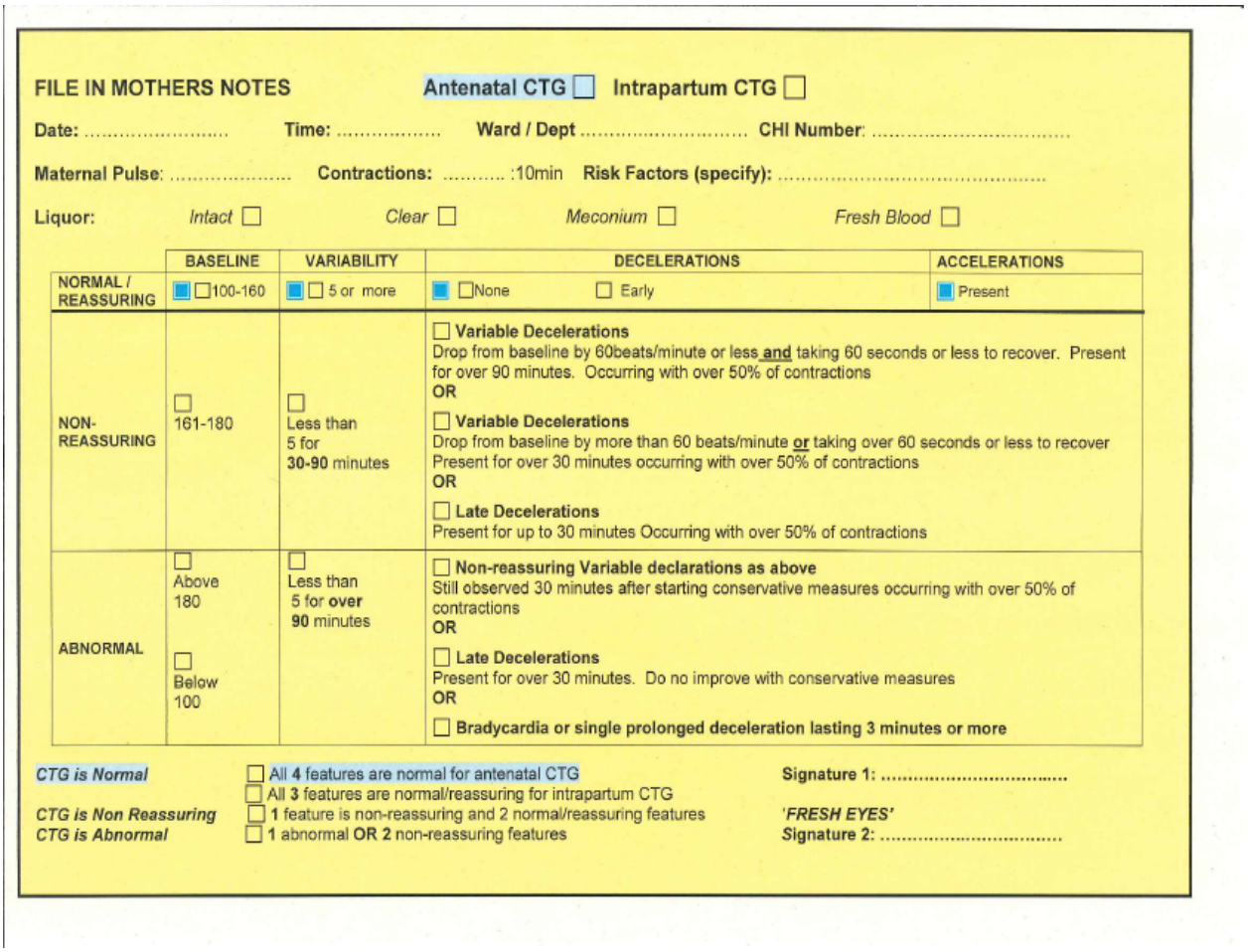
Offer fetal blood sampling if non- reassuring variable decelerations that have been observed for 30 mins after conservative measures, accompanied by tachycardia (>160bpm) and/or reduced variability (<5bpm).

