Fetal Monitoring – Antenatal (including computerised CTG)

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

Introduction

To ensure that ALL medical and midwifery staff of whom are expected to review and interpret CTG traces have completed their Fetal Monitoring/ Mandatory training annually. Study leave must be provided to ensure staff attend/complete mandatory training.

To ensure that there are adequate resources of equipment to enable all types of fetal monitoring to be undertaken.

This guideline is for use by the following staff groups:

Obstetric Medical Staff and Midwives

Lead Clinician(s)

Kate Griffiths	Fetal Monitoring Lead Midwife
Fiona Ross	Consultant Obstetrician - Fetal Monitoring Lead
Approved by *Maternity Governance Meeting* on:	28th February 2025
Approved by Medicines Safety Committee on:	N/A
Review Date: This is the most current document and should be used until a revised version is in place	28TH February 2028

Key amendments to this guideline

Date	Amendment	Approved by:
June 2023	Review in line with new NICE guidance & physiological CTG interpretation.	MGM
February 2025	Review to clarify computerised CTG should not be commenced following start of IOL. Updated to include all pregnancies requiring CTG from 26 weeks.	MGM

Ockenden Maternity Guidelines Assessment

Is there National Guidance Available for this guideline?	NICE [NG201] Antenatal Guideline NICE [NG229] Fetal monitoring in labour NICE [NG207] Inducing Labour
National Guidance used to inform guideline *e.g. NICE/RCOG*	All of the above guidelines are utilised in the creation of this document.
Does the guideline follow National Guidance if available? *If no, what rationale has been used.*	Yes
If no national guidance available or national guidance not followed, what evidence has been used to inform guideline.	Dawes redman – *'DR-cCTG can be used before the first vaginal prostaglandin is given providing there is no coordinated uterine activity. A post vaginal prostaglandin DR-CTG can be performed provided there is no uterine activity of any description.'* Dawes-Redman+and++Uterine+Activity.pdf **As a group, we have decided that the definition of uterine activity can be subjective to both professional and birthing person. Therefore, the decision was made to cease use of Non-Stress Test following commencement of IOL.** The recommendation for Non-Stress Test CTG from 26 weeks of gestation brings us in line with other regional trusts and Dawes Redman recommendations. Dawes-Redman
Ratified at Maternity Guidelines Forum:	28/02/2023 (MGM)

Contents

Introduction

Continuous electronic fetal monitoring (CEFM) is recording of the fetal heart rate obtained via an ultrasound transducer placed on the mother's abdomen and was introduced as a tool to reduce perinatal mortality and cerebral palsy. Evidence does not support the use of CEFM for fetal assessment in women with an uncomplicated pregnancy and therefore it should not be offered to these women (NICE 2008). For women who are considered low risk, the appropriate method of fetal heart monitoring during the antenatal period is either a hand held Doppler device and/or Pinard. CTG is widely used in pregnancy as a method of assessing fetal well-being, predominantly in pregnancies with increased risk of complications. The antenatal CTG is essentially a screening test for fetal well-being as an abnormal Antenatal CTG may lead to a range of further actions which may include further testing, hospital admission, or delivery.

Aims and Objectives

To identify fetus' at risk of intrauterine hypoxia and acidaemia and to provide timely, appropriate intervention to avoid fetal neurological damage or death.

To ensure that all Medical and Midwifery staff provide safe care to women during the antenatal period including Induction of Labour.

To ensure that the correct identified group of women receive CEFM.

To ensure that the maternal pulse is palpated, and the fetal heart is auscultated at the commencement of the CTG for 60 seconds.

To ensure that the CTG is reviewed systematically every 20 minutes if it is being continued.

To ensure that the correct actions are undertaken when a CTG is identified as abnormal.

To ensure that CTG recordings/ reviews are securely documented in the medical records.

Definitions

CEFM – Continuous Electronic Fetal Monitoring
FHR – Fetal Heart Rate
CTG – Cardiotocograph
DR- Dawes-Redman
STV- Short term variation

Indications for Antenatal CEFM:

- Reduced fetal movements (RFM)
- Intrauterine fetal growth restriction (IUGR)
- Antepartum haemorrhage (APH)
- Abdominal pain/ suspected abruption
- Hypertension or pre-eclampsia
- Maternal accident or trauma to abdomen
- Poor obstetric history
- Maternal diabetes

NB. This list is not exhaustive, if any obstetric concerns, a CTG should be undertaken and discussed with a senior registrar or consultant obstetrician.

