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TRUST CLINICAL GUIDELINE

Antenatal Fetal Heart Monitoring

Overview

This guideline covers methods for antenatal heart rate monitoring and includes interpreting and acting on monitoring findings.

Owner	S. Adamson
Author/further information	Fetal Wellbeing Midwives
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Related protocols/procedures	**SRH&WH:** Antenatal care & patient information **PRH&RSCH:** Antenatal schedule of care **UHSx:** Fetal Monitoring INTRAPARTUM,
Standards	
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Contents

Fetal Monitoring Guideline

1.0 Introduction

This guideline covers methods for antenatal heart rate monitoring. It includes interpreting and acting on monitoring findings.

In pregnancy, antenatal monitoring of the fetal heart (FH) through cardiotogography (CTG) or auscultation is not routinely clinically indicated. Assessment of fetal wellbeing throughout pregnancy is primarily conducted through monitoring of fetal growth either by SFH or USS, and the woman or birthing person awareness of fetal movements, rather than auscultation of the fetal heart (see SGA/FGR and Reduced fetal movements guidelines).

2.0 Scope

This guideline applies to the following:

- Midwives
- Obstetricians

3.0 Responsibilities

Midwives & obstetricians:

- To access, read, understand and follow this guidance.
- To use their professional judgement in application of this guideline.

Management:

- To ensure the guideline is reviewed as required in line with Trust and National recommendations.
- To ensure the guideline is accessible to all relevant staff.

4.0 Definitions and abbreviations used within this guideline

BPM Beats per minute	**cCTG** Computerised Cardiotocograph
CTG Cardiotocograph	**DAU** Day assessment unit
DR Dawes Redman	**FGR** Fetal growth restriction
FHR Fetal heart rate/ FH Fetal heart	**IA** Intermittent auscultation
IOL Induction of Labour	**RFM** Reduced fetal movements
SGA Small for gestational age	**STV** Short term variation

5.0 General principles: Intermittent auscultation using a Pinard or handheld Doppler device (Sonicaid)

Fetal heart auscultation may be requested from 16 weeks gestation. The FHR should be auscultated using a Pinard or Sonicaid Doppler for one minute and reported as a single figure e.g. 144 bpm. Normal fetal heart rate on auscultation is between 110 and 160 bpm.

The fetal heart should be auscultated:

- As part of the BSOTs initial assessment on attendance to maternity triage.
- For reassurance and to enhance maternal-fetal attachment as part of antenatal appointments if desired by the woman or birthing person (Bonnén et al., 2023).
- Before and after vaginal examinations, including membrane sweeps.
- 4 hourly if admitted during latent phase (see maternity guidance on Latent phase).
- As part of routine monitoring of antenatal inpatients on maternity wards. Frequency of auscultation should be agreed by the admitting resident doctor (ST3 or above).

5.1 Actions if abnormalities detected during antenatal auscultation

If any abnormalities are detected (e.g. low or high fetal heart rate or any decelerations):

In community -

- Refer into MAU.

If any urgent concerns e.g. fetal bradycardia suspected, an ambulance should be considered for prompt transfer.

In MAU/inpatient -

- If 26 weeks or more commence CTG.
- If less than 26 weeks refer to on-call resident doctor (ST3 or above).
- If FH undetected, the on-call resident doctor (ST3 or above) should be informed and a bedside USS performed to confirm viability as soon as possible.

6.0 General principles: Antenatal CTG

For effective clinical decision-making, a full clinical risk assessment is required for both visual CTG and computerised CTG. Clinical decisions should be based on a full clinical assessment and CTG should not be used in isolation for decision-making. It only provides information about fetal condition at the time of recording, and it is not a predictive tool.

For a woman or birthing person without identified risk factors, CTG monitoring is not indicated and should not be employed.

Before commencing a CTG with either a visual or computerised assessment, ensure an in-depth medical and obstetric history has been obtained and documented looking at the whole clinical situation, including completion of risk assessment and the rationale for performing the CTG and gestational age.

Explain to the woman or birthing person:

- The reasons of performing a CTG.
- The benefits, risks and limitations of CTGs.
- That they will be included in discussions and plans regarding their care.

If the woman or birthing person declines monitoring, discuss her reasons/concerns and document in Badgernet Maternity.

See appendix 1 for how to set up a CTG/cCTG.

CTG analysis should be recorded on the appropriate forms on BadgerNet Maternity.

6.1 Computerised CTG- Dawes Redman (DR) Analysis

Saving Babies' Lives version 3 recommends the use of antenatal computerised CTG, as human error in antenatal visual CTG interpretation has been identified as a significant cause of stillbirth and serious brain injury (NHS England, 2025). It has also been shown to reduce perinatal mortality when compared with visual CTG interpretation (Grivell et al., 2015). Computerised CTGs should be used wherever possible when a CTG is indicated.