Late decelerations usually start after a contraction and often have a slow return to baseline. Start conservative measures, offer fetal blood sampling, expedite the birth if the late decelerations persist for over 30 minutes and occur with over 50% of the contractions. If the baseline variability and fetal heart rate is abnormal immediate action must be taken sooner than 30 minutes

6.4.5 Accelerations

The presence of fatal heart rate accelerations is generally a sign that the unborn baby is coping with labour. If a fetal blood sample is indicated and the sample cannot be obtained, but the associated scalp stimulation results in the fetal heart rate accelerations, decide whether to continue the labour or expedite the birth in light of the clinical circumstances and in discussion with the woman.

6.5 Use of 'Fresh Eyes' system. (NEW)



FILE IN MOTHERS NOTES Antenatal CTG ☐ Intrapartum CTG ☐

Date: ..... Time: ..... Ward / Dept ..... CHI Number: .....

Maternal Pulse: ..... Contractions: ..... :10min Risk Factors (specify): .....

Liquor: *Intact* ☐ *Clear* ☐ *Meconium* ☐ *Fresh Blood* ☐

	BASELINE	VARIABILITY	DECELERATIONS	ACCELERATIONS
NORMAL / REASSURING	☐ 100-160	☐ 5 or more	☐ None ☐ Early	☐ Present
NON-REASSURING	☐ 161-180	☐ Less than 5 for **30-90** minutes	☐ **Variable Decelerations** Drop from baseline by 60beats/minute or less **and** taking 60 seconds or less to recover. Present for over 90 minutes. Occurring with over 50% of contractions **OR** ☐ **Variable Decelerations** Drop from baseline by more than 60 beats/minute **or** taking over 60 seconds or less to recover Present for over 30 minutes occurring with over 50% of contractions **OR** ☐ **Late Decelerations** Present for up to 30 minutes Occurring with over 50% of contractions	
ABNORMAL	☐ Above 180 ☐ Below 100	☐ Less than 5 for **over 90** minutes	☐ **Non-reassuring Variable declarations as above** Still observed 30 minutes after starting conservative measures occurring with over 50% of contractions **OR** ☐ **Late Decelerations** Present for over 30 minutes. Do no improve with conservative measures **OR** ☐ **Bradycardia or single prolonged deceleration lasting 3 minutes or more**	

CTG is Normal ☐ All **4** features are normal for antenatal CTG
☐ All **3** features are normal/reassuring for intrapartum CTG

CTG is Non Reassuring ☐ **1** feature is non-reassuring and 2 normal/reassuring features

CTG is Abnormal ☐ **1** abnormal **OR 2** non-reassuring features

Signature 1: .....

'FRESH EYES'

Signature 2: .....

A Fresh Eyes review should be undertaken hourly. The second signatory must be at least a band 6 midwife or registrar. The Fresh Eyes label is completed by the caring midwife and countersigned and then placed in the labour record. If the 'fresh eyes' reviewer is not available, the review should take place as soon as possible and the reason for delay documented. The 'fresh eyes' sticker should be signed following review of the CTG paper trace and not from the consol at the midwives station

