Aneurin Bevan University Health Board

Fetal Monitoring Guideline

Intermittent Auscultation and Electronic Fetal Monitoring

N.B. Staff should be discouraged from printing this document. This is to avoid the risk of out of date printed versions of the document. The Intranet should be referred to for the current version of the document.

Status: Issue 3 | Issue date: November 2020
Approved by: Clinical Effectiveness Forum | Expiry date: November 2023
Owner: Maternity Services | Policy Number: ABHB/Clinical Maternity/0147

Contents:

Executive Summary

Auscultation of the fetal heart forms part of fetal surveillance. Its aim in labour is to detect those babies who may be compromised or potentially compromised by a shortage of oxygen (fetal hypoxia). If the shortage of oxygen is both prolonged or severe, babies are at risk of being born with a disability or of dying either during labour or shortly after (Alfirevic et al 2007)

For a woman who is healthy and has had an otherwise uncomplicated pregnancy, intermittent auscultation (IA) should be offered and recommended in labour to monitor fetal wellbeing,

However, cardiotocography - continuous electronic fetal monitoring (EFM) is recommended where there are risk factors identified during the initial assessment or arise during the labour and for high risk pregnancies.

Aims
Aneurin Bevan Health Board demonstrates a standardised approach to the use and interpretation of intermittent auscultation of the fetal heart and electronic fetal monitoring.

1 Fetal Monitoring

- Intermittent auscultation of the fetal heart should be undertaken at routine antenatal assessments after 24 weeks gestation.

- Women must be included in the decisions around the method of fetal monitoring. The principles of informed choice must be employed and the woman's decision respected.

Monitoring and Assessment in labour

Offer intermittent auscultation of the fetal heart rate to women at low risk of complications in established labour.

- A full risk assessment of the woman should be undertaken in the first instance to assess the suitability of using IA to monitor the fetal heart.

- Either use a pinnard or Doppler ultrasound, (documenting which device used).

- Enquire and record the presence of fetal movements

- Auscultate the fetal heart for a minimum of 1 minute immediately after a contraction, every 15 minutes in the first stage of labour and record it as a single rate. This should be increased to every 5 minutes during the second stage of labour.

- Auscultate the fetal heart again when the heart rate should be expected to be 15 beats more than the baseline, indicating acceleration with the fetal movement. Record this.

- If fetal movement was felt, the fetal heart accelerated with fetal movement and there was no deceleration with or after the contraction, this indicates good fetal health and the mother can be reassured. Record this.

- Palpate the maternal pulse hourly, or more frequently if there are concerns to differentiate between maternal and fetal heart rate.

- Record acceleration and deceleration if heard.

- Attention should be given to identification of a rising baseline, presence of decelerations and absence of accelerations. Where there is suspicion that the baseline has risen this would warrant increased auscultation of the fetal heart. If confirmed transfer to continuous monitoring.

- If CTG has been commenced due to suspected fetal heart rate abnormalities this can be discontinued if the recording is normal after 20 minute.

Transferring from intermittent auscultation to continuous CTG

If any of the risk factors are present at the initial assessment of labour or arise during labour then the woman should be advised to transfer to obstetric led care and receive continuous CTG.

- Pulse over 120 beats/minute on 2 occasions 30 minutes apart
- A single reading of either raised diastolic blood pressure of 110 mmHg or more or raised systolic blood pressure of 160 mmHg or more.
- Either raised diastolic blood pressure of 90 mmHg or more or raised systolic blood pressure of 140 mmHg or more on 2 consecutive readings taken 30 minutes apart.
- A reading of 2+ of protein on urinalysis and a single reading of either raised diastolic blood pressure (90mmHg or more) or raised systolic blood pressure (140 mmHg or more)
- A temperature of 38’c or above on a single reading or 37.5’c or above on 2 consecutive readings 1 hour apart.
- Fresh vaginal bleeding