Dawes-Redman is an 'expert assistant'; however, it also requires robust clinical judgement and confirmation. A visual inspection of the CTG by the practitioner must always be performed to confirm the CTG analysis before discontinuing.

cCTG can be used:

- From 26 weeks gestation
- In singleton and twin pregnancies (but not higher order multiples)
- In the absence of painful and palpable contractions. If previous uterine activity (e.g. contractions) indicative of labour has been observed within the same clinical presentation or visit of the patient, DR cCTG should not be used, even if no uterine activity is currently occurring (Redman et al., 2023).
- As part of induction of labour:
  - 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.
  - DR cCTG can be used before or after a 'stretch and sweep' procedure provided there are no signs of latent or early labour. This also applies to mechanical (non-pharmacological) methods of cervical dilatation including balloon catheters

Dawes Redman analysis should not be used after second or subsequent prostaglandins for induction of labour (Redman et al., 2023).

Dawes-Redman criteria can be found in appendix 2. The first result is calculated after 10 minutes and is updated every 2 minutes up to 60 minutes.

There are 2 possible outcomes:

- Criteria met
- Criteria not met

6.1.1 Criteria met

The DR criteria can meet in as little as ten minutes.

- Once the DR criteria have been met, the practitioner should perform a visual analysis and classify the cCTG as normal or abnormal (see section 7.2).
- If the cCTG is visually normal, and there are no clinical concerns, the cCTG can be discontinued.
- If DR criteria is met, but on visual inspection there are concerns about the normality of the cCTG, an obstetric review should be sought.
- If criteria are met but there are clinical concerns, an obstetric review should be sought.

6.1.2 Criteria not met (before 60 minutes)

- If the DR criteria are not met the cCTG should continue for the full 60 minutes.
- The reason for criteria not meeting can be seen by rolling over the analysis.
- If there are abnormal features or any cause for concern during this time, immediate escalation should take place.

6.1.3 Criteria not met (at 60 minutes)

See appendix 3 for guidance on suggested management if DR criteria are not met.

Once a full 60 minutes has been completed, the computerised analysis will be available. This will include the reason(s) that DR criteria were not met.

- If the DR criteria are not met at 60 minutes, the practitioner should perform a visual analysis and classify the CTG as normal or abnormal (see section 7.2).
- The DR results should be reviewed. This should include a review of the STV value (see section 7.1.4) and comparison to previous values.
- Escalate to the resident doctor (ST3 or above) and inform the labour ward coordinator.
- Clinical judgement should be used to determine if the CTG should continue while awaiting review or can be discontinued.

6.1.4 Short term variation (STV)

STV is a computerised measure of the micro fluctuations of the fetal heart, invisible to the human eye. In healthy fetuses, STV increases with gestational age. A low STV, if transient, is an expected part of the sleep cycle of healthy fetuses therefore STV is invalid before 60 minutes.

A sustained low STV is most commonly associated with fetal growth restriction and chronic hypoxia. An STV of less than 3ms should be escalated and reviewed immediately by the resident doctor ST3 or above (Redman et al, nd).

STV (ms) ***at 60 minutes when DR criteria are not met***	**Interpretation**
4.0 and above	The fetus is **not** hypoxic or acidotic, but may still have another serious problem
3.0 – 3.9	The fetus may be stressed but is **not** distressed by acidosis
Less than 3.0	High probability of metabolic acidosis and asphyxia

Table 1: STV values and interpretation (Redman et al., n.d.)

In fetal growth restriction, STV values may be used to support clinical decision making for timings of delivery. Different thresholds for STV based on the TRUFFLE study should be used for these babies. See SGA/FGR guideline.

6.2 Non-computerised CTG

- The full holistic picture including indication for CTG, risk factors and gestational age should be considered.
- A systematic assessment of the four main features; baseline rate, variability, accelerations and decelerations should be undertaken (Table 2).
- The CTG trace should be continued for at least 20 minutes, all features should be normal by 40 minutes.
- Oral or intravenous fluids are not recommended to improve the CTG unless clinically indicated, e.g. dehydration.

If cCTG is not indicated, visual interpretation of the CTG is required. The following criteria are used to classify an antenatal CTG:

Feature	Reassuring	Non-Reassuring
Baseline (bpm)	110 – 160	Less than 110 or more than 160
Variability (bpm)	5 or more	Less than 5 for over 40 minutes
Accelerations	Present	None for 40 minutes
Decelerations	None	Unprovoked decelerations or decelerations relating to contractions (not in labour)

Table 2: Categorisation of Antenatal CTG features

CTG should be classified as:

- **Normal**- if all four features are reassuring.
- **Abnormal**- one or more non-reassuring features.