6.6 Management based on interpretation of cardiotocograph traces

Table 11 Management based on interpretation of cardiotocograph traces

Category	Definition	Interpretation	Management
CTG is normal/ reassuring	All 3 features are normal/ reassuring	Normal CTG, no non-reassuring or abnormal features, healthy fetus	• Continue CTG and normal care. • If CTG was started because of concerns arising from intermittent auscultation, remove CTG after 20 minutes if there are no non-reassuring or abnormal features and no ongoing risk factors.
CTG is non- reassuring and suggests need for conservative measures	1 non-reassuring feature **AND** 2 normal/ reassuring features	Combination of features that may be associated with increased risk of fetal acidosis; if accelerations are present, acidosis is unlikely	• Think about possible underlying causes. • If the baseline fetal heart rate is over 160 beats/minute, check the woman's temperature and pulse. If either are raised, offer fluids and paracetamol. • Start 1 or more conservative measures: - encourage the woman to mobilise or adopt a left-lateral position, and in particular to avoid being supine - offer oral or intravenous fluids - reduce contraction frequency by stopping oxytocin if being used and/or offering tocolysis. • Inform coordinating midwife and obstetrician.
CTG is abnormal and indicates need for conservative measures AND further testing	1 abnormal feature **OR** 2 non-reassuring features	Combination of features that is more likely to be associated with fetal acidosis	• Think about possible underlying causes. • If the baseline fetal heart rate is over 180 beats/minute, check the woman's temperature and pulse. If either are raised, offer fluids and paracetamol. • Start 1 or more conservative measures (see 'CTG is non-reassuring…' row for details). • Inform coordinating midwife and obstetrician. • Offer to take a FBS (for lactate or pH) after implementing conservative measures, or expedite birth if an FBS cannot be obtained and no accelerations are seen as a result of scalp stimulation • Take action sooner than 30 minutes if late decelerations are accompanied by tachycardia and/or reduced baseline variability. • Inform the consultant obstetrician if any FBS result is abnormal. • Discuss with the consultant obstetrician if an FBS cannot be obtained or a third FBS is thought to be needed.
CTG is abnormal and indicates **need for urgent intervention**	Bradycardia or a single prolonged deceleration with baseline below 100 beats/minute, persisting for 3 minutes or more*	An abnormal feature that is very likely to be associated with current fetal acidosis or imminent rapid development of fetal acidosis	• Start 1 or more conservative measures (see 'CTG is non-reassuring…' row for details). • Inform coordinating midwife • Urgently seek obstetric help • Make preparations for urgent birth • Expedite birth if persists for 9 minutes • If heart rate recovers before 9 minutes, reassess decision to expedite birth in discussion with the woman.

Abbreviations: CTG, cardiotocography; FBS, fetal blood sample.

* A stable baseline value of 90–99 beats/minute with normal variability may be a normal variation (having confirmed that this is not the maternal heart rate); obtain a senior obstetric opinion if uncertain.

Intrapartum care: NICE guideline CG190 (December 2014).

The management sheet above suggests conservative measures in the event of a non-reassuring CTG. This sheet along with a the 'fresh eyes' sticker has been laminated to A4 size for quick reference and placed in all CTG machines throughout the unit.

6.7 Conservative measures:

- adopt the left lateral position and avoid being supine
- offer oral or intravenous fluids
- offer paracetamol if raised temperature
- stop oxytocin
- offer tocolytic drug, subcutaneous terbutaline 0.25mg if hyperstimulating
- Do not use maternal facial oxygen therapy for intrauterine resuscitation, use for maternal indications.
- In the presence of fetal bradycardia associated with a hypotensive episode following epidural insertion or top-up; inform the anaesthetist, infuse rapidly up to 500 mls of Hartmann's solution, and reposition the woman into the left lateral position..
- Urgently inform the coordinating midwife/Assisted Birth Practitioner Midwife, request the registrar to attend and conduct a full assessment of the CTG in conjunction with the clinical picture.
- Fetal blood sampling should be considered in the presence of a non-reassuring or abnormal CTG unless there is clear evidence of acute fetal compromise
- If acute fetal compromise is suspected or confirmed, delivery should aim to be accomplished within a time framework appropriate for the clinical condition.
- Prepare the woman for transfer to theatre.