- Rupture of membranes more than 24 hours before the onset of established labour
- The presence of meconium, : If CTG concerns refer to an obstetrician for transfer to obstetric led care.
- Pain reported by the woman that differs from pain of contractions.
- Suspected chorioamnionitis or sepsis
- Risk factors that indicate the need for obstetric led care
- Abnormal presentation
- Fetal complications of pregnancy such as small for gestational age fetus, macrosomia, oligohydramnious/polyhydramnious.
- Fetal heart rate above 160 bpm or below 110 bpm.
- A rising baseline rate or decelerations
- Reduced fetal movements in the last 24 hours reported by the woman.
- Confirmed delay in the first or second stage of labour. Do not regard amniotomoy alone for suspected delay in established first stage of labour as an indication to commence continuous CTG

Address any concerns that the woman has about continuous CTG and give her the following information:-

- Explain that continuous CTG is used to monitor the baby's heartbeat and the labour contractions
- Explain that a normal trace is reassuring and indicates that the baby is coping well with labour.
- Explain that it may restrict her mobility
- Explain that changes to the baby’s heart rate during labour are common and do not necessarily cause concern.
- Explain that decisions about her care during labour and birth will now be based on an assessment of several factors, including her preferences, her condition and that of her baby, as well as the findings from CTG.

2) Electronic Fetal Monitoring

Electronic fetal monitoring is used in the following: –

- Any woman after 28 weeks gestation requiring an assessment at DAU or Triage (see DAU and Triage guidelines): women admitted to Dau and triage with RFM below 28/40 are not routinely offered CTG monitoring.

- For woman between 26 weeks gestation and 28 weeks gestation requiring admission to an antenatal ward, senior obstetric review is required for decision on use of EFM.

- Women assessed as being high risk and booked for Obstetric led care (OLC) will require continuous EFM once in established labour and where there is a risk factor for fetal compromise

- Women transferred to from midwife led to obstetric led care in labour.

The professional undertaking EFM:

- Performs a risk assessment and documents the indication for undertaking EFM on the CTG sticker placed on the start of the CTG paper and on the CTG interpretation stickers to be used in the notes.

- Discusses the need for EFM with the woman and gains her verbal consent. Explains to the woman, the process of obtaining an EFM recording.

- Women should be informed that EFM will restrict their mobility in labour (NICE 2007). However, women should be encouraged to adopt various positions such as sitting on a chair, standing or using a birth ball. All members of the multi-disciplinary team should encourage and promote this practice.

- Ensures EFM monitor is clean, fully equipped and correct EFM tracing paper is used. Paper speed should be 1cm/minute.

- EFM monitor must be checked to ensure the date and time clocks are correctly set. Any inaccuracies must be rectified or the machine taken out of use.

- Performs an abdominal palpation.

- Auscultates the fetal heart rate using a Pinard stethoscope in the first instance, however in certain circumstances e.g. raised BMI, use of a Doppler is acceptable. The maternal pulse is palpated simultaneously with the fetal heart rate in order to differentiate between the two. Maternal pulse must be documented.

Affix CTG/EFM label to beginning of trace, containing the following information:

- Woman's name
- Case note number
- Date of trace
- Time commenced
- Maternal pulse
- Pinnard auscultation
- Indication for EFM
- Name of midwife
- Clear, legible signature of Midwife
- Estimated date of delivery

Ensure the CTG machine is operating correctly i.e. paper moving freely and sitting correctly on rollers, tracing clear and readable.

Settings on CTG machines should be standardised so that

- Paper speed is set to 1 centimetre per minute
- Sensitivity displays are set to 20 beats per minute (bpm/cm)
- FHR range displays of 50-210 bpm are used

Ensure toco pressure is correctly set to 10 to 15 (Some CTG monitors automatically reset this at 20)

All staff changeover of care should be noted on the trace with a clear legible signature.

Ensure the mother's comfort, avoiding aorto-caval compression. Enquire as to latex allergy, it is preferable to use single use non latex straps. The toco transducer needs to sit on top of the fundus for optimal tracing. Straps should be correctly secured.

Systematic CTG assessment

Make a documented systematic assessment of the condition of the woman and the unborn baby (including CTG findings) hourly, or more frequently if there are concerns

Do not make any decision about a woman's care in labour on the basis of cardiotocography (CTG) findings alone.

Take into account any antenatal and intrapartum risk factors, the current wellbeing of the woman and unborn baby, and the progress of labour when interpreting the CTG trace.

Remain with the woman at all times in order to continue providing one-to-one support.

Ensure that the focus of care remains on the woman rather than the CTG trace.