If a CTG is visibly abnormal, an obstetric review (ST3 or above) is required, and continuous monitoring should be continued on labour ward.

6.3 Frequency of Fetal Monitoring for Antenatal Inpatient Admissions

- There should be a clear and comprehensively documented clinical indication to perform a (c)CTG.
- Holistic review of the clinical picture and the baby's wellbeing should indicate the necessity and frequency of monitoring. The frequency of CTG monitoring should reflect the level of risk to the fetus, and the indication and frequency of CTG monitoring should be agreed by the admitting resident doctor (ST3 or above) and documented in the Obstetric Care Plan.
- If continuous antenatal CTG is indicated, this must be conducted on labour ward where 1:1 care can be facilitated. Indications for continuous antenatal CTG are few and should be discussed with the on-call consultant. Continuous CTG should not be used as a default response to a concerning trace; instead, consideration of expediting delivery should form part of that discussion. The CTG should be peer reviewed at least hourly.
- Fetal heart monitoring should not be routinely offered to pregnant women or birthing people admitted to hospital as a medical outlier unless there are concerns regarding fetal wellbeing that may require obstetric input.

6.3.1 Monitoring during induction of labour

- During induction of labour CTG monitoring should be used as part of the assessment of fetal wellbeing. A CTG should be undertaken pre and post the initial induction method.

- Clinical judgement should be used on whether to use antenatal or intrapartum CTG classification during the IOL process. The presence of painful and palpable contractions indicates use of an intrapartum CTG classification (see Fetal Monitoring INTRAPARTUM guideline), even without established labour.
- Returning outpatients undergoing IOL should be assessed on an individual basis and CTG commenced only if there are concerns regarding the maternal or birthing person, or fetal wellbeing

7.0 Monitoring

Issue being monitored	**Monitoring method**	**Responsibility**	**Frequency**	**Reviewed by and actions arising followed up by**
Incidents relating to antenatal fetal monitoring	Case review & DATIX	Fetal Wellbeing Midwives & Patient Safety Midwives	On-going	Actions are owned by Fetal Wellbeing Midwives

Appendix 1: Setting up a CTG

1. If provided, ensure the Ethernet cable is inserted into the moxibox assigned to the room/bed/assessment space.

2. Turn on the machine.

3. Ensure the date and time are correct on the machine, and adequate paper is available. If using the printer, it must be set to run at 1cm per minute.

4. Input patient name, hospital number (or NHS number) and gestational age. Use the scan EDD. DO NOT use LMP.

5. Manually palpate the maternal radial pulse to differentiate between fetal heart and maternal heart rates and document on trace. If differentiating is difficult, ensure maternal pulse is recording on the trace by applying the pulse oximeter probe.

6. Perform a full abdominal palpation and auscultate FHR by sonic aid or pinard before commencing the CTG to confirm fetal heart rate sounds.

7. Position the toco and ultrasound transducers. Dawes Redman Criteria cannot be met with >10% loss of contact – therefore reposition transducers if contact is poor.

8. Press the ‘print’ icon to commence the trace for a paper copy.

9. Ensure the correct patient details and gestation are input to the corresponding room/bed/assessment space on SonicCentrale.

10. For cCTG: Connect the fetal movement button and show the woman or birthing person how to use it. Fetal movements will only be registered if the fetal movement button is pressed, as the automatic fetal movement detection function should be disabled. It is imperative that women and birthing people are informed as to the importance of using this button. This function is not suitable for use on multiples.

11. For cCTG: If available, commence DR analysis via SonicCentrale ensuring the correct patient details and gestation are input to the corresponding room/bed/assessment space. If SonicCentrale is not available in the patient’s room/bed/assessment space, run DR analysis on the machine by selecting the DR criteria through the settings button and pressing print. At the end of the trace press ‘print’ to print the DR analysis. See appendix 2 Dawes Redman Criteria.