The FHR should always be auscultated with a Pinard or handheld Doppler prior to the CTG and recorded with the mother's pulse rate to avoid recording the maternal heart rate in the case of intrauterine fetal death.

A CTG should not be interpreted in isolation, the clinical situation must always be considered, taking into account risk factors and examination findings.

Parameters

For a reassuring Antenatal CTG trace:

- Accelerations present
- Baseline between 110 –160 bpm
- Variability >5bpm
- No decelerations
- No uterine activity

All of the above should be commented on and documented in the notes.

If the CTG is reassuring, the fundal height measurement indicates normal growth, fetal movements are reported as normal and there are no associated complaints, the woman can be reassured and the original plan of care followed.

If reports of reduced fetal movements are made, the policy for "Reduced Fetal Movements" should be adhered to.

If the CTG is abnormal the Obstetric team should be asked to review the patient urgently.

Prior to 26 weeks gestation a CTG should not be performed, and auscultation of fetal heart should be undertaken with either Sonicaid or Pinard.

Computerised CTG

Computerised CTG is an expert assistant for CTG interpretation however the final clinical judgement should be based on the entire clinical assessment.

A Non Stress Test (NST)/ computerised CTG analysis should be used when interpreting AN CTGs unless it is contraindicated. Such as suspected labour or when an induction of labour has been commenced.

Computerised CTG analysis should be offered for women with reduced fetal movements from 26 Weeks.

A 'criteria met' conclusion is determined by a number of parameters set within the Computerised CTG system with the minimum analysis duration of trace set at 10 minutes.

If, however, criteria has not been met by the end of one hour (60 minutes) the trace would state that the criteria had not been met.

This would then trigger an escalation for an obstetric review and a repeat Computerised CTG.

In the case of a pathological CTG 60 mins is not needed to determine the criteria would not be met and immediate escalation is required.

The Computerised CTG analysis should not be used under 26 weeks gestation and must **NOT** be used for intrapartum CTG analysis or when induction of labour has been commenced.

Computerised CTG criteria considers the standard features of visual assessment such as accelerations, decelerations and basal heart rate, as well as parameters which are difficult or impossible to measure visually, such as STV, sinusoidal rhythm and the number of minutes of high variation. The CTG is analysed considering:

- STV of 3 minutes or greater
- No evidence of a sinusoidal rhythm
- At least one episode of high variation
- No large or repeated decelerations
- Accelerations and / or fetal movements
- No evidence of a change in baseline
- A normal basal heart rate (if the trace is short).

Procedure for commencing computerised CTG.

1. Note past medical and obstetric history and the progress of the current pregnancy.
2. Enquire about fetal movements.
3. Gain consent for performing an abdominal palpation. Ensure bladder is emptied prior to measuring and plotting SFH on customised growth chart if not measured within the last 2 weeks and consider if growth scan is indicated.
4. Auscultate the fetal heart with a sonicaid or Pinard for 1 minute. If the fetal heart is not heard, a scan must be performed to identify the fetal heart.
5. Commence the CTG and clearly document patient identification and maternal pulse on the CTG sticker.
6. Ask the patient to record any fetal movements whilst on the monitor using the fetal movement button.
7. Start analysis on the machine, ensuring to insert the correct gestation into the monitor and print the trace.
8. Paper copies of CTG traces should be filed in the patients notes to ensure they are able to be scanned in appropriately.
9. Computerised CTG Analysis should be documented clearly on Badgernet, and if criteria has not been met, the reasons why should be commented on.

Meeting Computerised CTG criteria

The Computerised CTG monitor will report 'Criteria Not Met' when there is insufficient evidence of normality, and the monitoring should be continued. If the criteria has not met at 60 minutes, the reasons will be listed numerically on the printout (Appendix 1). See appendix 2 for management algorithm.

Short term variation (STV) is a predictor of fetal well-being (Appendix 3) however is not the only predictor and the whole clinical picture should be considered. STV is not calculated until 60 minutes and therefore providing the CTG is **NOT** pathological, Computerised CTG should be left for the full 60 minutes if not meeting criteria in order to calculate the STV correctly.

If the CTG is Pathological, there should be **NO** delay and Obstetric team to review immediately. If the criteria is not met after 60 minutes, the action depends on the STV, gestation, whether or not a sinusoidal rhythm is present and the presence of fetal movements.