All women requiring continuous electronic fetal monitoring must undergo a regular assessment with additional fresh eyes and clear documentation of findings. This review will be performed by the midwife responsible for care and fresh eyes undertaken by another midwife or obstetrician (ST3 or above) within a maximum period of two hours. The assessment of maternal and fetal risk factors must include documentation on:

Maternal: Contractions, Maternal Pulse, Cervical Dilatation, Reason for CTG

Fetal: Liquor Colour (if known), Gestation, CTG Baseline, Variability, Accelerations, Decelerations (as per FIGO)

Decision: Date and Time of Fresh Eyes, Signature, and Status of Assessor, Classification of CTG and Action Taken

Review: Date and Time of Fresh Eyes, Signature and Status of Assessor and if agreements with Review and Action

A review of previous CTG is an important factor to identify any changes including that of the baseline rate.

Principles for intrapartum CTG trace interpretation

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

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

Accelerations

The presence of fetal heart rate accelerations is generally a sign that the unborn baby is healthy

If there is a stable baseline fetal heart rate between 110 and 160 beats/minute and normal variability, continue usual care as the risk of fetal acidosis is low.

Documentation

Any event that may affect the FHR should be noted contemporaneously on the EFM trace and case notes. (e.g. vaginal examination, siting of epidural, drugs) Care must be taken to avoid obscuring the recorded features. Where there is the facility to record these events electronically on the CTG paper this should be used instead of writing on the paper (newer CTG machines have this facility)

ALL CTG recordings should be documented in the woman's notes using the appropriate interpretation sticker. This method should always be used by all obstetricians and midwives.

During labour, formal assessment of the fetal heart rate should be undertaken hourly and the assessment clearly documented in the notes using the CTG sticker.

In addition, during labour, a continuous CTG recording should be reviewed by another midwife or obstetrician on an hourly basis. This is referred to as the "fresh eyes" approach. It can be undertaken by any grade of midwife or doctor. It is not a referral to a more senior midwife or obstetrician but an opportunity for a colleague to provide a fresh assessment to the CTG. This should be regarded as an opportunity for effective team working and the promotion of continuous CTG assessment skills.

It is essential that the CTG sticker is signed and the name of the professional printed legibly. This applies to the professional caring for the woman and the professional providing the fresh eyes assessment.

A clear action plan must be documented.

All findings should be explained to the woman. Where appropriate, consider the use of interpretation services.

On completion of an antenatal CTG trace, it should be signed and reason for discontinuation documented. A portion of blank paper should be left at the end of the trace before tearing it off. The trace should then be stored in a CTG wallet and securely stored within the notes.

STAN should be considered and used in all high risk women in labour:- Intrapartum CTG interpretation is based on FIGO classification (see labour ward guideline)

7

On completion of an intrapartum CTG trace (non STAN), the professional should note the date, time and mode of delivery on trace. It should then be signed with a clear legible signature. The traces are then securely stored within the case notes in a CTG

wallet. The wallet should be identified with the mother's name, case note number and delivery outcome.

Principles for Interpretation of EFM (antenatal setting non labour)

Feature	Baseline	Variability (bpm)	Decelerations	Accelerations
Reassuring	110-160	5	None or Early Variable decelerations with no concerning characteristics for less than 90 minutes	Present
Non-Reassurir	100-109 Or 161-180	< 5 for 30-50 mins Or More than 25 for 15 to 25 minutes	Variable decelerations with no concerning characteristics* for 90 minutes or more OR Variable decelerations with any concerning characteristics* in up to 50% of contractions for 30 minutes or more OR Variable decelerations with any concerning characteristics* in over 50% of contractions for less than 30 minutes OR Late decelerations in over 50% of contractions for less than 30 minutes, with no maternal or fetal clinical risk factors	The absence of accelerations with otherwise normal trace is of uncertain Significance.

			such as vaginal bleeding or significant meconium	
ABNORMAL	<100 >180	<5 for ≥50 minutes OR More than 25 for more than 25 minutes OR Sinusoidal	Variable decelerations with any concerning characteristics* in over 50% of contractions for 30 minutes (or less if any maternal or fetal clinical risk factors OR Late decelerations for 30 minutes (or less if any maternal or fetal clinical risk factors) OR Acute bradycardia, or a single prolonged deceleration lasting 3 minutes or more	

Regard the following as concerning characteristics of variable decelerations: lasting more than 60 seconds; reduced baseline variability within the deceleration; failure to return to baseline; biphasic (W) shape; no shouldering.