Appendix 2: Dawes Redman Criteria

Signal loss (%)	The percentage of the trace for which there was no fetal heart rate recorded. Signal loss is usually due to poor transducer positioning or fetal movement. Reposition the transducer to get the best possible signal, ensuring plenty of gel is used. If the signal loss is >50% during accelerations or large decelerations, these will not be included in the analysis results.
Contractions	The software registers a contraction if there is a rise of 16% or more, lasting for 30 seconds or more, from the resting 'zero' line.
Movements	Simply counts fetal movements recorded by the mother. Note that this will always be shown as zero for twins monitoring, as it is not possible to tell which fetus is moving.
Basal Heart Rate (bpm)	This is the average rate measured normally during periods of low variation. On very reactive traces it is assessed by a 'best fit' method. It is similar to visually assessed baseline rate (BLR) but may differ with some trace patterns (eg. very reactive, large decelerations, etc.). Users should always visually assess BLR independently from the analysis.
Accelerations	A rise from the BLR of 10bpm or more, lasting 15 seconds or more. Research has shown that a small percentage (5-8%) of traces without accelerations are in fact normal. It is not therefore essential to have accelerations present for the trace to be interpreted as normal. This is particularly true pre-30 weeks gestation.
Decelerations	A fall from the BLR of at least 10bpm, lasting 60s or more, with >5 'lost beats', or a decrease of 20bpm lasting 30 seconds or more, with >5 'lost beats'. See below for definition of 'lost beats'.
High Episodes	This is a measure of how reactive the trace is. Rather than relying on accelerations (see above), this measures the amount of time the change from one beat to the next exceeds a certain level. It can be interpreted as the period of time, during the trace, over which the FHR was highly reactive.
Lost Beats	'Lost beats' are a measure of the area or 'size' of the deceleration. To understand this, consider a trace with a baseline rate of 120bpm with a 1 minute deceleration. If the heart rate had stayed at the baseline rate for this period, instead of decelerating, there would have been 120 heart beats in the one minute. Because of the deceleration, the FHR slowed down and there were actually only, say, 80 beats during the one minute. This means it 'lost' (120-80 =) 40 beats – this is how DR measures decelerations, in 'Lost beats'. Lost beats is simply the 'size' of the largest deceleration.
Short Term Variation (STV) (ms)	This is a form of 'variability' or 'baseline variation'. Traditionally, variability is assessed visually as the difference between the highest & lowest rates in a 1 minute period during a quiescent period (ie. no accelerations or decelerations). Short Term Variation (STV) is essentially the same, but measured over a much shorter time period than can be done visually (3.75s). It is measured in milliseconds rather than bpm. This is the time between beats, rather than the number of beats per minute – just a different way of measuring heart beats. In non-reactive traces, STV has been shown to correlate highly with the development of metabolic hypoxaemia and intrauterine death. If there is a consistent downward trend in STV towards or below 3ms over period of days or weeks, delivery may need to be expedited.

Appendix 3: Suggested management when DR criteria not met

This table provides guidance on suggested actions when DR criteria are not met. This list is not exhaustive. Clinical judgement including full holistic review should be used when formulating a plan with women and birthing people.

Code	Reason criteria not met	Suggested action
1	**Basal Heart Rate outside normal range (110-160bpm)**	• Discuss with senior obstetrician (ST3 or above), further assessment of fetal wellbeing or delivery depending on clinical picture. • Inform senior midwife/co-ordinator.
2	**Large decelerations**	• If the trace is otherwise normal and has one or two isolated decelerations, repeat the trace in 2-4 hours. • For recurrent decelerations inform senior obstetrician (ST3 or above). • Inform senior midwife/co-ordinator. • Consider delivery.
3	**No episodes of high variation**	• If STV is normal and there are accelerations, CTG can be discontinued and repeated within 4 hours. • Absence of an episode of high variation is strongly linked to development of metabolic acidaemia. This should be acted upon in the same way as a reduced STV.
4	**No movements and fewer than 3 accelerations**	• Requires obstetric review. • Inform senior midwife/co-ordinator. • Repeat CTG within 4 hours.
5	**Baseline fitting is uncertain**	• If all else is fine and the baseline falls within normal parameters then this can be ignored. **or** • If concerned repeat within 4 hours.
6	**STV is less than 3**	• Inform senior obstetrician (ST3 or above). • Inform senior midwife/co-ordinator. • Consider delivery.
7	**Possible error at the end of record**	• Continue CTG. • Repeat CTG within 4 hours.
8	**Deceleration at the end of the record**	• Inform senior obstetrician (ST3 or above). • Inform senior midwife/co-ordinator. • Consider delivery or appropriate action based on clinical picture. • Continue or repeat CTG as required.
9	**High-frequency sinusoidal rhythm**	• Discuss with senior obstetrician (ST3 or above) • Inform senior midwife/co-ordinator. • Consider immediate delivery. • Inform Neonatal Team