- If STV is >4.0 the Fetus is unlikely to be hypoxemic and other clinical aspects of the case should be considered.
- If STV is between 3.0 and 3.99 repeat the CTG in 2 hours and notify Obstetric team (if at Kidderminster or Redditch, transfer to Worcester). Ultrasound scan for growth, liquor volume and Doppler may be indicated. CTG should continue if there are any other concerning factors.
- If STV is <3.0, this is a pre-terminal trace, and the Obstetric team should be notified immediately, and the patient should be prepared for delivery. With an STV of <3, there is a high probability of metabolic acidosis and asphyxia.
  For patients in Kidderminster or Redditch, a call to 999 should be made and a request for a "time critical ambulance transfer".
- If a sinusoidal rhythm is present, notify Senior Registrar or Obstetric Consultant urgently.

The CTG monitoring can be discontinued once the Computerised CTG criteria are met and plan of care followed.

CTG/Computerised CTG monitoring does **NOT** replace clinical judgement, therefore if there are any other associated signs, symptoms or concerns, despite Computerised CTG criteria being met, the obstetric team should be informed.

If the Computerised CTG system is not available, the CTG should continue for 20-40 minutes and providing good variability, present accelerations, a normal stable baseline and no decelerations.

The CTG if reviewed and deemed normal can be discontinued; this should be agreed and signed by 2 registered midwives and documented clearly in the notes.

If the CTG has any abnormal features, an urgent review by Senior Registrar or Obstetric Consultant is required.

Induction Of Labour

An NST assessment should not be used once IOL has been commenced. This is in line with NICE guidelines due to the inaccuracy in NST in the presence of uterine activity, whether it is felt or not.

Possible error at end of the record

This occurs when the machine detects a possible abnormality at the end of the trace which would otherwise be passed as criteria met.

In this event the trace should be continued or acted upon appropriately regards to the clinical evaluation.

High frequency sinusoidal rhythm

Sinusoidal patterns are associated with either severe fetal anaemia or severe fetal hypoxia with acidosis and are associated with poor fetal outcomes. Where a diagnosis of Sinusoidal FHR pattern is made, immediate intervention is required with probable emergency delivery if intrauterine resuscitation is not appropriate.

No accelerations

If no accelerations are present in an antenatal CTG, the trace should be continued and be reviewed by a senior registrar or Obstetric consultant. (Computerised CTG analyses uses a lower threshold of >10bpm for an acceleration compared to NICE definitions).

Antenatal CTG Fresh Eyes

All Antenatal CTG's should be printed and on completion be analysed and signed by another midwife or obstetrician so fresh eyes has seen the trace, If it is agreed that the CTG meets the normal parameters of an Antenatal CTG.

How often CTG traces should be performed antenatally.

See the table below for intensity of necessary CTG monitoring for antenatal induction patients prior to the onset of labour.

Please note, the whole clinical situation should be taken into account and if there is any uncertainty or concerns in regard to the regularity of fetal monitoring, the obstetric team should be consulted.

For inpatients not requiring induction, an individualised plan should be made as part of their plan of care and the relevant table below should be used as a guide to determine CTG frequency.

Daily CTG	Twice daily CTG
Routine post-dates	Growth <10th centile/Static growth on USS
Diet control GDM with normal size baby	Preterm <37/40
Maternal request	Post dates
Maternal age	Elevated PI but normal EDF
Pelvic girdle dysfunction	Reduced fetal movements
Large for dates	PET/PIH
Polyhydramnios	SROM <37/40
	Oligohydramnios
	DCDA twins
	Diabetics on metformin or insulin
	Obstetric Cholestasis
	History of Antepartum haemorrhage resulting in decision for IOL– not actively bleeding

APPENDIX 1: Computerised CTG Numerical Codes

Code	Reason criteria not met
1	Basal heart rate outside normal range
2	Large decelerations
3	No episodes of high variation
4	No movements and fewer than 3 accelerations
5	Baseline fitting is uncertain
6	Short-term variation is less than 3 ms
7	Possible error at the end of the record
8	Decelerations at the end of the record
9	High-frequency sinusoidal rhythm
10	Suspected sinusoidal rhythm
11	Long-term variations in high episodes below acceptable level
12	No accelerations

Monitoring

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the Policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)*	Frequency of reporting:
	WHAT?	**HOW?**	**WHEN?**	**WHO?**	**WHERE?**	**WHEN?**
	Reduced Fetal Movements – RFM from 26 weeks	SBL Audits	Quarterly	SBL Midwife	Governance & LMNS	Quarterly

Contribution List

This key document has been circulated to the following individuals for consultation;

Designation
Maternity Governance Meeting
Maternity Guidelines Committee

This key document has been circulated to the chair(s) of the following committee's / groups for comments;

Committee
Maternity Quality Governance Meeting