Although a baseline fetal heart rate between 100 and 109 beats/minute is a non-reassuring feature, continue usual care if there is normal baseline variability and no variable or late decelerations

There are three **categories** of CTG as described by NICE (2017). These are normal, suspicious and pathological. The following table illustrates the definition of each:

Category	**Definition**
Normal	An FHR trace in which all four features are classified as reassuring.
Suspicious	An FHR trace with one feature classified as non-reassuring and the remaining features classified as reassuring. • Correct any underlying causes, such as hypotension or uterine hyperstimulation • Perform a full set of maternal observations • Start 1 or more conservative measures* • Inform an obstetrician **or** a senior midwife • Document a plan for reviewing the whole clinical picture and the CTG findings Talk to the woman and her birth companion(s) about what is happening and take her preferences into account
Pathological	An FHR trace with two or more features classified as non-reassuring or one or more classified as abnormal.

	• Obtain a review by an obstetrician **and** a senior midwife • Exclude acute events (for example, cord prolapse, suspected placental abruption or suspected uterine rupture) • Correct any underlying causes, such as hypotension or uterine hyperstimulation • Start 1 or more conservative measures • Talk to the woman and her birth companion(s) about what is happening and take her preferences into account • If the cardiotocograph trace is still pathological after implementing conservative measures: • obtain a further review by an obstetrician **and** a senior midwife • offer digital fetal scalp stimulation and document the outcome • If the cardiotocograph trace is still pathological after fetal scalp stimulation: • consider expediting the birth take the woman's preferences into account
Need for urgent intervention	Acute bradycardia, or a single prolonged deceleration for 3 minutes or more • Urgently seek obstetric help • If there has been an acute event (for example, cord prolapse, suspected placental abruption

	or suspected uterine rupture), expedite the birth • Correct any underlying causes, such as hypotension or uterine hyperstimulation • Start 1 or more conservative measures • Make preparations for an urgent birth • Talk to the woman and her birth companion(s) about what is happening and take her preferences into account • Expedite the birth if the acute bradycardia persists for 9 minutes If the fetal heart rate recovers at any time up to 9 minutes, reassess any decision to expedite the birth, in discussion with the woman

Assessing the WHOLE clinical picture

In addition to interpreting the CTG and categorising it using the NICE (2017) definitions, it is also essential to consider the whole clinical picture.

Maternal observations should be noted; maternal pulse, blood pressure, respiratory rate and temperature. Any deviation from the norm and in particular maternal Pyrexia (38.0C or above on one occasion or 37.5C or above on two or more occasions two hours apart) should be noted and communicated to the obstetric team.

Audit

Compliance with the guideline will be audited on an annual basis by supervisors of Midwives

Education and training

- All midwives and obstetricians providing intrapartum care will attend an annual whole day or equivalent 6 hours teaching seminar on fetal physiology in labour, discussion of the principles underlying intermittent auscultation, CTG interpretation (and STAN) together with an understanding of the maternal and fetal risk factors. This will include maternal and co-morbidities, pyrexia, infection, fetal growth restriction, prematurity and the significance of meconium. This seminar should allow for discussion of clinical cases

- All obstetric units must provide a weekly clinical meeting for the multi-professional discussion of clinical cases involving CTG (or STAN) interpretation.

- Whenever possible intrapartum fetal surveillance training must be multi-professional. It must be delivered within a culture of respect and awareness of undermining behaviours and promote a positive and supportive atmosphere within the maternity setting. It should also encourage the principles of assertive communication and include a discussion about escalation and the use of multi-professional discussions, including safety huddles and a fresh eyes approach