		• Maternal blood for Kleihauer to test for degree of feto-maternal haemorrhage and consider risk of fetal anaemia.
10	**Suspected sinusoidal rhythm**	• Discuss with senior obstetrician (ST3 or above) • Inform senior midwife/co-ordinator. • Differentiate from pseudo sinusoidal rhythm, if sinusoidal, manage as per sinusoidal. • Pseudosinusoidal FHR patterns closely resemble a sinusoidal pattern, but are usually transient, resolve spontaneously and are associated with a good fetal outcome.
11	**Long term variations in high episodes below acceptable levels**	• Discuss management plan with senior obstetrician (ST3 or above). • Inform senior midwife/co-ordinator. • Repeat CTG in 4 hours. • Absence of an episode of high variation is strongly linked to development of metabolic acidaemia. This should be acted upon in the same way as a reduced STV.
12	**No accelerations**	• Review by senior obstetrician (ST3 or above). • Inform senior midwife/co-ordinator. • Continue CTG or repeat within 4 hours.

Guideline Version Control Log

Version	Date	Author	Comment
1.0	September 2025	Fetal Wellbeing Midwives	New Trust wide guideline replacing: • CG1116 Fetal heart monitoring (inc FBS) (SRH&WH) • MP037 Fetal heart monitoring (PRH&RSCH)

Due Regard Assessment Tool

To be completed and attached to any guideline when submitted to the appropriate committee for consideration and approval.

		Yes/No	Comments
1.	**Does the document/guidance affect one group less or more favourably than another on the basis of:**		
	Age	*No*	
	· Disability	*No*	
	· Gender (Sex)	*No*	
	· Gender Identity	*No*	
	· Marriage and civil partnership	*No*	
	· Pregnancy and maternity	*No*	
	· Race (ethnicity, nationality, colour)	*No*	
	· Religion or Belief	*No*	
	· Sexual orientation, including lesbian, gay and bisexual people	*No*	
2.	**Is there any evidence that some groups are affected differently and what is/are the evidence source(s)?**	*No*	
3.	**If you have identified potential discrimination, are there any exceptions valid, legal and/or justifiable?**	*NA*	
4.	**Is the impact of the document likely to be negative?**	*No*	
5.	**If so, can the impact be avoided?**	*NA*	
6.	**What alternative is there to achieving the intent of the document without the impact?**	*NA*	
7.	**Can we reduce the impact by taking different action and, if not, what, if any, are the reasons why the guideline should continue in its current form?**	*NA*	
8.	**Has the document been assessed to ensure service users, staff and other stakeholders are treated in line with Human Rights FREDA principles (fairness, respect, equality, dignity and autonomy)?**	*Yes*	

If you have identified a potential discriminatory impact of this guideline, please refer it to [Insert Name], together with any suggestions as to the action required to avoid/reduce this impact. For advice in respect of answering the above questions, please contact uhsussex.equality@nhs.net 01273 664685).

Template Dissemination, Implementation and Access Plan

To be completed and attached to any guideline when submitted to Corporate Governance for consideration and TMB approval.

	Dissemination Plan	**Comments**
1.	Identify:	
	Which members of staff or staff groups will be affected by this guideline?	Midwives and obstetricians
	How will you confirm that they have received the guideline and understood its implications?	Dissemination through the usual communication channels and highlighted at Safety Huddles.
	How have you linked the dissemination of the guideline with induction training, continuous professional development, and clinical supervision as appropriate?	All new members of staff are shown where to access Clinical documents that are relevant to their area of practice.
2.	How and where will staff access the document (at operational level)?	Accessed by staff via Sharepoint.

		Yes/No	**Comments**
3.	Have you made any plans to remove old versions of the guideline or related documents from circulation?	Yes	Previous versions will be archived as part of the uploading onto sharepoint process.
4.	Have you ensured staff are aware the document is logged on the organisation's register?	Yes	Dissemination plan includes notifying staff via email, departmental noticeboards, and safety huddles.

Additional guidance and information

Bonnén, K. B., Offersen, S. M. H., Høstrup, L. H., & Maimburg, R. D. (2023). Abdominal examination during pregnancy may enhance relationships between midwife, mother and child: a qualitative study of pregnant women's experiences. *BMC Pregnancy and Childbirth*, *23*(1). https://doi.org/10.1186/s12884-023-05392-0

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NHS England. (2025). *Saving babies' lives: version 3*. https://www.england.nhs.uk/long-read/saving-babies-lives-version-3-2/

Redman, C., Vatish, M., & Albert, B. (n.d.). *STV (Short Term Variation)*. Retrieved June 17, 2025, from https://www.dawes-redman.com/resources

Redman, C., Vatish, M., Davis Jones, G., & Albert, B. (2023). *Use of the Oxford Dawes-Redman computerised CTG analysis system around labour*.