6.8 Action to be taken in the presence of a non-reassuring CTG in 1st stage of labour.

- If the CTG is classified as non-reassuring the labour ward coordinator / Assisted Birth Practitioner Midwife and obstetrician should be asked to review the CTG and a plan of care documented.
- If the CTG is classified as abnormal the labour ward coordinator /Assisted Birth Practitioner Midwife/obstetrician must review and document the ongoing plan of care.
- Fetal Blood sampling (FBS) should be used where appropriate unless contraindicated or technically difficult (NICE 2014).
- The concerns should be explained and a plan of care discussed with the woman and her companion

6.9 Actions to be taken in the presence of an abnormal CTG in 2nd stage of labour.

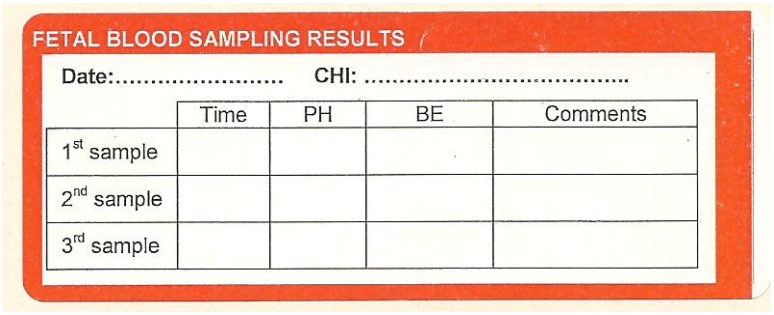
If the CTG is classified as abnormal or a fetal bradycardia of >3 minutes occurs immediately inform the coordinator/ Assisted Birth Practitioner Midwife and registrar. Prepare the woman for an expedited delivery.

7.0 Fetal Blood Sampling (FBS)

- Explain to the woman why the test is being advised, the procedure and the outcome of the test. Consent must be obtained.
- FBS should be considered in response to a non-reassuring / abnormal CTG when planning ongoing management for labour / delivery.
- When performing FBS the woman should ideally be positioned in the left lateral.
- Do not carry out FBS if any contraindications are present, including risk of maternal-to-fetal transmission of infection, risk of fetal bleeding disorders, maternal infection, prematurity and Hep B/HIV.
- Following a normal FBS result, offer repeat FBS no more than 1 hour later if still indicated or sooner if additional non reassuring or abnormal features are seen.
- Following a borderline result sampling offer repeat sampling no more than 30mins later or sooner if additional non reassuring or abnormal features are seen
- The time taken to repeat FBS needs to be considered when planning repeat samples.
- If the FHR remains unchanged and the FBS result is stable after the second test, further sampling may be deferred unless additional non-reassuring or abnormal features are seen.
- Where there is clear evidence of acute fetal compromise, FBS should not be undertaken and urgent preparation to expedite delivery should be made which may include initiating ‘category 1 - red’ emergency procedures.
- When interpreting A FBS result take into account any previous lactate or PH measurement, the rate of progress in labour and the clinical features of the woman and baby.
- Discuss with the consultant if a FBS cannot be obtained or a third fetal blood sample is indicated
- If a FBS is indicated and cannot be obtained, but the associated scalp stimulation results in fetal heart rate accelerations, in discussion with the consultant decide if labour should continue or the expedite the birth.
- If a FBS is indicated and a sample cannot be obtained and no improvement in the CTG trace, advise the woman that the birth should be expedited.

7.1 Documentation of FBS results

The FBS result sticker must have the date, woman's CHI number and placed in the labour notes, and a plan of care should be documented


FETAL BLOOD SAMPLING RESULTS

Date:..... CHI: .....

	Time	PH	BE	Comments
1st sample				
2nd sample				
3rd sample				

7.2 The Classification of FBS results (NICE 2014)

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

8.0 Post Delivery Cord Blood Gas Analysis

NICE guidelines recommend that paired cord blood samples are taken (arterial and venous). Cord blood gas analysis should be performed after every delivery and the results must be transcribed into the labour record.

9.0 Storage of CTG Traces

Antenatal CTGs should be filed on the standard mount sheet in the maternity case notes.
Intrapartum CTGs should be store in the CTG envelope in the maternity case notes.
CTG traces are kept for a minimum of 25 years.
Trium system automatically archives CTG recordings upon completion.
CTG traces must remain in the maternity case notes at all times.

10.0 References

NICE 2014 Clinical Guideline Intrapartum Care CG190 (December 2014).
[available from www.nice.org]