References

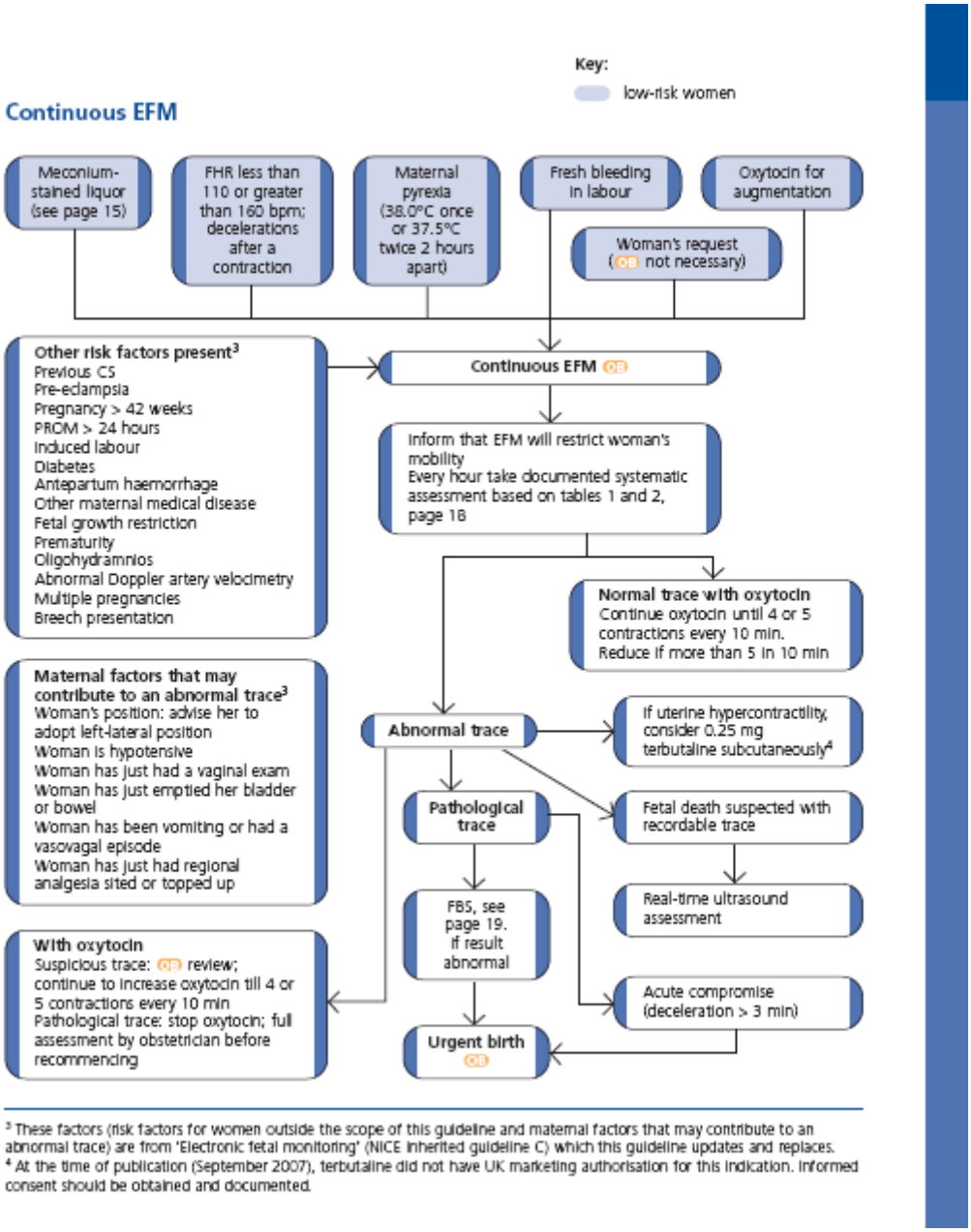
Alfirevic Z, Devane D, Gyte GML (2007) "Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for assessment during labour (review)" The Cochrane Collaboration. http://www.thecochranelibrary.com

National Institute for Clinical Excellence (2007) Intrapartum Care: Care of healthy women and their babies during childbirth London RCOG Press.

Gibb D and Arulkumaran S (2008), "Fetal Monitoring in Practice (Third Ed)". Churchill Livingstone.

Intrapartum care for Healthy women and babies NICE 2017.

Appendix 1



[3] These factors (risk factors for women outside the scope of this guideline and maternal factors that may contribute to an abnormal trace) are from 'Electronic fetal monitoring' (NICE inherited guideline C) which this guideline updates and replaces.
[4] At the time of publication (September 2007), terbutaline did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented.